2017

Beyond Breastfeeding: Exploring the Influence of Maternal Control Over Child Health Behavior Among African American Women Infants and Children Nutritional Supplementation Program Participants

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2017

Abstract

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MPH, University of Kentucky, 2011

BA, University of Miami, 2008

Dissertation Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Philosophy

Public Health

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Abstract

The health benefits of breastfeeding exceed well beyond the first few years of an infant's life. Breast milk is often referred to as liquid gold because of its extensive protective properties that promote child growth and development. Unfortunately, African American women have the lowest breastfeeding rates compared to any other racial group. Given that African American children are disproportionately affected by the current obesity epidemic in the United States, there may be a link between a mother's preference to breastfeed her infant and her influence over her child's eating behaviors and physical activity levels. Guided by social cognitive theory, the purpose of this quantitative longitudinal study was to explore the association between exclusive breastfeeding and maternal control over childhood nutrition and physical activity among African American women and children enrolled in the Women Infants and Children Nutritional Supplementation Program (WIC). Secondary data were used from the Infant Feeding Practices II Survey and its Year 6 Follow Up. Crosstabulations were performed to assess the relationship between exclusive breastfeeding and maternal control over child health behaviors after 6 years. The null hypotheses were not rejected, as there was no relationship between exclusive breastfeeding and maternal control over physical activity or child eating behaviors. Findings revealed moderate to high levels of maternal control among WIC participants who breastfed for 3 months. This study may lead to positive social change by increasing the number of children who benefit from breast milk and improving childhood nutrition and physical activity, which will ultimately reduce child obesity disparities and promote maternal and child health altogether.

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Dedication

I would like to dedicate this dissertation to my mother for inspiring me and believing in my potential to highlight the importance of motherhood, breastfeeding, and health outcomes. Without her unconditional love, motivational poems, and hand written notes I would not have had the strength to persevere and reach this milestone accomplishment. She has mastered the intricacies of motherhood and I only hope to be a promising reflection of her hard work. She has always had my back; and for that, I am forever grateful.

This dissertation was written for any mother who has made sacrifices for the health and wellbeing of her children.

Acknowledgments

I would like to thank my committee members, Dr. Loretta Cain, Dr. Gwendolyn Francavillo, and Dr. Ernest Ekong, for their guidance and unwavering support throughout this entire process. I would also like to thank my husband, Sésa Bowman; my mother, Jill Chenault Wilson; and my brother, Obaleggua Wilson for encouraging me and loving me despite my flaws and unfavorable tendencies. I also would like to acknowledge the Centers for Disease Control and Prevention's Infant Feeding Practices Survey and the Year Six Follow Up as it was the primary source of data for this study.

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Chapter 1: Introduction to the Study

Introduction

Breastfeeding is an important facet of public health, and it is imperative for expecting mothers to appreciate the significance of breastfeeding their children within an hour of birth (World Health Organization, 2016). It is recommended that mothers exclusively feed their infants with breast milk for a minimum of 6 months; however, making a conscious effort to breastfeed for a minimum of 2 years is ideal (World Health Organization, 2016). Although a large percentage of women are aware of the importance of infant nutrition, few have been educated about the proper techniques and benefits of breastfeeding (Eni, Phillips-Beck, & Mehta, 2014).

According to the Centers for Disease Control and Prevention (2016a), 81.1% of mothers began to breastfeed their infants in 2014, but only 51.8% and 30.7% continued to breastfeed for 6 and 12 months respectively. Subsequently, the rates for exclusive breastfeeding were somewhat lower, as 44.4% of infants received nothing other than breast milk for 3 months (Centers for Disease Control and Prevention, 2016a). Unfortunately, only 22.3% continued to exclusively breastfeed for the recommended 6 months (Centers for Disease Control and Prevention, 2016a). Breastfeeding rates in the United States fall far below average when compared to other economically-advanced countries, yet it is the only developed country where employers are not mandated to provide paid maternity leave for women who give birth (Save the Children, 2012).

The first 1,000 days of life, beginning from conception until a child's second birthday, are the most important predictors of future health and wellbeing (Save the

Children, 2012). According to the World Health Organization (2011), exclusively breastfeeding for the first 6 months of life is best for all babies. Breast milk has been referred to as liquid gold because of its extensive protective properties that provide nourishment and contribute to growth and cognitive development (Mathur & Dhingra, 2014). Infants who are breastfed have more immunity through immunoglobulin G (IgG) and are therefore less likely to develop infections (Bomer-Norton, 2013; Grzelak, Wozniak, & Czyzewska, 2014). Furthermore, children who are breastfed rarely suffer from upper and lower respiratory tract infections, leukemia, diabetes, and sudden infant death syndrome (Bomer-Norton, 2013; Grzelak et al., 2014; Li, Dee, Ming Li, Hoffman, & Grummer-Strawn, 2014). As a result, breastfed infants tend to require less medical attention and ultimately have superior health outcomes.

Mothers also receive health benefits from breastfeeding in that they are less likely to develop breast and ovarian cancers (American Cancer Society, 2015; Bomer-Norton, 2013; Mathur & Dhingra, 2014; Spencer & Grassley, 2012) or suffer from postpartum depression, diabetes, and excessive weight gain (Mathur & Dhingra, 2014; Save the Children, 2012; Schwarz, 2013; Spencer & Grassley, 2012). More importantly, the bond between a mother and her child is strengthened as the positive interactions that occur during feeding are associated with the release of oxytocin hormones (Bomer-Norton, 2013; Mathur & Dhingra, 2014). Breastfeeding is a natural process that requires minimal effort, yet it is far more cost-effective than formula feeding. Likewise, breastfeeding is also environment-friendly as it serves as a renewable food source that does not require

storage or electrical energy for production (Bomer-Norton, 2013; Save the Children, 2012).

Breastfeeding is a unique practice that benefits all children, regardless of race, gender, or social class (Alipui, 2012), but there is limited promotion for such in the public health sector. Given the extensive health benefits for both mothers and infants, African American women are the least likely to breastfeed compared to any other racial group; only 39.1% of Black women breastfeed for a baby's first 6 months of life compared to 57.9% of White women, and 45.6% of Hispanic women (Centers for Disease Control and Prevention, 2016a). Some researchers have attributed a large percentage of premature maternal deaths and health disparities in the African American community to low breastfeeding initiation and duration (Spencer & Grassley, 2012; Spencer, Wambach, & Domain, 2014). In a recent study, researchers concluded that breastfeeding promotion from healthcare professionals was 15% lower in hospitals where there was a larger population of African American patients (Centers for Disease Control and Prevention, 2014). Low breastfeeding rates among African American women are a national concern, but the same tactics used for this subset of the population could potentially be utilized in other countries where women and children of various races and socioeconomic backgrounds face similar barriers or challenges to breastfeeding.

In this chapter, I will introduce the critical concept of breastfeeding and how it encompasses the need for exploring maternal control over child health behavior. I will also address the background, problem statement, purpose of the study, research questions and hypotheses, theoretical framework, and nature of the study in detail. Not only will

operational definitions, assumptions, delimitations, and limitations be included, but the chapter will conclude with the significance of the study, implications for social change, and a summary.

Background

A mother's decision to breastfeed is one of the first choices she makes for her child postpartum. More often than not, the outcome of this verdict goes on to impact how a mother will choose to feed her child during the most important years of its development. On account of women having the capabilities to produce milk and provide nourishment for their children, mothers also have the greatest influence or jurisdiction over their child's health, which includes nutrition, physical activity, and other related health behaviors, until they are influenced otherwise. As a result, it may be beneficial to use breastfeeding as a focal point for examining issues that disproportionately affect African American children.

The current crisis surrounding childhood obesity may be linked to parental influence and possibly a mother's preference to breastfeed her infant. Based on the current literature, there has yet to be a study that addresses the relationship of these variables in their entirety. Researchers have estimated that over 2.8 million deaths are associated with obesity each year (Yan, Liu, Zhu, Huang, & Wang, 2014). In the United States, one-third of school-age children are overweight or obese with Black children being twice as likely to be obese compared to White and Hispanic children (Dixon, Pena, & Taveras, 2012). Several studies indicated that breastfeeding serves as a protective factor in regard to obesity prevention (Anderson, Hayes, & Chock, 2014; Grube, Lippe,

Schlaud, & Brettschneider, 2015; Jwa, Fujiwara, & Kondo, 2014; Yan et al., 2014), but the implications of obesity can vary throughout the course of a person's life.

Obesity during childhood can lead to diabetes, hypertension, musculoskeletal cancer, cardiovascular disease, and behavioral abnormalities in adulthood (Lefebvre & John, 2014; Moss & Yeaton, 2014; Yan et al., 2014). Considering that children view their parents as role models (Moore & Bailey, 2013) and rely on them to provide and prepare their meals, child eating behaviors are heavily influenced by the child's caretakers (Kelishadi & Azizi-Soleiman, 2014; Moore & Bailey, 2013). Due to a large percentage of women being responsible for preparing meals and feeding their children the majority of the time (Byrd-Bredbenner, Abbot, & Cussler, 2011), the need to examine the concept of maternal control over child health behaviors is warranted.

The concept of maternal control is crucial when teaching children how to eat a well-balanced diet and engage in regular exercise and physical activity. When parents model ideal behaviors, children are more inclined to learn, and therefore, mimic those same behaviors (Dickens & Ogden, 2014; Leary, Lilly, Dino, Loprinzi, & Cottrell 2013; Tandon et al., 2014). Subsequently, the most effective programs and interventions that target childhood obesity have been based on family orientation, nutrition, and active play (Jones et al., 2014; Wilkerson, Goldberg, Albright, Allison, & Haemer, 2015).

One of the most successful family-based programs in the United States is the Women, Infants, and Children Nutritional Supplementation Program (WIC), which is funded through federal grants that are issued for supplemental foods, health care referrals, and nutrition education for low-income pregnant, breastfeeding, and nonbreastfeeding

postpartum women (National WIC Association, 2013). The majority of its services are implemented through health departments, hospitals, mobile clinics, schools, public housing sites, and community centers (National WIC Association, 2013). The Women, Infants, and Children Nutritional Supplementation Program services over 9 million women and children each month (National WIC Association, 2013). As a result, it may serve as a segue for the potential enhancement of other public health programs that specialize in the improvement of child health outcomes by way of breastfeeding promotion, health education, prevention, and parental development.

Problem Statement

On a global scale, over 1.4 million deaths could be prevented if children under the age of 5 were exclusively breastfed each year (Bomer-Norton, 2014); additionally, breastfeeding 90% of U.S. children for the first 6 months of life would prevent the loss of $13 billion dollars associated with morbidity costs (Bomer-Norton, 2014). Moreover, children who are exclusively fed with breast milk receive optimal nutrients that promote growth and cognitive development, in addition to immunologic IgG protection, which helps eliminate harmful bacteria from the infant's intestine and reduces the incidence of gastroenteritis, respiratory tract infections, and leukemia (Grzelak et al., 2014; Li, Dee et al., 2014). After acknowledging some of the benefits of breastfeeding practices, it is likely that breastfeeding may also provide insight on how parental control influences eating habits and physical activity in children.

As obesity rates have increased more than four times among children ages 6 to 11, over 23 million U.S. children and adolescents are overweight or obese (Leadership for

Healthy Communities, 2014). As a result, children are more prone to developing heart disease, stroke, asthma, and various forms of cancer (Lefebvre & John, 2014; Moss & Yeaton, 2014; Yan et al., 2014). Because African Americans are disproportionately affected by the obesity epidemic (Pan, May, Wethington, Dalenius, & Grummer-Strawn, 2013; Whaley et al., 2012; Wilkerson, et al., 2015), it is necessary to take heed to the lifestyles and behaviors of both parents and children collectively. Above all, the majority of research on breastfeeding fails to incorporate parental influence and child health behaviors after several years. Correspondingly, researchers have yet to design a study that targets obesity prevention and long-term health behavior within the scope of exclusive breastfeeding. Given the extant research on breastfeeding, maternal influence, and child health behaviors, these concepts have not been properly examined in the same study among African American WIC populations.

Purpose of the Study

The purpose of this quantitative study was to explore and understand the potential association between exclusive breastfeeding (independent variable) and maternal control over childhood nutrition and physical activity (dependent variables) among African American women and children enrolled in the Women Infants and Children Nutritional Supplementation Program. Despite the disparities associated with breastfeeding, there is a need for more profound inquiry surrounding the association between parental influence and child health status. Because breastfeeding is considered a health behavior, it is important for public health officials to understand its implications in relation to the

physical activity and nutritional practices of children prior to developing maternal and child health strategies that will influence social change.

Research Questions and Hypotheses

The research questions (RQs) and hypotheses I developed to guide this study were as follows:

RQ1: Among African American WIC participants, is there an association between exclusive breastfeeding and maternal control over eating behavior in children within a 6-year period?

$H_0$1: Among African American WIC participants, there is no relationship between exclusive breastfeeding and maternal control over eating behavior in children within a 6-year period.

H_a1: Among African American WIC participants, there is a relationship between exclusive breastfeeding and maternal control over eating behavior in children within a 6-year period.

RQ2: Among African American WIC participants, is there an association between exclusive breastfeeding and maternal control over physical activity in children within a 6-year period?

$H_0$2: Among African American WIC participants, there is no relationship between exclusive breastfeeding and maternal control over physical activity in children within a 6-year period.

H_a2: Among African American WIC participants, there is a relationship between exclusive breastfeeding and maternal control over eating physical activity in children within a 6-year period.

I measured the independent variable of exclusive breastfeeding by breastfeeding duration in months. The first dependent variable of maternal control over physical activity was measured by frequency or the number of days per week physical activity took place under the mother's care, while maternal control over eating behavior was based on eating habits that encompassed the frequency of family meals for both children and adults, fast food consumption, and fruit and vegetable availability in the home. I will provide a detailed explanation of the intended statistical analysis in Chapter 3.

Theoretical Framework

I chose the social cognitive theory, created by Albert Bandura, to serve as the theoretical framework for this study because it provides a platform for primary prevention strategies that can be used to understand the attitudes and behaviors of children. The social cognitive theory was built upon the social learning theory and posits that learning occurs through a reciprocation of personal, behavioral, and environmental factors (Bandura, 1986). As both social and psychological aspects contribute to an individual's behavior, it is essential to acknowledge the cognitive notions associated with an individual's actions. Bandura (1986) claimed that knowledge, perceived self-efficacy, and outcome expectations are personal factors, while proximal and distal goals relate to behavioral factors. Additionally, any barriers or mechanisms that provide support are considered to be environmental factors (Bandura, 1986). As all of these components

make up the social cognitive theory, it was a useful framework through which to explore the ways in which vicarious observation contributes to behavior development in children.

For example, children who learn from their parent's provisions over their food and levels of physical activity may be more likely to continue those learned behaviors well into adolescence and adulthood. Wroten, O'Neil, Stuff, Liu, & Nicklas, 2012) discovered that preschool children chose healthier food options after observing such behavior from their parents. Although learning can modify behavior, individual choice often reflects the preconceived consequences of behavior (Bandura, 1986). A child may be more inclined to abide by their parent's recommendations when the outcomes of being unruly are associated with various forms of discipline within the home environment. More importantly, the social cognitive theory claims that people are more likely to follow the behaviors modeled by someone with whom they can identify, due to emotional attachments between the observer and subject (Bandura, 1986). This is paramount in examining the relationship between the nurturing role of a mother and her child during breastfeeding and early childhood.

Lastly, the component of self-efficacy, or the belief in one's ability to achieve a goal, also plays a role in health behavior and the ways that individuals views themselves and others (Bandura, 1986). For this reason, children who receive positive reinforcement from their parent may be more likely to have higher levels of confidence, self-esteem, and belief that they can maintain healthy eating habits and engage in physical activity on a regular basis. In addition to this, self-efficacy has been found to also influence African American mothers' intentions to breastfeed (Spencer & Grassley, 2012). Therefore, it is

possible that self-efficacy could also stimulate maternal control resulting in more mothers believing in their abilities to monitor their child's health behaviors. Accordingly, I will discuss Bandura's social cognitive theory and the psychosocial tenets of reciprocal determinism, behavioral capability, observational learning, outcome expectations, incentive motivators, and self-efficacy in more detail in Chapter 2 along with specific references to the current literature.

Nature of the Study

In this quantitative longitudinal study, I measured multiple variables over an extended period of time in order to determine if there was an association between exclusive breastfeeding and maternal control over eating behavior and physical activity in children after 6 years. Longitudinal studies allow researchers to monitor the development and or changes that occur within the target population (Institute for Work and Health, 2015). By examining study variables at both the individual and group levels, the health needs of any given population are accurately assessed, and are therefore, invaluable in creating public health agendas that allocate the appropriate resources for program initiatives (Institute for Work and Health, 2015).

The sample population for this study was based on secondary data from the Infant Feeding Practices Study II (IFPS II) and its Year 6 Follow-Up (Y6FU). Both the Food and Drug Administration and the Centers for Disease Control and Prevention collected monthly data from mothers beginning their third trimester of pregnancy until 1 year postpartum for the IFPS II. The Infant Feeding Practices Study II was created in response to the need for improving the health status of women and children and provided

information about breastfeeding, hospital experiences, postpartum depression, infant feeding and sleeping patterns, as well as WIC participation.

In 2012, the follow-up study was administered when children from the IFPS II were 6 years of age. Mothers were mailed a questionnaire or interviewed by phone to provide information about their long-term experiences of infant feeding, including child behavior and development, maternal feeding styles, physical activity levels, food and home environments, oral health, and family medical history. I used this dataset for several reasons. First, the IFPS II and its Y6FU is the largest longitudinal study conducted on infant feeding in the United States. Secondly, in the study researchers used a prospective design in which data were collected for an extended period of time. Finally, the detailed nature of survey questions provided a basis for exploring the intricacies of maternal and child health behaviors.

For this study, the independent variable was exclusive breastfeeding because it is considered to be the optimal way to feed an infant for the first few months of life (World Health Organization, 2016). Babies who are exclusively breastfed for 6 months are considered to be healthier when compared to babies who are mixed fed or given juice, water, and other foods (Alipui, 2012; American Academy of Pediatrics, 2012; Bomer-Norton, 2013; Grzelak et al., 2014; Kelishadi & Farajian, 2014; Li, Dee et al., 2014). Conversely, the dependent variables consisted of maternal control over physical activity and eating behaviors. Lastly, there were several covariates that had the potential to affect the outcomes of this study, including age, education, marital status, employment status, parity, and household income. I used inferential statistics through chi square tests and

logistic regression to test the hypotheses of no association between exclusive breastfeeding and maternal control over eating behavior and physical activity. I created tables indicating the level of associations between the aforementioned variables and these are located in Chapter 4.

I selected the concept of maternal control as a variable because it highlights the importance of parental decision-making and its impact on children who often fall victim to circumstances beyond their control. Children only model the behaviors to which they are exposed (Bandura, 1986). Therefore, it is crucial for parents to understand that their food choices and activity levels serve as the blueprint for their child's health and wellbeing. Although I used the dependent variables to assess child eating behaviors and physical activity to some extent, data were only collected from the mother who served as the sole source of inquiry for this study.

Despite the myriad of studies that have addressed breastfeeding and childhood obesity through both quantitative and qualitative measures, few researchers have acknowledged the possibility that breastfeeding could influence maternal feeding styles beyond 2 years of age. Moreover, researchers have failed to demonstrate the need for maternal control factors as a mechanism for obesity prevention in early childhood. Because quantitative analysis demonstrates the existence of association, the results of this study may be used as a tool for further qualitative or mixed method inquiry.

Operational Definitions

I have defined the following terms to aid in the understanding of concepts and terminology throughout this study:

African American/Black: An American with ancestors of African descent or people having origins in any of the Black racial groups of Africa (Centers for Disease Control and Prevention, 2015a). Used interchangeably with the term *Black*.

Breastfeeding: The practice of a female mother supplying milk to her infant by way of her breast (UNICEF, 2015). Babies should latch on to its mother's nipple for skin-to-skin contact and or suckling immediately after birth (UNICEF, 2015; World Health Organization, 2016).

Breastfeeding duration: The length of time a mother breastfeeds her infant, which may include exclusive or complementary feeding; often measured in weeks or months (World Health Organization, 2016).

Breastfeeding initiation: When a mother breastfeeds her baby for the first time, usually within the first hour of birth; this may include pumped breast milk (World Health Organization, 2016).

Complementary feeding: When children receive both breast milk and solid or semisolid foods as a result of breast milk not meeting the nutritional needs of the infant (UNICEF, 2015). Children should only engage in such feeding between 6 and 24 months of age (UNICEF, 2015).

Eating behavior: Nutritional practices that include food portion control and frequency, food and beverage intake and preference, food combinations, etiquette, and meal and snack patterns (Frankel et al., 2014; Wroten et al., 2012).

Exclusive breastfeeding: When infants are solely fed breast milk from his or her mother and no other food or liquid, which is recommended for the first 6 months of life (UNICEF, 2015).

Formula: The use of artificial milk for babies that is often made up of sugar, modified cow's milk, soybean liquid, and vegetable oils in lieu of breast milk (UNICEF, 2015). These artificial milks are usually distributed in a powder form and mixed with water prior to feeding (UNICEF, 2015). The use of formulas are also referred to as bottle feeding or artificial feeding.

Maternal control: The extent to which a mother will oversee, monitor, restrict, or encourage a child's health behaviors (Dickens & Ogden, 2014; Leary et al., 2013).

Physical activity: Any body movement produced by skeletal muscles that requires energy expenditure and enhances health; this may include walking, running, cycling, or recreational activities (World Health Organization, 2016).

WIC participants: Those women and children who participate in activities associated with WIC, which is a federally-funded program based on prevention, education, referrals, and food benefit packages for low-income pregnant, postpartum, and breastfeeding women (National WIC Association, 2013).

Assumptions

My assumptions in this study were predominately generated from the usage of secondary data collected by the Centers for Disease Control and Prevention for the IFPS II and its Y6FU. Participants began providing information from the third trimester of pregnancy until 1 year postpartum and approximately six years later. Because data were collected in monthly intervals, there was less potential for recall bias. Due to the questionable nature of self-reported data that is often influenced by social desirability, I made the following assumptions:

- All respondents reported accurate data.
- Study respondents were able to comprehend and understand both the questions and response categories.
- Cultural competency was used appropriately in both the questionnaire or phone interview.
- All WIC participants were properly educated and encouraged to breastfeed by way of the WIC program counselors and staff.

Scope and Delimitations

The collective purpose of the IFPS II and its Y6FU was to identify the immediate and long-term health and developmental outcomes of infant feeding, food behavior, and maternal experience. Although the IFPS II and the Y6FU were national studies, I limited the population of interest for this study to African American WIC participants who were at least 18 years of age at the time of data collection. My aim with this research was to explore and understand the potential association between exclusive breastfeeding and

maternal control over child health behavior, specifically physical activity and nutrition. Exclusive breastfeeding was used as a tool of reinforcement for explaining the concept of maternal control. In light of the extensive amount of information on all variables of study, the true objective lies within the identification of an association. For this study, I only focused on the perspective of the mother and the dynamic of her control in her relation to her child's behaviors. Even though there are numerous social and environmental factors that influence child health behaviors that are indeed valid, they did not apply to the RQs at hand. However, they may be a just cause for future studies.

Limitations

The main limitation of the IFPS II and the Y6FU data that I used in this study was that the sample was not nationally representative. Because I only sampled African American mothers in this secondary analysis, it may be somewhat difficult to apply or generalize the findings from this study to other African American populations of women and children. Nonetheless, the outcomes of this study have contributed to newfound knowledge that I will elaborate on in Chapter 5. Other plausible limitations of the data are as follows:

- 48% of respondents were unable to be contacted or refrained from participating in the Y6FU.
- Some mothers may have felt that breastfeeding was socially desirable. This may have impacted the responses to questions concerning exclusive breastfeeding, maternal control, child behaviors, or the disclosure of accurate information altogether.

- It was not documented in the IFPS II and the Y6FU if there were mothers who were physically unable to breastfeed after expressing the desire to do so.
- Considering the cultural differences of geographic regions, breastfeeding rates and parenting styles may differ in various demographic locations. The IFPS II and the Y6FU did not categorize data between rural and urban populations.

Significance of the Study

In this study, I explored the concept of maternal control over child eating behaviors and physical activity levels within the context of exclusive breastfeeding. Mothers who exclusively breastfeed their infants may be more inclined to monitor their child's eating habits and levels of physical activity years after giving birth. The findings from this study can be used to influence positive social change by helping public health officials identify tactics to prevent childhood obesity through the promotion of maternal breastfeeding initiatives.

By focusing on African American WIC participants, these study outcomes can serve as a microcosm for low-income, ethnic minority populations while contributing to the paucity of knowledge surrounding the prevention of health disparities. Specifically, African American children who live healthier lifestyles and are within a normal weight range will be less likely to develop diabetes, hypertension, asthma, and have poor levels of self-esteem and body image (Centers for Disease Control and Prevention, 2015b). As a result, medical expenditures will more than likely decrease due to children living healthier lifestyles well into adulthood. Also, children with a healthy weight perform

better academically as adolescents and may make a greater contribution to the workforce as adults (Centers for Disease Control and Prevention, 2014).

Ultimately, I channeled this study through a systems approach to improve both individual and population-based health outcomes. The conclusions drawn from this study serve as a motive for the investment in more breastfeeding promotion initiatives to increase the number of children who can benefit from breast milk. Through the enhancement of current programs, such as WIC, and the development of sustainable partnerships, the number of African American women who intend to breastfeed may increase, which would be inversely related to the percentage of children suffering from chronic diseases associated obesity and poor breastfeeding rates (Spencer & Grassley, 2012).

Implications for Social and Global Change

The results of this study may help promote social change by contributing to the body of knowledge associated with linking breastfeeding to early childhood obesity prevention. As a scholar practitioner, my only goal was to explore and unveil new information that aided in the clarification of the veritable origin of poor child health outcomes that are preventable in the United States. By increasing the number of African American women who exclusively breastfeed, there will be more health benefits for both mothers and children, as the number of women who intend to breastfeed in the African American community is significantly lower than any other racial group (Mattox, 2012; Spencer & Grassley, 2012; Spencer et al., 2014). This is not an issue that has occurred by chance or coincidence, as it has continued to progress to become one of the most

prominent health disparities in the United States. This study is not only noteworthy for its holistic perspective, but also for the strategic development of potential solutions for health issues that are far more complex than the sum of its parts.

The low breastfeeding rates among African American women are the epitome of health disparities as it is interconnected to social, economic, cultural, and psychological factors, many of which are institutionalized as social normality. Unfortunately, Black women's decisions to breastfeed derive from cultural adaptations to environmental factors (Spencer & Grassley, 2012). Therefore, it is necessary that the public health strategies and interventions designed for African Americans mirror the very essence of racial and ethnic circumstance. With this in mind, breastfeeding promotion symbolizes the opportunity for advancement for improving the health status of the African American population by way of social change.

In regard to childhood obesity, breastfeeding promotion programs may be a means for decreasing the number of families with children who suffer from the ailments associated with being overweight or obese. As more children are granted the right to a supreme start in life, there will be less morbidity and mortality, and an increased likelihood of social wellbeing that will undoubtedly continue over the course of a child's lifespan. Additionally, breastfeeding promotion initiatives may also serve as a basis for improving maternal control and parental influence over developmental milestones in the home. Overall, the increased incidence and prevalence of childhood obesity and suboptimal breastfeeding rates stand at the forefront of the African American public health agenda. By increasing public awareness for breastfeeding there may be more buy-

in from local stakeholders and agencies that are affected by the African American community. Thereby, with more concrete program design and implementation efforts for African Americans, the results of this study may be used as an intercessor for maternal and child health efforts worldwide.

Summary

Breastfeeding and childhood obesity among African Americans has had a cumulative effect on the health outcomes of children within the last decade. Many Black women feel as if they have no support for breastfeeding or are simply unaware of the benefits of breastfeeding (Furman, Banks, & North, 2013; Ware, Webb, & Levy, 2014). Although there are programs that highlight breastfeeding promotion, few researchers have explored how the act of breastfeeding can impact other health behaviors. The decision to breastfeed also parallels the decisions to live a healthy lifestyle. A study based on the IFPS II included 2,387 mothers and provided insight on how overweight and obese mothers were more likely to introduce solid foods and less likely to breastfeed than their counterparts with a normal body mass index (BMI) (Kitsantas, Gallo, Palla, Nguyen, & Gaffney, 2016). It is crucial for women to understand the extent to which their decisions affect their children. Some believe that breastfeeding should be posited as a module for health equity and social justice because of its potential to reduce those disparities that are evident at birth (Alipui, 2012). In this longitudinal study, I tested the possibility of an association between exclusive breastfeeding and maternal control over physical activity and eating behaviors among WIC participants after 6 years. Healthcare and public health professionals, WIC clinics, community centers, schools, and other agencies that are

invested in improving the health status of children may find use for the results from this study.

In Chapter 1, I provided a brief introduction to the topic of breastfeeding as well as an explanation of the importance of the study. In Chapter 2, I will provide a review of current literature that addresses the value and benefits of breastfeeding for women and children, the theoretical foundation for the study, a thorough evaluation of the Women, Infants, and Children Nutritional Supplementation Program (WIC), and a systems approach to integrating the leading indicators of childhood obesity within the context of parental control. In Chapter 3, I will discuss the research design and methods used for secondary analysis, while a description of the testing of hypotheses and study results will be offered in Chapter 4. Chapter 5 will conclude the study with my interpretations of the findings, social change implications, and recommendations for future research.

Chapter 2: Literature Review

Introduction

The protective factors of breastfeeding are well known; however, in the United States disparities continue to persist. For example, only 39.1% of African American women breastfeed for a baby's first 6 months of life compared to 57.9% of White women and 45.6% of Hispanic women (Centers for Disease Control and Prevention, 2016a). Women who choose to breastfeed utilize one of the most cost-effective forms of primary prevention, yet many are reluctant to take on the task. Children who are breastfed have improved growth and development and are less prone to disease compared to children who are not breastfed (Bomer-Norton, 2014; Grzelak et al., 2014; Mathur & Dhingra, 2014). Because mothers also receive health benefits (American Cancer Society, 2015; McTeer, 2012; Spencer & Grassley, 2012), breastfeeding is a protypical example of how two individuals can impact population health in the highest regard.

Early childhood is one of the most critical time periods of a child's life as food preferences and health behaviors are established by way of parental influence. Studies have indicated that parents are instrumental in child health, and therefore, the behaviors that continue through adolescence and an individual's adult life (Knowlden, Sharma, Cottrell, Wilson, & Johnson, 2015; Moss & Yeaton, 2014; Wroten et al., 2012). Due to the current state of emergency surrounding the obesity epidemic, there is a need for more comprehensive prevention-based strategies that cater to children and places emphasis on the importance of family and the home environment.

Eating a well-balanced diet and engaging in regular physical activity should not only be portrayed as a means for children to lose weight, but as an opportunity for them to live a healthy lifestyle. Children who maintain a healthy weight will have positive health outcomes (Dixon et al., 2012), improved levels of self-esteem (Lefebvre & John, 2014), and a strong knowledge base (Byrd-Bredbenner et al., 2011) that will adhere to making conscious health decisions that will persist into adulthood. Obesity-related issues make up a large sector of medical expenditures, cause a diminished quality of life, and in some cases lead to premature death (Yan et al., 2014).

As a result, I will present the Women, Infants, and Children Nutritional Supplementation Program in this literature review as a potential intermediary, in which public health interventions could build upon. WIC is a federally-funded program based on prevention, education, referrals, and food benefit packages for low-income pregnant, postpartum, and breastfeeding women (National WIC Association, 2013). Several researchers have capitalized on the benefits of the WIC program (Langellier, Chaparro, & Whaley, 2012; Whaley et al., 2012), while others have focused on its shortcomings and faulty claims (Furman et al., 2013; Jensen, 2012).

The social cognitive theory served as the theoretical framework for this study as it is applicable to the ways in which children learn to model behaviors. I will outline each construct of the social cognitive theory in relation to the study's objectives and RQs. Therefore, my references to the literature will reinforce Bandura's theory through example and suggestion for further study. A myriad of health behavior studies have been grounded in the social cognitive theory (Ahmed & Ouzzani, 2013; Hall, Chai,

Koszewski, & Albrecht 2015; Pedersen, Gronhoj, & Thogersen, 2015; Ramirez, Kulinna, & Cothran, 2012), and used the constructs of reciprocal determinism, behavioral capability, observational learning, outcome expectations, incentive motivation, and self-efficacy to parallel various methodologies.

The results of this study may help inform clinical practice through public health officials gaining a better understanding of two of the most prominent health disparities that disproportionately affect African Americans. Because Black women have the lowest rates of breastfeeding (Spencer & Grassley, 2012; Spencer et al., 2014) and African American children are more than twice as likely to be obese than their White counterparts (Pan et al., 2013), there may be a relationship that coexists between these two pillars that have troubled the minds of public health professionals over the years. Although there is a paucity of research on breastfeeding, parental influence, and child health behaviors, these variables have yet to be collectively examined in the same study. As a scholar practitioner, my aim was to explore the concept of maternal control as it pertained to nutrition and physical activity and to determine if there was any association between breastfeeding and child health behaviors in children after 6 years.

I will begin the literature review with an explanation of the maternal and child benefits of breastfeeding and how it can potentially be used as a preventive measure to combat childhood obesity. By focusing on low-income African American women enrolled in the Women, Infants, and Children Nutritional Supplementation Program (WIC) and examining the barriers of breastfeeding in poverty-stricken environments, I will promote a systematic way of thinking in this study. The review will conclude with a

thorough examination of the concept of maternal control and its influence on diet and physical activity, thereby creating a platform for future public health interventions designed for the improvement of breastfeeding rates and obesity prevention.

Literature Search Strategy

I strategically conducted this review of the literature to lay an all-inclusive foundation for this study that was designed to determine if there was any association between exclusive breastfeeding and maternal control over eating behavior and physical activity in children within a 6-year period. The majority of peer-reviewed articles that I collected for this literature review were digitally accessed through MEDLINE and or PubMed, CINAHL, EBSCOhost, Cochrane Library, Google Scholar, as well as other credible websites and references cited in several studies. The key words and phrases that I used included *breastfeeding, African American, Black, women, minority populations, exclusive breastfeeding, benefits of breastfeeding, low-income, poverty, childhood obesity, Women, Infants, and Children's Nutritional Supplementation program/(WIC), parental influence, parental control, maternal influence, maternal control, feeding styles, child eating behavior, diet, nutrition, exercise,* and *physical activity*. In order to reach saturation of the literature, the Boolean operators "AND" and "OR" were used to identify a total of 366 articles written in English within the last 6 years from 2011–2017.

Theoretical Foundation

The Social Cognitive Theory

The social cognitive theory evolved from Bandura's social learning theory and is comprised of several psychosocial tenets that reinforce the primary concept of reciprocal

determinism, including behavioral capability, observational learning, outcome expectations, incentive motivators, and self-efficacy (Bandura, 1986). In the following subsections, I will outline a description of each tenet and provide references to current literature.

Reciprocal determinism. Albert Bandura (1986, 1989) posited that an individual's behavior is predominately based on a triad of *reciprocal determinism*, shown in Figure 1, in which environmental, behavioral, and personal factors are interchangeably projected through human agency. Personal or cognitive factors encompass thoughts, emotions, anticipations, and goals, while behavior is usually a response to stimuli that relies heavily on knowledge and skill execution (Bandura, 1986, 1989). Lastly, the physical surroundings of a person's environment are socially influenced and ultimately play a role in the frequency and intensity of human action (Bandura, 1986, 1989). The constant exchange between an individual and his or her environment provides substance for an adaptive learning equilibrium. Bandura (1986) claimed that all beings possess a hierarchal self-regulating system that is fixed in symbolism and channeled through experience.

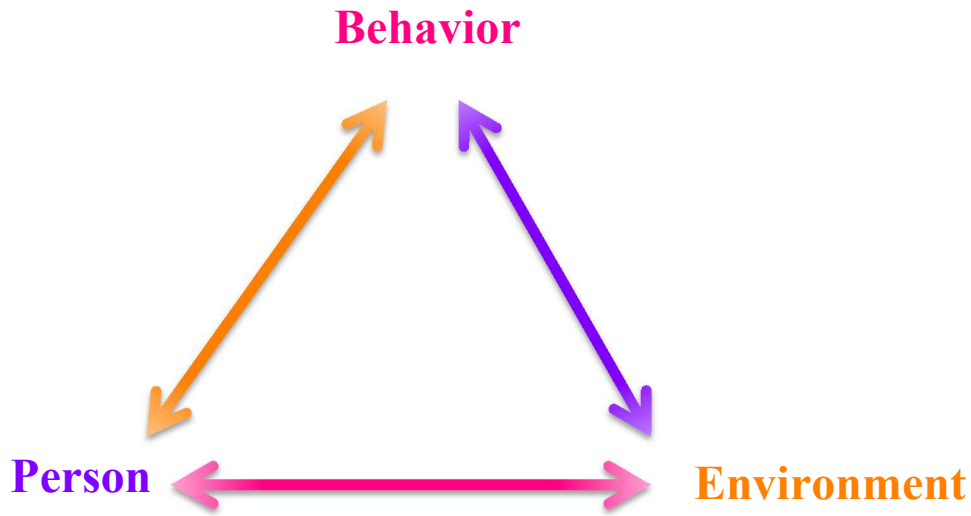

Figure 1. Triad of reciprocal determinism from the social cognitive theory. Electronically reproduced from *Social Foundations of Thought & Action: A Social Cognitive Theory,* by A. Bandura, 1986, Upper Saddle River, New Jersey: Pearson Education, Inc. Adapted with permission.

Behavioral capability. Bandura (1989) suggested that human behavior is the interplay of self-direction and external forces that collectively guides thoughts and planned courses of action. *Behavioral capability,* or the capacity of forethought, refers to an individual's ability to process information and carry out actions or perform a behavior (Bandura, 1986). These thoughts can also influence behavior, alter environments, and breed collective action within a systems feedback loop (Bandura, 1986). Several studies have utilized this concept to develop accurate perceptions of physical activity behavior in school-age children (Ramirez et al., 2012; Young, Plotnikoff, Collins, Callister, & Morgan, 2014). More importantly, African American parents in the state of Georgia admitted that they could prevent childhood obesity by exercising with their child, controlling food portions, providing healthy snacks, and limiting screen time (Alexander,

Alfonso, & Hansen, 2015). Likewise, the social cognitive theory was the most suitable theoretical framework for exploring the concept of maternal control and child health behaviors among African American WIC participants.

Observational learning. *Observational learning* is the bidirectional component that allows individuals to witness new behaviors through interpersonal or media exposure only to perform those same actions (Bandura, 1986). This is a reciprocal process because those who model the behavior may undergo behavior change once they are aware of the observation that is taking place (Bandura, 1986). Due to observational learning being most common during childhood, the majority of learning occurs through the socialization examples set forth by an individual's parents and siblings before attending school (Bandura, 1986).

Bandura's (1986) Bobo doll experiment demonstrated how children learned to mimic adult behaviors after viewing a series of films that outlined a system of rewards and punishments. Bandura proposed that children are more likely to imitate those whom they admire or perceive as nurturing. Also, children look to their parents for guidance when they lack confidence or are in an unfamiliar situation (Bandura, 1986). This was a fundamental component for this study as the maternal influence on child health behaviors surrounding nutrition and physical activity provide insight on how children can vicariously learn to live a healthy lifestyle at such an impressionable age.

In recent studies, parents were considered to be *gatekeepers* of healthy eating as a result of child fruit and vegetable consumption increasing when mothers modeled behaviors and created a supportive environment (Knowlden et al., 2015; Pedersen et al.,

2015). Subsequently, preschool children were more likely to choose healthy food options when they were able to witness their parents purchase such items (Wroten et al., 2012). Ultimately, children who learn how to make healthy food choices and engage in regular physical activity may be more inclined to continue these learned behaviors well into adolescence and beyond.

Outcome expectations. *Outcome expectations* are the anticipated consequences of one's actions or behavior that are based on past experiences and the moral values associated with the intended outcomes (Bandura, 1986). Prospective behaviors that are coupled with goal attainment strategies are generated by determinism and strengthened by self-influence (Bandura, 1989). Most people desire outcomes that are socially acceptable and breed favorable judgment (Bandura, 1989). For example, among elementary aged children who wore a pedometer for 5 school days, it was noted that positive exercise behaviors was directly related to perceived self-efficacy and outcome expectancies (Ramirez et al., 2012). However, some researchers have claimed that outcome expectations, goals, and socio-cultural factors have no effect on physical activity behavior (Jekauc et al., 2015; Young et al., 2014).

Incentive motivation. *Incentive motivation* is the positive or negative reinforcements that contribute to responses to behavior (Bandura, 1986). Rewards and punishments often determine a person's expectations and perceived sense of self (Bandura, 1986). Actions that are rewarded are generally repeated, while those that yield punishable outcomes tend to be rejected (Bandura, 1986). For this reason, motivation is not always internal but influenced by outside resources that facilitate or impede an

intended course of action. Bandura (1986) suggested that rationality is not only subjective and cognitively biased, but reliant upon reinforcement transactions that hold personal value. In addition to this, the magnitude of social support also contributes to behavior adoption as well as the ability to overcome adversity (Bandura, 1986). According to Byrd-Bredbenner et al. (2011), the outcome expectations of healthy dietary behaviors served as motivation within itself as BMI scores were lowest among those with the highest outcome expectations.

Self-efficacy. *Self-efficacy* is the final premise of the social cognitive theory that underscores confidence, self- regulation, and personal insight that affects the likelihood of behavior. Perception and belief in oneself influences performance and commitment despite situational circumstances (Bandura, 1989). There is insurmountable power in the notion of self-efficacy, as doubt and self-limitation have been proven to be far more disabling than true inability or incompetence (Bandura, 1989). With this in mind, children who receive positive encouragement from their parents might have higher levels of self-esteem and confidence in their abilities to live a healthy lifestyle.

In a recent study of 393 elementary students, self-efficacy and social support were found to be influential predictors of physical activity among minority populations (Harmon et al., 2014). In regard to nutrition, self-efficacy was most influential in the consumption of fruits and vegetables among children who participated in a social cognitive theory based nutrition education program (Hall et al., 2015). In addition to this, Ahmed and Ouzzani (2013) used Bandura's self-regulation model from the social cognitive theory to assess a 24-hour web-based breastfeeding monitoring system over the

course of 30 days to identify problems and provide ongoing lactation support. Although the monitoring tool was very successful in helping mothers and lactation consultants keep track of breastfeeding patterns and establishing continuous lines of communication, it may have been the self-reinforcement, self-evaluation, and self-monitoring components of the social cognitive theory that warranted the promising results of the study (Ahmed & Ouzzani, 2013).

The major components of the social cognitive theory directly correlate to this study because children who learn to model healthy behaviors set forth by their parents may be more prone to maintain a balanced diet that is coupled with moderate levels of physical activity as an adult. Given that parenting styles within the home environment can also incorporate forms of discipline, children will more than likely abide by their parents provisions out of fear of being unruly. Subsequently, children are more apt to learn behaviors from those with whom they identify or have emotional ties (Bandura, 1986). Hence, the bond that is formed through the act of breastfeeding and early childhood serves as a platform for modeling behaviors. In essence, parental influence plays a major role in the way that children view themselves and others, but it has not been explored within the context of breastfeeding.

Bandura's social cognitive theory has been used in countless studies that have evaluated physical activity and nutrition-based interventions involving children as well as those that are associated with breastfeeding. This study integrated these two previously evaluated concepts in hopes of gaining a better understanding of ways to improve maternal and child health outcomes among low-income minority populations. Thus, the

social cognitive theory was used as the theoretical framework for determining if there was an association between exclusive breastfeeding, child eating behaviors, and levels of physical activity among African American WIC participants.

The Lure of Breastfeeding and Recommendations

Breastfeeding or lactation is a mammalian process that provides the optimal source of nourishment for a growing baby. Breast milk is a liquid living tissue that cannot be manufactured or replicated as it contains vitamins, DNA, and essential minerals that stimulate the development of both the immune and central nervous system (Grzelak et al., 2014; White, 2014). A mother's breast milk changes in composition and adapts to the needs of her baby making it a physiologic phenomenon (Grzelak et al., 2014; World Health Organization, 2013). The World Health Organization (2017) recommends that babies be exclusively breastfed for the first 6 months of life, with continued breastfeeding up until 2 years. However, the American Academy of Pediatrics (2012) suggests that breastfeeding should take place for at least one year. Nonetheless, the Healthy People (2017) goal for 2020 is for 81.9% of women to initiate breastfeeding with 46.2% and 25.5% exclusively breastfeeding at 3 and 6 months respectively.

Child Benefits of Breastfeeding

Mathur and Dhingra (2014) claim that the human body's response to artificial milk may cause indigestion, rashes, and diarrhea in some infants, while the lack of maternal antibodies and T-lymphocytes in baby formula can potentially lead to infection. As breastfed infants have more immunity through immunoglobulin G (IgG), they also have lower rates of morbidity and mortality as bacteria is less likely to penetrate

throughout the intestines (Bomer-Norton, 2013; Grzelak et al., 2014). Overall, children who are breastfed have reduced incidence of non-communicable diseases such as cancer and cardiovascular disease (Alipui, 2012; Bomer-Norton, 2013; Grzelak et al., 2014; Kelishadi & Farajian, 2014; Spencer & Grassley, 2012), as well as lower rates of gastroenteritis, upper and lower respiratory tract infections, leukemia, type 1 and type 2 diabetes, allergies, and sudden infant death syndrome (Bomer-Norton, 2013; Grzelak et al., 2014; Li, Dee et al., 2014). Although studies have revealed that breastfeeding can reduce Crohn's disease and rheumatoid arthritis, researchers failed to implement randomization and large sample sizes leading to questionable results (Grzelak et al., 2014; Kelishadi & Farajian, 2014).

Breastfeeding can be used as an equal marker for health status in that infants receive a natural source of nutrients that promote normal growth, enhanced brain function, and mental well-being later in life (Bomer-Norton, 2013; Grzelak et al., 2014; Reynolds, Hennessy, & Polek, 2013). Some studies claim that breastfeeding infants can help regulate blood pressure during adulthood as there is less sodium present in breast milk compared to formula (Grzelak et al., 2014; Kelishadi & Farajian, 2014). In addition to this, infants who are fed formula consume more calories and higher levels of protein and fat, which will lead to an increase in the number of adipocytes or fat cells in connective tissue, causing unhealthy weight gain (Grzelak et al., 2014; Kelishadi & Farajian, 2014; McTeer, 2012). According to McTeer (2012), breastfeeding is one of the most effective ways of introducing the concept of appetite and portion control to an infant.

Lastly, children who were breastfed scored an average of five points higher on IQ tests and were 1 to 6 months ahead of children who were never breastfed (Quigley et al., 2012). However, Colen and Ramey (2014) discovered that breastfed children performed somewhat lower scholastically than children who were not breastfed. Despite these mixed findings, the majority of research has been largely attributed to the protective factors and positive outcomes associated with breastfeeding.

Maternal Benefits of Breastfeeding

Breast milk also has several protective factors for mothers, such as reducing the risk of breast, uterine, and ovarian cancer (American Cancer Society, 2015; Bomer-Norton, 2013; Mathur & Dhingra, 2014; Spencer & Grassley, 2012). Specifically, the benefits of breastfeeding are cumulative in nature and are directly proportional to the total number of children that are breastfed over the course of a mother's life (Bomer-Norton, 2013). Similarly, mothers who partake in breastfeeding are less likely to suffer from postpartum hemorrhaging (Mathur & Dhingra, 2014) and are more inclined to lose weight (Bomer-Norton, 2013) as the uterus contracts back to its normal size shortly after giving birth (McTeer, 2012). Furthermore, the emotional state of a woman who breastfeeds is coupled to oxytocin levels and sensory nerves in the breast making up the oxytocin reflex (Mathur & Dhingra, 2014). As a mother comes into physical contact with her baby, she should elicit a response of positive emotions that will ultimately enhance the levels of oxytocin and increase milk production (Mathur & Dhingra, 2014).

Conversely, there are adverse effects for women who do not breastfeed. In the Million Women Study, researchers concluded that mothers who followed breastfeeding

recommendations were no more obese than women who had never been pregnant (Schwarz, 2013). Also, mothers who had never breastfed were more likely to develop hypertension, diabetes, and had 28% more visceral fat compared to those mothers who breastfed for at least three months (Schwarz, 2013; Spencer & Grassley, 2012).

Breastfeeding from a Public Health Perspective

The benefits of breastfeeding extend beyond the protective bond that coexists between a mother and her child. Although the natural contraception associated with breastfeeding and birth spacing and or family planning are often overlooked (Alipui, 2012), it is essential to understand the importance of maternal and child health and how it impacts the overall population. For example, breastfeeding 90% of children in the United States could potentially save 13 billion dollars in morbidity costs, while minimizing the amount of waste accumulated from mass production of baby formula and bottles could help advance strategies for environmental sustainability (Bomer-Norton, 2013).

With this in mind, breastfeeding may serve as a catalyst for the prioritization of the global health agenda as it unifies 7 of the 8 Millennium Developmental Goals set forth by the United Nations. Improving maternal health, reducing child mortality, eradicating hunger, ensuring environmental sustainability, and promoting gender equality, education, and empowerment are all invaluable in the endorsement of breastfeeding promotion initiatives. Here in the United States, the passing of the Patient Protection and Affordable Care Act mandates that employers provide accommodations for working mothers, such as break time and secluded locations to express milk up until one year postpartum (Hawkins, Stern, & Gillman, 2013). Regrettably, this federal

legislation only applies to women who are paid hourly or work for businesses with 50 or more employees (Smith-Gagen, Hollen, Walker, Cook, & Yang, 2014). This is a major issue specifically for over 5 million African American women employees of childbearing age residing in the United States (Smith-Gagen et al., 2014). As a result, Healthy People 2020 (2017) has advocated for a 38% increase in employee lactation support programs as a supportive work environment may improve breastfeeding duration (Hawkins et al., 2014).

However, one must take into account that the choice to breastfeed is often reliant upon one's socio-economic status, family structure, educational attainment, and self-perception (Blackwelder, 2014; Eni et al., 2014; Mathur & Dhingra, 2014). Some consider breastfeeding to be a fundamental component of children's rights that harvests the equal opportunity for supreme standards of health (Alipui, 2012). By placing emphasis on breastfeeding practices, the social determinants and environmental factors that influence one's health may become secondary. Disparities that directly correlate to child development are often evident at birth and continue to persist throughout the most critical years of a child's life (Alipui, 2012). Unfortunately, breastfeeding is repeatedly disregarded as a natural way to safeguard a child's nutrition and overall health status (McTeer, 2012).

In 2014, over 23,000 infants in the United States died before their first birthday (Centers for Disease Control and Prevention, 2016b). For African Americans, infant mortality rates are 2.4 times higher than Whites, in which 12.67 Black babies are pronounced dead for every 1000 live births (Centers for Disease Control and Prevention,

n.d.; Green, 2016). Although it is well known that infant mortality is a direct measure of health and wellbeing, many neglect the fact that breastfeeding continuation practices can be used to decrease infant mortality by 720 deaths each year with minimal risk (Robinson, VandeVusee & Foster, 2016). As a result, breastfeeding initiatives should be a focal point for improving infant health outcomes altogether.

Breastfeeding Among African American Women

African American women make up a subset of the population that is least likely to breastfeed (Mattox, 2012; Spencer & Grassley, 2012, Spencer et al., 2014). In the United States, only 27.5% of Black women breastfeed for a baby's first 6 months of life compared to 44.7% of White women and 46% of Hispanic women (Mattox, 2012). In a recent study, researchers claim that African-American women were nearly half as likely to breastfeed for at least 6 months when compared to Whites, even when there were provisions to provide break-times from work (Smith-Gagen et al., 2014). Furman et al. (2013) discovered that the majority of low-income African American women preferred to bottle-feed and considered breastfeeding to be an anomaly. Coincidentally, the most prominent health disparities and associated illnesses in black children are a direct correlation to the protective features of breastfeeding (Chapman & Escamilla, 2012).

Many African American women in the United States who live below poverty level also have the highest incidence of unintended pregnancies compared to White and Hispanic women (Ramos, 2012). This may serve as a possible cause of the low rates of breastfeeding, as women who become pregnant unexpectedly may also have less intent to breastfeed. Furthermore, in North Carolina low-income Black women were found to give

their infants 10 times more soda and sweet tea than breast milk by 18 months of age (Thompson & Bentley, 2012). With lower rates of breastfeeding, a mother's decisions regarding food and nutrition become the precursor for the promotion of child health equity.

In a recent study using data from the Pregnancy Risk Assessment and Monitoring System, breastfeeding duration was extended among African American mothers when babies were breastfed within the first hour and exclusively fed on demand (Ahluwalia, Morrow, D'Angelo, & Li, 2012). Black mothers were also more likely to put their 2-month old infant to bed with a bottle and prop it up against something to refrain from active holding compared to White and Hispanic mothers (Perrin et al., 2014). These findings warrant the need for an improved understanding of the underlining causes of low breastfeeding rates among African American women. By increasing the initiation and duration of breastfeeding rates of women and children with the greatest need (Spencer & Grassley, 2012), there may be more positive health outcomes in the Black community, thereby lessening the health disparity gap.

Black Feminist Perspective of the Barriers to Breastfeeding

The historical significance of breastfeeding stems from "wet nursing" and "mammies" during slavery, in which Black women were forced to breastfeed their master's children in addition to their own (Gross, Powell et al., 2015; Mattox, 2012). This negative connotation may subconsciously play a role in the way that Black women perceive breastfeeding today. Spencer and Grassley (2012) believe that social and cultural factors are far more indicative of a Black women's likelihood to breastfeed. As

African American women are generally raised to value their pride, strength, and independence they may be less likely to seek help when encountering barriers while breastfeeding (Gross, Powell et al., 2015). With this in mind, there is a need to disseminate more culturally sensitive information that outlines common challenges and or barriers of breastfeeding (Eni et al., 2014; White, 2014).

Groups such as Mocha Moms and La Leche League promote the benefits of breastfeeding through education and social support, but the majority of African American women receive breastfeeding information from family and close friends (Mattox, 2012). It has been noted that including the father and one or more grandmothers of the newborn in the breastfeeding process has a positive impact on a mother's intent to breastfeed (Bomer-Norton, 2013; Furman et al., 2013; Mathur & Dhingra, 2014; Ware et al., 2014). Specifically, married low-income mothers were 3.47 and 4.08 times more likely to initiate and maintain any breastfeeding than women who were single respectively (Darfour-Oduro & Kim, 2014).

According to Banks, Kilpack, and Furman (2013) inner-city African American fathers expressed a desire to learn more about breastfeeding in order to offer better support and become more knowledgeable. Alternatively, mothers who make preparations and are confident in their abilities to breastfeed their infants are often very successful in doing so (Bomer-Norton, 2013; Spencer & Grassley, 2012). With collective support from the community, health organizations, and public advocacy, the social norms surrounding breastfeeding may change (Frick, Pugh, & Milligan, 2012; Mattox, 2012; White, 2014),

as a mother's decision to breastfeed is likely to be derived from the opinions and attitudes of the people closest to her (Eni et al., 2014).

Although Black women admitted to feeling a sense of pride when identifying with photos of celebrities, such as Beyoncé breastfeeding in public, there are very few positive images of Black women breastfeeding in the media and or the African American community (Gross, Powell et al., 2015; Mattox, 2012; Ware et al., 2014). Conversely, there have been other public figures that have shunned the act of breastfeeding, specifically in a public setting. Talk show host, Wendy Williams, described a woman's breasts as "sexual things" and has criticized several celebrities for breastfeeding their children in public (Green, 2016). Breastfeeding on demand is critical for maintaining an adequate supply of milk, yet African American women are being ridiculed for using their bodies according to their physiologic design (Green, 2016).

Eni et al. (2014) suggest that public health messages concerning breastfeeding should include the mother, the family, and the entire community. For example, In Memphis, Tennessee African American mothers and their families specifically stated that public nursing made them feel uncomfortable (Furman et al., 2013; Spencer & Grassley, 2012; Ware et al., 2014). This may pose a challenge to African American mothers who breastfeed because they may feel ashamed of breastfeeding or exposing themselves in a public location, which to them is deemed socially unacceptable. Additionally, the concept of sexuality and fear of sagging breast and pain were also considered to be barriers of breastfeeding (Furman et al., 2013; Spencer & Grassley, 2012; Ware et al., 2014).

Another barrier for African American women is that they return to school or work environments with poor lactation support several weeks sooner than their counterparts (Mattox, 2012; Spencer & Grassley, 2012; Ware et al., 2014; White, 2014), which may be influenced by the 1996 Welfare Reform's Personal Responsibility and Work Opportunity Act that forced mothers with children under the age of six to seek employment (Smith-Gagen et al., 2014). Similarly, some researchers believe that racial discrimination in health care or institutional racism could be an underlining aspect of breastfeeding disparities and health outcomes (Johnson, Kirk, Rosenblum, & Muzik, 2015). Perhaps the social dynamic of breastfeeding in the African American community is multi-tiered constituting of issues rooted in race, gender, economic hardship, family structure, and emotional imbalance. Despite the claims of researchers, culturally sensitive breastfeeding promotion strategies and interventions may be the budding model of behavior for racial and ethnic disparities.

Furthermore, a large percentage of African American women complained about the lack of information received from health care providers (Furman et al., 2013; Spencer & Grassley, 2012), which advocates the need for more specialized attention and patient-centered health communication. In Memphis Tennessee, Black women admitted that they were aware of the benefits of breastfeeding, but were unsure about the specific techniques of such (Ware et al., 2014). In other parts of the United States, women expressed that breastfeeding was a somewhat risky choice due to the possibilities of low milk supply, poor latching, and lack of confidence (Furman et al., 2013; Haroon, Das, Salam, Imdad, & Bhutta, 2013).

Women Infants and Children Nutritional Supplementation Program

The majority of breastfed infants in the United States are more likely to be White, have access to quality health care, and reside in a safe neighborhood with college-educated parents who have moderate to high levels of income (Colen & Ramey, 2014). These socio-economic factors are often the very essence of most health disparities and are a large part of the creation of the Special Supplemental Nutrition Program for Women, Infants, and Children, also known as WIC.

The WIC program was created in 1972 under the US Department of Agriculture to improve the health of pregnant, postpartum, and breastfeeding women and children up to age 5 living in poverty. The first site was established in 1974 in the state of Kentucky and has since then grown to become the third largest food supplementation program in the nation. The mission of WIC is to "safeguard the health of low-income women, infants, and children who are at nutritional risk," (National WIC Association, 2013). From a public health standpoint, WIC is a premiere program that is based on prevention, health education, referrals to social services, food benefit packages, peer counseling, and improved health care access for over 9 million women and children each month (National WIC Association, 2013).

Child WIC participants often have well-balanced diets that are high in iron, calcium, Vitamin C, and Vitamin B6 contributing to less cases of iron deficiency anemia (Baumgartel, Spatz, & American Academy of Nursing Expert Breastfeeding Panel, 2013; Chock, Hayes, & Tomiyasu, 2014). Furthermore, WIC has significantly improved birth outcomes, infant feeding behaviors, immunization rates, in addition to referral services

for domestic violence, substance abuse, and oral care (Chock et al., 2014). Overall, WIC has proven to be cost-effective as every dollar spent on a WIC mother saves $4.21 in Medicaid costs (Chock et al., 2014).

Below is an illustration of a public health model created by the WIC Association in 2013. The features of the model that directly pertain to this study are highlighted in bold font. For example, two public health problems outlined by the WIC Association are low breastfeeding rates and higher rates of stunted growth and development in children. These problems coincide with the purpose of this study, which is based on determining if there is an association between breastfeeding and maternal control over child nutrition and physical activity after 6 years. Because the WIC program caters to women with children up to 5 years, this study is a reflection of the true impact of the WIC program.

Because WIC was created to service low-income women, the behavioral and environmental risk factors are somewhat standard for all participants and consist of inadequate intake of nutritious food, inability to afford nutritionally adequate food, and lack of nutrition and health education and support. In order to assist women and children in overcoming these barriers, the WIC program provides nutrition and breastfeeding education and support, as well as nutritious food prescription packages. Consequently, the short-term outcomes of the WIC program are improved nutritional intake and diet as well as increased health knowledge about nutrition and breastfeeding. The long-term outcomes are adequate physical growth and cognitive development, increased breastfeeding rates, and reduced long-term health care costs.

WIC Public Health Model: Low-income Women, Infants, & Children

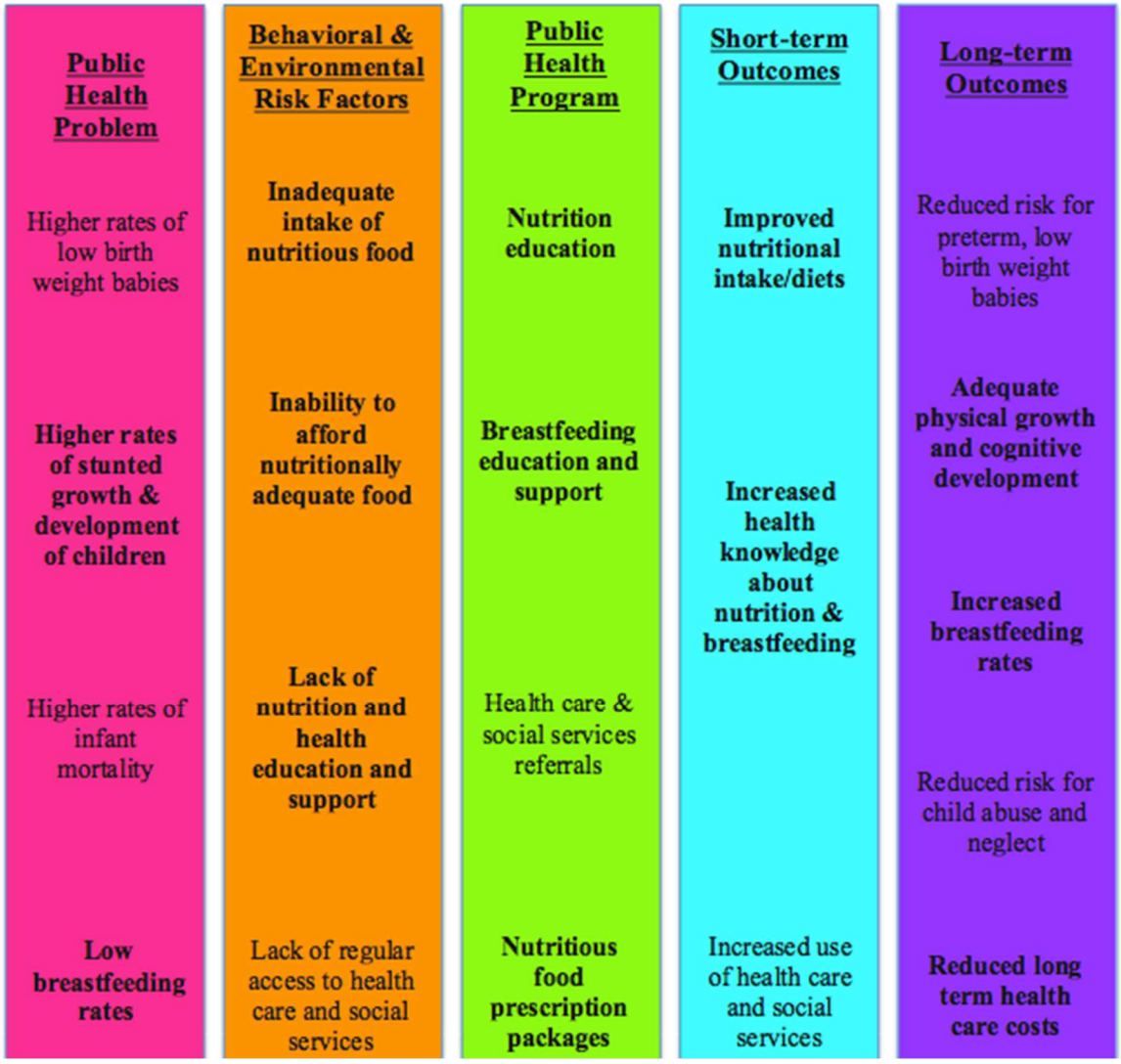

Figure 2. WIC public health model. "The Role of WIC in Public Health," by the National WIC Association, 2013. Electronically reproduced from https://s3.amazonaws.com/aws.upl/nwica.org/role_of_wic_public_health.pdf Adapted with permission.

Criticisms and Controversies of WIC and its Participants

In the past WIC has been criticized for its tactics involving infant formula in order to decrease infant mortality (Baumgartel et al., 2013; Chock et al., 2014; Whaley et al., 2012), but according to the National WIC Association (2013), women who have participated in its breastfeeding support activities have had longer breastfeeding duration. However, some researchers tend to disagree. In a recent WIC study, 60% of women had breastfeeding intentions, but less than 20% continued to breastfeed 2 months post delivery (Furman et al., 2013). In fact, Jensen (2012) concluded that there was a negative association between WIC participation and breastfeeding with the highest rates of breastfeeding duration being among WIC eligible non participants. This may be a result of WIC participants receiving free formula upon discharge from the hospital or lack of information concerning breastfeeding (Furman et al., 2013). Despite these conclusions, there are an overwhelming number of studies that have reported positive outcomes (Baumgartel et al., 2013; Whaley et al., 2012).

For example, WIC mothers who exclusively breastfed in the hospital shortly after giving birth were 8 times more likely to continue breastfeeding for at least 12 months compared to mothers who did not breastfeed in the hospital (Langellier et al., 2012). Although these findings seem promising in regard to future hospital breastfeeding policies, the large sample of WIC participants used for this study in California were predominately Latina and Hispanic, suggesting that these rates may not be representative of African American WIC participants in other parts of the United States.

With half of all infants born in the U.S. being enrolled in WIC (Jensen, 2012; Whaley et al., 2012) it is essential to understand the implications of program outcomes at the local, state, and federal level. WIC participants in Baltimore, Maryland were more likely to continue breastfeeding after 16 weeks as a result of peer counseling and motivational video segments compared to WIC participants who received minimal breastfeeding education (Spencer & Grassley, 2012; Ware et al., 2014). The breastfeeding peer counselor program trains former WIC participants who breastfed their infants to educate and encourage new breastfeeding WIC mothers (Campbell, Wan, Speck, & Harting, 2014; Gross, Powell et al., 2015; Spencer et al., 2014). In support of this claim, mothers who experienced symptoms of depression or feelings of isolation remained committed to breastfeeding when lactation consultants, peer counselors, home visitation, follow-up phone calls, and routine medical care were used in breastfeeding initiatives (Eni et al., 2014; Spencer & Grassley, 2012). Likewise, African American WIC participants who were members of breastfeeding support groups had stronger desires to breastfeed their infants compared to nonmembers (Spencer & Grassley, 2012).

In a qualitative study about breastfeeding support among WIC participants, 27% of mothers stated that they did not receive any information about breastfeeding until they visited a WIC facility (Cross-Barnet, Augustyn, Gross, Resnik, & Paige, 2012). In the same study, Cross-Barnet et al. (2012) claimed that 25% of the babies born by way of a cesarean delivery were given formula without parental consent. Correspondingly, WIC participants complained of receiving limited or inconsistent information about breastfeeding from different physicians while others were disappointed in the fact that

their concerns were not addressed in a respectful manner (Cross-Barnet et al., 2012; Spencer & Grassley, 2012).

These mixed findings call for a more thorough analysis of the WIC program and the affect it has on low-income African American women and children. Evidence suggests that a large percentage of Black women admitted that they felt most comfortable discussing topics regarding breastfeeding when they were able to partake in dialogue and make a personal connection (Spencer et al., 2014). For example, African American women had a 92.7% breastfeeding initiation rate when given culturally-based doula care (Cross-Barnet et al., 2012; Kozhimannil, Attanasio, Hardeman, & O'Brien, 2013). It may also be wise for breastfeeding programs to incorporate live breastfeeding observation where women have the opportunity to ask questions and learn techniques long before attempting to breastfeed their own babies.

Further, researchers in Wisconsin designed a qualitative study using focus groups to evaluate WIC's Breastfeeding Peer Counselor Program among African American mothers. The study indicated that African American WIC participants received valuable breastfeeding information from the peer counselor program and appreciated the truthfulness of the experiences that were shared from the peer counselors (Robinson et al., 2016). Not only did peer counselors validate the WIC participants' choices to breastfeed, they also increased mothers' confidence and determination, which helped counter negativity through constant support (Robinson et al., 2016).

In California the WIC Association developed a tool kit for women with low-wage jobs that outlined women's rights and breastfeeding accommodations in the workplace

(Jarris & Pliska, 2012), but the majority of Black WIC mothers were afraid to ask their employers to accommodate their breastfeeding needs (Gross, Powell et al., 2015), such as a private space, other than a public restroom with locking doors, and adequate storing facilities (Baumgartel et al., 2013). Regardless of the findings in the aforementioned studies, researchers should have strived for more randomized-controlled studies that focused on WIC programs at the national level.

Breastfeeding and Childhood Obesity

The social aspects of breastfeeding and the WIC program may serve as a lens of inquiry for other public health issues, such as childhood obesity, which has become a focal public health concern. Because obesity during childhood can linger into adulthood and lead to both physical and psychological issues consisting of diabetes, hypertension, musculoskeletal disorders, high cholesterol, cancer, cardiovascular disease, orthopedic problems, menstrual irregularities, sleep apnea, low self-esteem, anxiety, psychiatric disorders, and behavioral abnormalities (Lefebvre & John, 2014; Moss & Yeaton, 2014; Yan et al., 2014), there is an increasing demand for public health strategies that underline the leading determinants of such in high-risk populations.

According to the World Health Organization (2014) it is projected that there will be over 70 million overweight and obese children by the year 2025. Researchers estimate that over 2.8 million deaths are attributed to obesity each year (Yan et al., 2014), but the costs of obesity related expenditures might reach 18% by 2030 (Jones et al., 2014). In the United States, childhood obesity is a national priority that has been addressed through former First Lady Michelle Obama's Lets Move Campaign that targeted the prevention of

early childhood obesity through prenatal care, breastfeeding promotion, parental empowerment, healthy food options in schools, improved access to affordable healthy foods, and increased physical activity. The Lets Move Campaign was also reinforced through the White House Task Force on Childhood Obesity, which was an action plan based on 70 recommendations to increase public awareness and eradicate the obesity epidemic through short and long-term goals.

A growing body of evidence supports the protective claims of breastfeeding in regard to obesity prevention (Anderson et al., 2014; Grube et al., 2015; Jwa et al., 2014; Yan et al., 2014), but Lefebvre and John (2014) claim that this is a difficult concept to prove when studies fail to control for environmental and genetic factors (Jiang & Foster, 2013; Vafa, Moslehi, Afshari, Hossini, & Eshraghian, 2012). In a Japanese study of 41,572 babies born from 2001 to 2009 it was determined that boys who were exclusively breastfed for longer durations were less likely to be overweight and obese by their 7th or 8th birthday compared to children who were never breastfed, suggesting latent protection (McCrory & Layte, 2012) and a basis for divergent findings (Durmus et al., 2014).

Given that breastfeeding has been reported to reduce obesity by 22-24% (Davis, Whaley, & Goran, 2012), some researchers believe that breastfed infants learn to self-regulate their appetite and identify hunger gratification cues more readily than bottle-fed infants who rely on a caregiver (Davis, Whaley, & Goran, 2012; Li, Scanlon, May, Rose, & Birch, 2014; Moss & Yeaton, 2014). As a result, many bottle-fed infants are inadvertently being forced to consume an entire bottle of milk, which may set a precedent for overeating in childhood and adolescence (Moss & Yeaton, 2014).

Although breastfed siblings were found to be 13 pounds lighter as adolescents than those siblings who were not breastfed (Casazza, Fontaine, Astrup, Birch, & Brown 2013), some researchers believe that the relationship between breastfeeding and obesity is inconclusive, as there was no distinct association between the time in which complementary foods were introduced in infants who were overweight or obese (British Medical Journal, 2013; Pearce, Taylor, & Longley-Evans, 2013). However, there were conflicting results from a study based on the Early Childhood Longitudinal Study-Birth Cohort, in which breastfeeding and delaying solid foods until 4 months significantly lowered the likelihood of child obesity up until 18 years of age (Moss & Yeaton, 2014). Despite these findings, Zhou, Emerson, Husaini, and Hull (2014) believe that the benefits warranted for exclusive breastfeeding may be compromised when mothers choose to supplement with formula.

Considering that complementary foods should not be utilized until the tongue-thrust reflex is no longer evident or when a baby is able to sit up, chew, and form a bolus of food in the mouth to be swallowed (Pearce et al., 2013), low-income African American mothers were found to begin complementary feeding their infants as early as 2 months (Khalessi & Reich, 2013). Nonetheless, mothers who remained committed to breastfeeding for at least 4 weeks were more likely to adhere to the American Academy of Pediatrics recommendations of limiting sugary drinks and feeding infants appropriate amounts of fruits and vegetables within one year (Khalessi & Reich, 2013). Furthermore, children who were breastfed for at least one year and avoided sugar sweetened beverages were 60% less likely to be obese compared to children who were not breastfed and had 2

or more sugar sweetened beverages per day (Davis, Koleilat, Shearrer, & Whaley, 2014). Overall, these studies suggest that mothers who choose to breastfeed may be more likely to partake in healthier behaviors (Farley & Dowell, 2014).

A longitudinal study on New York WIC participants was carried out on over 50,000 children at 3 years of age. Researchers concluded that children were less likely to be obese when their mothers received additional nutritional package incentives for breastfeeding and when children watched less than 2 hours of television daily (Chiasson et al., 2016). Although recent studies have demonstrated significant decreases in childhood obesity among low-income WIC participants between the ages of two and four (Farley & Dowell, 2014), African Americans of low socioeconomic status are still disproportionately affected (Pan et al., 2013; Whaley et al., 2012; Wilkerson et al., 2015).

Because most children in the United States are not meeting the recommended servings of fruits and vegetables, it is important to look to the action of their caregivers (Rose, Savage & Birch, 2016). Researchers discovered that African American low-income mothers were least likely to breastfeed and provide fruits and vegetables for their children (Rose, Savage & Birch, 2016). In addition to this, Rose et al. (2016) claimed that maternal postpartum weight was directly correlated to the decisions surrounding milk and solid portions in an infant's diet. Therefore, improving breastfeeding rates among WIC families may serve as a multi-level strategy for promoting breastfeeding, tackling childhood obesity, and improving health outcomes in the Black community.

An Introduction to Maternal Influence and Early Feeding Practices

In light of women having biologically acquired the gift of producing milk by way of one's mammary glands, they also have the greatest influence on food-related behaviors, including food availability and mealtime practices as they pertain to the entire household (Byrd-Bredbenner et al., 2011; Kelishadi & Azizi-Soleiman, 2014; Moore & Bailey, 2013). Due to women being emotionally invested in satisfying their children's needs, it is warranted that the facilitation of the home environment and basic food parenting techniques be showcased as a primary construct for health behavior. For that reason, it is more than necessary to gain insight on how maternal factors could possibly lay an all- encompassing foundation for child development and family health outcomes.

According to DiSantis, Hodges, and Fisher (2013) mothers who breastfeed develop an innate level of sensitivity to an infant's nonverbal cues, which ultimately influences feeding frequency and behavior. In a cross-sectional analysis of 154 mothers, longer breastfeeding duration was directly related to increased responsiveness to infant satiety cues (DiSantis et al., 2013). As children rely on their parents to make food selections of appropriate portion and nutritional value, this study serves as an endorsement for exploring the concept of maternal control over child eating behaviors in middle childhood. Maternal feeding styles throughout the early stages of an infant's life can reflect a mother's beliefs, concerns, or social environment (DiSantis et al., 2013), however only two studies have examined the influence of feeding styles in children after 6 years.

Parents who bottle-fed their infants were more likely to ensure that their children ate all of the food off their plate at 6 years of age, yet these children were found to be two times more likely to abide by their parents demands compared to children who received less pressure to clear their dinner plates (Li, Scanlon et al., 2014). These results suggest that parental influence may be a strong indicator of eating patterns in childhood and possibly adulthood. In another study, researchers concluded that longer breastfeeding duration was a predictor of a healthier diet based on the Dietary Guidelines for Americans (Perrine, Galuska, Thompson, & Scanlon, 2014). Due to the exposure of various flavors from a mother's diet being transmitted through breast milk, children may be less picky or more willing to consume fruits and vegetables compared to formula fed children who are only exposed to very few flavors (Perrine et al., 2014; Shim, Kim, & Mathai, 2011). Regrettably, the aforementioned study conducted by Perrine et al. (2014) focused more on the food preferences of children rather than maternal influence.

After children are weaned from breastfeeding and begin to eat complementary foods, they are heavily influenced by the behaviors and decisions of their parents and caregivers. According to DiSantis et al. (2013) family meals are usually scheduled by way of a "social clock," rather than the hunger cues of individuals. Family meals that allow children to be involved in the preparation of food have resulted in positive attitudes toward healthy eating and increased consumption of fruits and vegetables (Horst, Ferrage, & Rytz, 2014; Kelishadi & Azizi-Soleiman, 2014). As a result, African Americans families who ate together 1-5 times per week and centered meals around healthy foods, communication, emotional support, and avoided punishment and or

pressuring tactics were found to have a lower risk of obesity after ten years (Boles & Gunnarsdottir, 2015). Even though eating in a group setting can cause one to be more aware of their food intake, family meals have also been associated with overall increased consumption (Herman, 2015).

Children raised in households where they were pressured to finish a meal, were more likely to ignore satiety and overindulge in pre-packaged snacks of low nutritional value (DiSantis et al., 2013; Thompson, Adair, & Bentley, 2013). On the other hand, children with parents who forcefully restricted foods were more concerned with food availability rather than hunger cues (DiSantis et al., 2013). Despite the notion that food-parenting practices can be complex, those that involve strategic communication and positive messages that emphasize the importance of maintaining healthy eating habits are ideal. Unfortunately, African American children often fall victim to parents who demonstrate low levels of control over feeding styles and are therefore more likely to be overweight compared to children whose parents use a more authoritative approach (Frankel et al., 2014; Thompson et al., 2013). These mixed findings demonstrate the need for a more detailed analysis of parental feeding behaviors, especially as it pertains to childhood obesity.

Because many low-income African American mothers identified larger infants as being healthy (Thompson et al., 2013), there may be some discrepancies in the ways that children are perceived in the Black community. For example, some cultural perceptions of obesity are distorted, in which a small frame or a lean physique is considered to be a sign of malnourishment or poor health (Dixon et al., 2012). This may be attributed to

mothers encouraging their children to eat more than necessary. On the other hand, some parents fail to acknowledge that their child is overweight or obese (Dixon et al., 2012; Schneider, Wilson, Ulrich, St. George, & Alia, 2013) possibly out of fear of causing harm (Gillespie et al., 2015). Based on these findings, culture seems to influence the perceptions of body image, parenting styles, as well as decisions surrounding food selections, and portion sizes. Hence, the home environment should be thoroughly evaluated in order to aid in the prevention of childhood obesity (Knowlden et al., 2015).

A Parent's Role as a *Gatekeeper*

During early childhood, the majority of one's time is spent inside the home; therefore, understanding the home environment is fundamental in assessing the impact of social and environmental factors on child health behaviors. Considering parents control the arrangement of the home space and the availability of technological devices such as computers, gaming systems, and televisions, they subliminally dictate the extent to which physical activity takes place (Jong et al., 2013; Maitland, Stratton, Foster, Braham, Rosenberg, 2013). As children spend over 47% of their time at home, researchers suggest that gardens, backyards, basketball hoops, and large open spaces should be prioritized inside the home in order to decrease sedentary behaviors (Maitland et al., 2013; Tandon et al., 2014). Overall, the home space can either promote or inhibit physical activity and sedentary behaviors; therefore the size and space of the home as well as parental restrictions are indicative of the ways in which children spend the majority of their time.

Because parents provide basic needs and children view their parents as role models (Moore & Bailey, 2013), health behaviors surrounding diet and exercise are

critical components of learning how to live a healthy lifestyle. Parents are *gatekeepers* of the home, their child's health, and the hierarchy that bridges the gap between individual and population based prevention strategies. For example, decreases in obesity prevalence have been more prevalent in younger children compared to their older counterparts, which may be a result of strict parental control on dietary behaviors (Farley & Dowell, 2014). However, Dixon et al. (2012) believe that obesity rates have increased in every age group with racial and ethnic disparities originating in infancy and the earliest years of life.

The evidence of low-income African American children being more likely to remain obese as adults (Demment, Haas, & Olson, 2014) and having higher blood pressures compared to other racial groups is primarily attributed to parental control (Dixon et al., 2012). Dattilo et al (2012) suggest that the weight status of children between the ages of two and six is the most accurate predictor of adult obesity, therefore public health interventions should be centered around parenting practices, education, and improving the health behaviors of parents altogether. Because environmental factors have maximum influence on behaviors and the physiology of the brain, adipocytes, and vital organs during early childhood (Dixon et al., 2012), parents should prioritize their diet and the manner in which they exercise for both themselves and their children. Children who participated in a family-based intervention took an additional 2117.6 steps when parents also increased their baseline step goals (Holm, Wyatt, Murphy, Hill, & Ogden, 2012). This indicates that children may be more motivated to be physically active when their parents are also involved.

Children are naturally inclined to model the behaviors of their parents; therefore parental influence is often emphasized in public health interventions designed for improved dietary practices and physical activity levels in children. Restricting foods in the home and transporting children to activities are some ways to promote healthy eating and regular exercise, but it is the actual behavior of the parent that has the most impact on a child (Dickens & Ogden, 2014; Leary et al., 2013; Tandon et al., 2014). Although parental control can have adverse effects on one's behaviors, such as overeating, poor food regulation, and weight gain, it can also promote weight loss, improved self-control, and healthy eating (Dickens & Ogden, 2014). Alternatively, parents who promote active lifestyles by way of social support and modeling enhance adolescent's perceptions of self-efficacy, which directly correlates to physical activity (Cheng, Mendonca, & Cazuza de Farias Junior, 2014). Unfortunately, most studies concerning physical activity and nutrition have been cross-sectional in nature and fail to examine causality over time.

Numerous studies have identified various parenting strategies to evaluate eating practices (Frankel et al., 2014; Nowicka, Flodmark, Hales, & Faith, 2014; Thompson et al., 2013) and physical activity (Erkelenz et al., 2014; Hamilton, Thomson, & White, 2013; Saunders, Hume, Timperio, & Salmon, 2012) among children and adolescents (Schreiber et al., 2014; Schneider et al., 2013). Some researchers broadly categorize parenting styles as authoritarian, authoritative, permissive or indulgent, and uninvolved or neglectful (Kremers et al., 2013), while others used more generic terminology, such as monitoring, discipline, control, setting limits, and reinforcement (Pena et al., 2014).

Sleddens et al., (2014) developed a comprehensive parenting questionnaire that utilized five constructs to describe parenting styles including nurturance, overprotection, structure, behavioral control, and coercive control. These parenting styles were also used to examine children's diet and physical activity in a study that attempted to determine associations with child health behaviors (Philips, Sioen, Michels, Sleddens, & Henauw, 2014). Researchers concluded that parents with high levels of structure, nurturance, and behavioral control had children with better health behaviors compared to parents with more coercive and overprotective styles of parenting (Philips et al., 2014). Regardless of the classification of parenting and styles, future public health interventions should promote effective parenting techniques through a systems-based approach.

A Systems Approach to Integrating the Leading Indicators of Childhood Obesity: Physical Activity, Nutrition, and Poverty

The manner in which children become accustomed to active play, regular sleeping habits, and a variety of tastes of foods are all pertinent in the development of future healthy behaviors (Dixon et al., 2012). Children who are physically active at a younger age have a reduced risk for obesity in both elementary and high school (Dixon et al., 2012). Further, planning family meals, limiting screen time, and engaging in cardiovascular exercise has also been associated with lower rates of obesity (Dixon et al., 2012), higher academic attainment, and improved overall health (Aguilar, Vergara, Velasquez, Marina, & Garcia-Hermoso, 2015).

The most effective interventions for childhood obesity have been centered on the entire family and integrated nutrition, behavioral factors, and physical activity (Jones et

al., 2014; Kelishadi & Azizi-Soleiman, 2014; Moore & Bailey, 2013; Wilkerson et al., 2015). Moore and Bailey (2013) suggest that the involvement of at least one parent in interventions warrants successful health outcomes in children, as they are most receptive to parental guidance during their formative years.

Identifying strategies to overcome barriers in the home is crucial, but embracing the mechanisms for behavior change is far more promising in terms of child health outcomes. Adamo et al. (2014) suggest that initiatives that cater to children between the ages of 0–6 are the most cost effective strategies in regard to obesity prevention. Therefore, exploring the benefits of breastfeeding in relation to physical activity and nutrition may provide evidence-based guidelines for the promotion of healthy lifestyles among children.

According to Gillespie et al. (2015) parents believed that they should take responsibility for helping their children with overweight and obesity issues. However, studies indicate that the financial costs of organized sports and healthy foods, as well as the influence of family members, were all considered to be barriers in regard to parents facilitating a healthy lifestyle (Groth & Morrison-Beedy, 2013; Wilkerson et al., 2015). African American children interviewed in a qualitative study claimed that their parents were more strict than their grandparents when it came to eating at the table or having a dessert (Jones et al., 2014).

Researchers in New York City claim that some barriers can be overcome through the WIC program, as child participants are more likely to eat healthy, limit screen time, and participate in physical activities (Sekhobo et al., 2014). Additionally, some parents

complained that they were confused about purchasing healthy foods, because of ever-changing food recommendations or being unable to afford healthier options even with their WIC supplementation packages (Jones et al., 2014). This may be the reason for children believing that it was challenging to eat healthy foods in the comfort of their own home (Jones et al., 2014).

Despite the fact that the majority of parents want their children to be healthy, families residing in low-income neighborhoods often turn to food to aid in the relief of stress (Jones et al., 2014). Consequently, stress may also be an underlying factor in the reasoning for Black children watching television for longer periods of time, consuming more sugar sweetened beverages and fast food meals, and having the lowest levels of physical activity compared to white children (Dixon et al., 2012). By the time Black children reach seven years of age, they are twice as likely to be obese compared to white children (Taveras, Gillman, Kleinman, Rich-Edwards, & Rifas-Shiman, 2013). The reasons for this are complex and may be due to a combination of circumstances.

A multitude of studies suggest that low-income neighborhoods serve as a hub of segregation that harbors limited access to supermarkets that provide fresh fruits and vegetables while the overabundance of convenient stores that cater to calorie dense and processed foods are streamlined and advertised as being more conducive to a hectic lifestyle (Dixon et al., 2012). Some researchers believe that individuals who live in close proximity to a supermarket consume more fruits and vegetables in addition to soda, juice, sweets, and snacks high in sodium (LeDoux & Vojnovic, 2014). Conversely, Vachaspati, Lloyd, DeLia, Tulloch, & Yedidia (2013) claim that children who lived close to a

convenience store were twice as likely to be obese, whereas children who lived near a park were less than half as likely to obese.

In contrast, other studies have alluded to claims of faulty research in supporting the notion that food environments influenced obesity prevalence among 5th and 8th grade students (Shier, An, & Sturm, 2012). Families that are restricted to an allotted budget are more prone to seek out opportunities for maximizing food quantities and purchasing items that can be readily stored, which often lack nutritional value (LeDoux & Vojnovic, 2014). Similarly, exercise facilities and parks are either scarce or poorly utilized due to the perception of safety in the physical environment. Children who reside in low-income neighborhoods are often exposed to stressful situations (Demment et al., 2014; Walton, Simpson, Darlington, & Haines, 2014) and have limited access to resources that promote healthy behaviors (Halliday, Palma, Mellor, Green, & Renzaho 2014).

Poverty among children in the United States is a leading indicator of poor health outcomes. Food insecurity in chaotic environments can cause symptoms of anxiety, depression, and impaired eating behaviors that increase one's risk for obesity (Fonseca, 2014). For example, children who consume soda every day have been found to be more aggressive, socially withdrawn, and suffer from attention deficit disorders (Fonseca, 2014), while African American children who consumed any fast food by age 3 were three times more likely to be obese (Davis et al., 2014). Given that children who receive larger food portions consume more food and are more likely to be overweight (Nicklas et al., 2013), children with limited food availability tend to eat energy dense foods of poor quality that also increase one's risk of obesity (Gross, Mendelsohn, Fierman, Racine, &

Messito, 2012). Because a poor diet can counteract the potential benefits of breastfeeding (Peneau, Hercberg, & Rolland-Cachera, 2014) it is important to take heed to the early years of a child's diet and nutrition. These years are most dependent on the choice of the parent and the manner in which food is presented.

African American culture is heavily influenced by foods and the socialization of eating. Feeding one's family is an expression of love and many women take pride in how well they can cook and the amount of food that is eaten often is a representation of such. Low-income Black mothers tend to cater to their children by preparing meals that they enjoy and provide large portions (Vollmer & Mobley, 2013). However, some mothers are not as fortunate to be able to prepare meals on a regular basis.

Low-income parents in Houston, Texas complained about the number of fast-food options in their neighborhoods and the limited amount of time to prepare meals at home due to working long hours (Mama, Soltero, Ledoux, Gallagher, & Lee 2014). For some African American pregnant women enrolled in the WIC program, eating fast food was considered to be a way of life (Groth & Morrison-Beedy, 2013), but others used it as a reward or to manage child behavior (Fisher et al., 2015; Jones et al., 2014). In regard to physical activity, parents admitted that television was a safer option for their children because they could keep an eye on them rather than having them in the streets (Mama et al., 2014).

Although, television may be used to safeguard children in poverty-stricken neighborhoods, it can also impact physical activity and the way children perceive food. The American Academy of Pediatrics (2015) recommends that children under the age of

two refrain from watching television, but 90% have been found to watch television daily (Dattilo et al., 2012). Moreover, Dixon et al. (2012) concluded that children under seven are exposed to 2:23 minutes of food advertisements every hour. As a result, the food preferences of children could be more heavily influenced by television rather than that of a parent or caregiver. Meanwhile, researchers discovered that eating meals in front of the television disrupts satiety signals to the brain and leads to increased food intake (Herman, 2015).

Screen time also influences how often children engage in active play as many children fail to engage in the recommended 180 minutes of physical activity per day. Nonetheless, studies indicate that toddlers who were physically active with their mother at 9 months were more likely to continue to do so at 19 months (Hnatiuk, Salmon, Campbell, Ridgers, & Hesketh, 2013). As a result, children who participate in activities with their parents have a greater likelihood of adopting those behaviors long-term. These tactics could be used in the strategic planning of public health interventions designed for women and children.

Moreover, adolescents who received support from their parents were found to be 60% more likely to be physically active than those who received little to no support (Mendonca & Cazuza de Farias Junior, 2015). When support was coupled with incentives, encouragement, and motivational comments or praise the confidence levels of teens increased significantly (Mendonca & Cazuza de Farias Junior, 2015). Although the sample for this study was primarily made up of adolescents between the ages of 14 and 19, the findings may also apply to younger populations. Overall, parental supportive

behaviors are directly related to physical activity levels in children and adolescents (Nolan, Cottrell, & Dino, 2013), especially among African Americans (Baskin et al., 2013).

Summary

This review of the literature provides background information on breastfeeding, the WIC program, as well as childhood obesity and maternal feeding styles. By examining these concepts both individually and collectively this study may set a precedent for enhancing current breastfeeding promotion programs through WIC and other public health initiatives. In New Mexico, WIC nutritionists utilized several tools, including a report card /action plan that used a traffic light system to categorize BMI percentiles and help families set health goals through a contract, a nutrition activity self-history questionnaire that provided information about medical history and health behaviors, visual prompts that depicted images of ideal behaviors, and a healthy weight poster to help parents not only think about their child's weight, but discuss it with a WIC counselor (Herrera et al., 2013). These were all used to help to facilitate nutrition counseling in a supportive environment without offending parents. Due to the success of these tools, it may be advantageous to build upon or use similar strategies to promote breastfeeding and prevent childhood obesity altogether.

In 2009 the New York WIC food package was revised in hopes of combating childhood obesity. Because milk for children less than 2 years of age was restricted and WIC participants were required to attend breastfeeding promotion/peer counseling programs, obesity rates drastically reduced (Chiasson et al., 2016). Although these

findings support the justification for the need of this study, they also highlight the importance of public health policy in regard to the prevention of childhood obesity through exclusive breastfeeding practices.

It may also be ideal to make the WIC peer counselor program more mainstream as it has been extremely successful in improving breastfeeding rates among African American women by way of one-on-one support from former breastfeeding WIC participants (Baumgartel et al., 2013; Campbell et al., 2014). As women's decisions to initiate breastfeeding were directly correlated with WIC peer counseling (Campbell et al., 2014) and infant nutrition being a vital component of the WIC program, it is more than necessary to capitalize on the efforts of WIC to potentially market breastfeeding as the epitome of primary prevention.

In essence, few studies have examined early childhood obesity prevention. The majority of studies associated with breastfeeding did not evaluate child eating behaviors beyond 2 years of age and were retrospective in nature. Also, of the two studies that examined maternal feeding styles and child health behaviors at 6 years of age, neither specifically examined the potential association between breastfeeding practices and the concept of maternal control over child diet and physical activity levels (Li, Scanlon et al., 2014; Perrine et al., 2014). This gap in the literature has been addressed among a subset of the population consisting of African American WIC participants.

Considering that parental feeding styles can be both the cause and effect of childhood obesity, (Thompson et al., 2013) an improved understanding of exclusive breastfeeding and the maternal influence associated with child health behaviors in low-

income African American populations shows merit, as the rates of childhood obesity could possibly decrease through the provision of public health initiatives designed for women and children of all races and socioeconomic backgrounds.

In Chapter 3, I will discuss several components of the research design and target population in detail. This will include the research questions, variables for study, hypotheses, and methodology used to conduct a quantitative secondary analysis of the IFPS II and its Y6FU. In Chapter 4, I will discuss the results of the study and provide insight on how hypotheses were tested. Finally, Chapter 5 will consist of an interpretation of the findings, implications for social change, and recommendations for future study.

Chapter 3: Research Methodology

Introduction

The purpose of this study was to assess the possibility of an association between exclusive breastfeeding and maternal control over child health behaviors among African American women enrolled in the Women Infants and Children Nutritional Supplementation Program after 6 years. According to the American Academy of Pediatrics (2012), exclusive breastfeeding is the normative model of infant feeding in which optimal nutrition is provided. There are widespread benefits for both women and children, and it is one of the most natural forms of primary prevention. For years breastfeeding has challenged the personal philosophies and lifestyle choices of women, but few researchers have explored its impact on child health behavior.

In the previous chapter, I introduced and described the concept of maternal control within the realm of childhood eating behaviors and physical activity. For this study, maternal control was implied through a mother's decision to exclusively breastfeed her infant. Because most women's decision to breastfeed is due to the health needs of their child (Spencer & Grassley, 2012), it is possible that these same decision making properties may also influence how women choose to feed and physically interact with their children long-term. With this in mind, I used exclusive breastfeeding initiation as a medium to explore the concept of maternal control in regard to child health behaviors, given that a mother's jurisdiction over her child's diet and activity levels is a direct marker of maternal control.

This chapter will include a description of the research design, the study population, sampling procedures, instrumentation and operationalization of constructs, and the data analysis plan. I will also address the threats to both internal and external validity along with the ethical procedures that I used to safeguard patient rights.

Research Design and Rationale

I used a quantitative longitudinal design to identify any patterns of association between exclusive breastfeeding and maternal control over child health behaviors. For this study, exclusive breastfeeding was determined by breastfeeding initiation and duration in which mothers solely supplied breast milk to their infants at 3 and 6 months. Maternal control over child health behavior was measured by specific eating behaviors and physical activities that collectively involved both the mother and child. For example, eating behaviors were based on the occurrence of family meals, fast food consumption, and fruit and vegetable availability in the home. Lastly, I evaluated physical activity by the frequency and intensity of athletic or recreational play. The demographic covariates of age, education, marital and employment status, parity, and household income were controlled for and or adjusted.

I used secondary data from the IFPS II and its Y6FU in hopes of understanding how a mother's breastfeeding practices could be used to classify the determinants that ultimately dictate child health outcomes. There was a need for more research on breastfeeding and childhood obesity disparities that disproportionately affect African Americans. I addressed this gap in the literature by conducting this study on Black women enrolled in the WIC program after 6 years. Researchers often use secondary data

to study an entire population, which increases the degree to which the results can be generalized (Johnston, 2014). Subsequently, I determined that a quantitative approach was most suitable for this study because this method is intended to test hypotheses through deductive reasoning and statistical analysis (Teddlie & Tashakkori, 2009). Although quantitative studies are based on empirical observations, their fundamental purpose is to examine the relationships between variables through standardized procedures that can be replicated and controlled (Teddlie & Tashakkori, 2009).

I used a longitudinal design in order to identify the presence of an association between the study variables. Many researchers have used longitudinal designs to determine the prevalence of health conditions, exposures, and demographic characteristics of a population over an extended period of time (Institute for Work and Health, 2015). Moreover, the use of secondary data was critical for generalizing the findings from this study in hopes of contributing to the paucity of knowledge surrounding the disparities associated with breastfeeding and childhood obesity. In order to obtain the primary dataset, I submitted a request to the Centers for Disease Control and Prevention through e-mail, which included a short letter of intent and the proposed research questions for study. The contact person at the Centers for Disease Control and Prevention provided the SAS raw data files, codebooks, and a user's manual for reference. Codebook variables were examined in order to ensure the assessment of the research questions of interest. I did not access the data until I had received committee and formal institutional review board (IRB) approval.

Description of Research Variables

I derived the research variables for this study from the Infant Feeding Practices Study and its Year Six Follow Up. The independent variable is defined as:

Exclusive breastfeeding for 3 and 6 months: When infants are solely fed breast milk from his or her mother and no other food or liquid for the recommended first 3 and 6 months of life (UNICEF, 2015).

The covariates or control variables were defined as:

Maternal age: The age of the mother at the time of delivery, measured in years.

Maternal education: The highest level of schooling that was completed by the mother, categorized by grade level.

Maternal employment status: The degree to which the mother had a full or part-time job outside of the home.

Maternal household income: The total gross income of all members of a household or place of residence

Maternal marital status: The mother's condition of being married or single.

Maternal parity: The number of pregnancies carried to term (37–42 weeks) by the mother and resulted in a live birth.

The dependent variables were defined as:

Maternal control over eating behavior: The extent to which a mother will oversee, monitor, restrict, or encourage a child's nutritional practices that include food portion control and frequency, food and beverage intake and preference, food

combinations, etiquette, and meal and snack patterns (Frankel et al., 2014; Wroten et al., 2012).

Maternal control over physical activity: The extent to which a mother will oversee, monitor, restrict, or encourage a child to engage in any body movement produced by skeletal muscles that requires energy expenditure and enhances health; this may include walking, running, cycling, or recreational activities (World Health Organization, 2015)

Research Questions and Hypotheses

I used the variables outlined in the previous section to determine the association between exclusive breastfeeding and maternal control over eating behavior and physical activity among WIC participants after 6 years. The RQs and hypotheses for this study were as follows:

RQ1: Among African American WIC participants, is there an association between exclusive breastfeeding and maternal control over eating behavior in children within a 6-year period?

$H_0$1: Among African American WIC participants, there is no relationship between exclusive breastfeeding and maternal control over eating behavior in children within a 6-year period.

H_A1: Among African American WIC participants, there is a relationship between exclusive breastfeeding and maternal control over eating behavior in children within a 6-year period.

RQ2: Among African American WIC participants, is there an association between exclusive breastfeeding and maternal control over physical activity in children within a 6-year period?

$H_0$2: Among African American WIC participants, there is no relationship between exclusive breastfeeding and maternal control over physical activity in children within a 6-year period.

H_A2: Among African American WIC participants, there is a relationship between exclusive breastfeeding and maternal control over eating physical activity in children within a 6-year period.

I measured the independent variable of exclusive breastfeeding by breastfeeding duration at 3 and 6 months. The first dependent variable of maternal control over physical activity was measured by frequency or the number of days per week physical activity took place under the mother's care, while maternal control over eating behavior was based on eating habits that encompassed the frequency of family meals for both children and adults, fast food consumption, and fruit and vegetable availability in the home.

Sample and Study Population

In 2012, the year of the IFPS II's Y6FU, a WIC participant and program characteristic report indicated that there were 9,734,468 women, infants, and children enrolled in WIC nationwide (Johnson, Thorn et al., 2013). Only 19.8% of participants self-identified as African American, while the majority of mothers were between the ages of 18–34 (Johnson, Thorn et al., 2013). 74.6 % of women enrolled in the WIC program admitted to receiving benefits from at least one public assistance program, which deems

one income eligible for WIC (Johnson, Thorn et al., 2013). Furthermore, 70.8% of WIC clients used Medicaid benefits and 35.8% received Supplemental Nutrition Assistance Program (SNAP) benefits (Johnson, Thorn et al., 2013). The average WIC household was made up of 4.1 people with African American households averaging an annual income of $12,962 (Johnson, Thorn et al., 2013). Because WIC participants make up one of the most disadvantaged populations in the nation, two thirds of all participants reported incomes that were less than or equal to the federal poverty level (Johnson, Thorn et al., 2013). Moreover, in 2012, 67.1% of WIC children between the ages of 6 and 13 months were breastfed at some point, which supports the 60–79% breastfeeding initiation rates reported by WIC agencies throughout the United States (Johnson, Thorn et al., 2013).

According to the IFPS II data, 86.2% of Y6FU participants initiated breastfeeding, 65.1% were between the ages of 25–34, 83.7% were married or cohabitating, 67% were employed, 46.2% were college graduates, 42.2% had at least two children, 3.7% were African American and 31.9% were WIC participants. The majority of the respondents were more likely to be White, older in age, married, and less likely to have a low socioeconomic background. With this in mind, my secondary analysis for this study targeted the specific population of African American respondents who exclusively breastfed their infants up to 6 months and participated in the WIC program.

Power Analysis

In preparation for conducting this study, I calculated a power analysis in order to estimate the appropriate sample size that was required to reject the null hypothesis if and when the alternative hypothesis happens to be true. The parameters that were used

included the alpha, power, and effect size. The alpha was used as a marker for statistical significance, which is often standardized at 0.05 indicating that there is a 5% probability of rejecting the null hypothesis when it is indeed true (Department of Psychology, 2014). According to the Department of Psychology (2014) G-Power sample size calculating software, for a two-sided logistic regression, to detect an odds ratio of 1.3, with an alpha level of 0.05, with 80% power where the probability of Y = 1 and X = 1, the required sample size was 232.

Sampling Methods and Primary Source of Data

The sample for the IFPS II and its Y6FU is based on a consumer opinion panel in which 500,000 households throughout the United States were surveyed. Healthy women who were at least 18 years of age and gave birth at full or nearly term to a single infant were included in the study. Therefore, mothers who were expecting twins, under the age of 18, or had medical problems that prevented breastfeeding practices for more than 1 week were excluded from the study. In addition to this, infants who were born premature, stayed in an intensive care unit or had medical problems that affected feeding such as, down syndrome, cleft palate, dysphagia, pyloric spasms, or galactosemia were also excluded from the study.

All participants received the initial questionnaire in the mail during their third trimester. This was followed by a telephone interview around the time of the mother's expected date of delivery in order to verify the birth of the baby. Mothers received questionnaires each month for a total of 1 year and had a response rate between 63% and 83%. Six years later 2,958 mothers qualified for the Y6FU, which was determined by the

completion of the IFPS II's initial questionnaire and phone interview. The questionnaires from the Y6FU were matched to the infant data from IFPSII by participation number and verified through infant birth dates and maternal feeding characteristics. As a result, the sample size for the Y6FU was 1,542 with a 52.1% response rate.

The longitudinal IFPS II and the cross-sectional Y6FU collected data on child health and development, nutritional practices, screen time, physical activity, health insurance coverage, family medical history, and pertinent details related to home environment. The combination of these two designs warrants research that not only examines the intricacies of infant feeding practices, but it also provides insight on the subsequent impact on child development after 6 years. The most relevant data pertained to exclusive breastfeeding initiation and duration as well as childhood nutritional practices and physical activity.

Operationalization of Variables

Independent Variables

The IFPSII surveys were administered each month and asked mothers several questions regarding their breastfeeding practices. In order to determine exclusive breastfeeding initiation until hospital discharge three questions were posed from the IFPSII: NEONATAL SURVEY SECTION B: entitled YOU AND YOUR BABY IN THE FIRST FEW WEEKS. Question 18, "Did you ever breastfeed or try to breastfeed your baby, either in the hospital or birth center, or after you went home?" was used to determine breastfeeding initiation. Responses were recoded 0 = No and 1 = Yes as a dichotomous categorical variable. Under the same section, Question 29 "While you were in the hospital or birth center, was your baby fed water, formula, or sugar water at any time?" was used to determine if mothers were feeding their infants anything other than breast milk. Responses were recoded 0 = Yes and 1 = No as a dichotomous categorical variable. Question 33, "When you left the hospital or birth center, how were you feeding your baby?" determined if mothers were continuing to exclusively breastfeed upon discharge from the hospital. Responses were recoded 0 = Other feeding and 1 = Breastfeeding only as a dichotomous categorical variable. Because there was no question that directly asked participants if they exclusively breastfed their infants during their stay in the hospital, these three questions were collectively chosen by researchers in the primary dataset, which is indicated in the IFPSII Data Handbook.

For this study, exclusive breastfeeding was measured at month 3 and month 6, in which the IFPSII: MONTH 3 and MONTH 6 SURVEYS was used. Considering that

there was no survey question that directly asked participants if they exclusively breastfed at 3 and 6 months, two questions were chosen by the researchers in the primary dataset to determine exclusive breastfeeding at 3 and 6 months, which is indicated in the IFPSII Data Handbook. Under SECTION A: entitled BABY'S FEEDING AND HEALTH Question 1,"In the past 7 days, was your baby fed each of the foods listed below?" determined if mothers were feeding their infants anything other than breast milk by way of a food frequency chart. Responses were recoded 0 = Non-breast milk and 1 = Breast milk only as a dichotomous categorical variable. As soon as participants indicated that they were no longer breastfeeding, they were asked to provide the age of their infant at the time of breastfeeding cessation. This information was taken from IFPSII: MONTH 3 and 6 SURVEYS: SECTION B: entitled STOPPED BREASTFEEDING. Question 5, "How old was your baby when you completely stopped breastfeeding and pumping milk?" response categories for the 3 month survey were recoded as < 3 months = 0 and ≥ 3 months of breastfeeding = 1 as a dichotomous categorical variable. Conversely, response categories for the 6 month survey were recoded as < 6 months = 0 and ≥ 6 months = 1 as a dichotomous categorical variable.

Table 1

Operational Definitions

Operational Definition	IFPSII Survey Question	Variable Coding	Answer Choices	Recoded Variables
Independent Variables				
Exclusive breastfeeding until hospital discharge	18. Did you ever breastfeed or try to breastfeed your baby in the hospital or birth center, or after you went home?	HOSPEXBF	1=Yes 2=No Q=No data	Recode 18. (1=1) (2=0) (Q=M) 0=No 1=Yes M=No data
	29(a). While you were in the hospital or birth center, was your baby fed water at any time?	HOSPEXBF	1=Yes 2=No 3=Don't Know Q=No data	Recode 29(a). (1=0) (2=1) (3=M) (Q=M) 0=Yes 1=No M=No data
	33. When you left the hospital or birth center, how were you feeding your baby?	HOSPEXBF	1=Breastfeeding only 2=Formula feeding only 3=Both breastfeeding and formula feeding Q=No data	Recode 33. (1=1) (2=0) (3=0) (Q=M) 0=No 1=Yes M=No data
Exclusively breastfeeding infant at 3 months of age	1. In the past 7 days, was your baby fed each of the foods listed below?	M3EXBF	1=Breast milk 2=Formula milk 3=Cows Milk 4=Other Milk Q=No data	Recode 1. (1=1) (2=0) (3=0) (4=0) (Q=M) 0= No 1=Yes M=No data

(Table Continues)

Operational Definition	IFPSII Survey Question	Variable Coding	Answer Choices	Recoded Variables
Exclusively breastfeeding infant at 3 months of age	5. How old was your baby when you completely stopped breastfeeding and pumping milk?	M3EXBF	0=Not marked 1=Marked Q= No data	Recode 5. (0=1) (1=1) (1=0) (Q=M) 0= No 1=Yes M=No data
Exclusively breastfeeding infant at 6 months of age	1. In the past 7 days, was your baby fed each of the foods listed below?	M6EXBF	1=Breast milk 2=Formula milk 3=Cows Milk 4=Other Milk Q=No data	Recode 1. (1=1) (2=0) (3=0) (4=0) (Q=M) 0= No 1=Yes M=No data
	5. How old was your baby when you completely stopped breastfeeding and pumping milk?	M6EXBF	0=Not marked 1=Marked Q= No data	Recode 5. (0=1) (1=1) (1=0) (Q=M) 0= No 1=Yes M=No data

(Table Continues)

Operational Definition	Y6FU Survey Question	Variable Coding	Answer Choices	Recoded Variables
Dependent Variables				
Maternal control over physical activity	1. In a typical week, how many days do you or another adult in your household do any physical activities with your 6-year old, including things like active games, sports, walks, biking, ice skating, swimming, or other physical activities? Please include only activities where both the adult and the 6 year old are active.	Y6c1	0=0 days 1=1 day 2=2 days 3=3 days 4=4 days 5=5 days 6=6 days 7=7 days N= No Answer	Recode 1. (0=0) (1=0) (2=0) (3=0) (4=1) (5=1) (6=1) (7=1) (N=M) 0=No 1=Yes M=No Answer
	2. In a typical week, how many days is your 6-year-old physically active for a total of at least 60 minutes per day? Add up all the time your 6-year-old spends in any kind of physical activity that makes him or her sweat or breathe hard (for example, playing tag, running, biking, jumping rope, swimming). If your child is active during recess, please include recess time.	Y6c2	0=0 days 1=1 day 2=2 days 3=3 days 4=4 days 5=5 days 6=6 days 7=7 days N= No Answer	Recode 2. (0=0) (1=0) (2=0) (3=0) (4=1) (5=1) (6=1) (7=1) (N=M) 0=No 1=Yes M=No Answer
Maternal control over eating behavior	5. How many days a week does your 6-year-old usually eat dinner at home with you or another adult in your household?	Y6d5	2=2 days 3=3 days 4=4 days 5=5 days 6=6 days 7=7 days N= No Answer	Recode 5. (0=0) (1=0) (2=0) (3=0) (4=1) (5=1) (6=1) (7=1) (N=M) 0=No 1=Yes M=No Answer

(Table Continues)

Operational	Y6FU Survey	Variable	Answer	Recoded

Definition	Question	Coding	Choices	Variable
Maternal control over eating behavior	6. How many days a week does your 6-year-old usually eat dinner from a fast food restaurant like McDonald's, Taco Bell, Pizza Hut, etc., including take-out?	Y6d6	0=0 days 1=1 day 2=2 days 3=3 days 4=4 days 5=5 days 7=7 days N= No Answer	Recode 6 (0=1) (1=1) (2=1) (3=1) (4=0) (5=0) (6=0) (7=0) (N=M) 0=No 1=Yes M=No Answer
	14. (a) How often are there fruits or vegetables to snack on in your home, such as apples, raisins, carrots, celery, bananas, or melon?	Y6d14a	1=Never 2=Rarely 3=Sometimes 4=Often 5=Always N=No Answer	Recode14(a) (1=0) (2=0) (3=1) (4=1) (5=1)(N=M) 0=No 1=Yes M=No Answer
	15. (a) I make sure that my child does not eat too many sweets or junk foods.	Y6d15a	1=Disagree 2=Slightly Disagree 3=Neither 4=Slightly Agree 5=Agree N=No Answer	Recode15(a) (1=0) (2=0) (3=0)(4=1) (5=1)(N=M) 0=No 1=Yes M=No Answer

(Table Continues)

Operational Definition	IFPSII Survey Question	Variable Coding	Answer Choices	Recoded Variables
Control Variables				
Maternal age	9. What is your age in years?	P9	1=18-24 2=25-29 3=30-34 4=35+ N=No Answer	Recode 9. (1=1)(2=2) (3=2)(4=3) (N=M) 1=18-24 2=25-34 3=35+ M=No Answer
Maternal parity	41. How many other babies have you had when younger than 12 months old? Do not include the baby you are expecting.	P41_1	0=0 1=1 2=2 3=3 4=4 5=5 6=6 7=7 8=8 9=9 10=10 11=11 12=12 N=No Answer	Recode 41. (0=0)(1=1) (2=2)(3=3) (4=3)(5=3) (6=3)(7=3) (8=3)(9=3) (10=3)(11=3) (12=3)(N=M) 0=0 1=1 2=2 3=3+ M=No Answer
Maternal race	6. What is the race of the female head of the household?	RACE	1=White 2=Black 3=Asian Pacific Islander 4=Other N=No Answer	(1=0)(2=1) (3=0)(4=0) (N=M) Other=0 Black=1 M=No Answer

(Table Continues)

Operational Definition	IFPS II Survey Question	Variable Coding	Answer Choices	Recoded Variables
Maternal marital status	14. What is the marital status of the female head of the household?	MARITAL	1=Married 2=Widowed 3=Divorced 4=Separated 5=Never Married N=No Answer	Recode 14 (1=1)(2=0) (3=0)(4=0) (5=0)(N=M) 0=Not Married 1=Married M=No Answer
Maternal household income	2.2 Please "X" the box which best describes the total yearly income of all members of your household before taxes	INCOME	1=Under 5K 2=5-9,999K 3=10-19,999K 4=20-29,999K 5=30-39,999K 6=40-49,999K 7=50-59,999K 8=60-69,999K 9=70-99,999K 10=100K+ N=No Answer	Recode 2.2 (1=1)(2=1) (3=1)(4=2) (5=2) (6=3) (7=3)(8=4) (9=4)(10=4) 1= < 20K 2= 20-40K 3= 40-60K 4= 60K+ M=No Answer
WIC participation	7 (a) In the past month, were you enrolled in the WIC program or did you get WIC food or food vouchers?	M3J7_1	1=Yes 2=No N=No Answer	Recode 7(a) (1=1)(2=0) (N=M) 0=No 1=Yes M=No Answer
	7 (b) In the past month, was your baby enrolled in the WIC program or did you get WIC food or food vouchers for your baby?	M3J7_2	1=Yes 2=No N=No Answer	Recode 7(b) (1=1)(2=0) (N=M) 0=No 1=Yes M=No Answer

(Table Continues)

Operational Definition	IFPSII Survey Question	Variable Coding	Answer Choices	Recoded Variables
WIC participation	5 (a) In the past month, were you enrolled in the WIC program or did you get WIC food or food vouchers?	M6J5_1	1=Yes 2=No N=No Answer	Recode 5(a) (1=1)(2=0) (N=M) 0=No 1=Yes M=No Answer
	5(b) In the past month, was your baby enrolled in the WIC program or did you get WIC food or food vouchers for your baby?	M6J5_2	1=Yes 2=No N=No Answer	Recode 5(b) (1=1)(2=0) (N=M) 0=No 1=Yes M=No Answer
Maternal education	17. Please indicate the highest level of education completed by the female head of the household	EDUC	1=1-7 years grade school 2=8 years grade school 3=1-3 years high school 4=High school graduate 5=1-3 years college 6=College Graduate 7=Post graduate N=No Answer	Recode 17 (1=1)(2=1) (3=1)(4=2) (5=3)(6=4) (7=4)(N=M) 1=Less than High school 2=High school graduate 3=Some College 4=College Graduate M=No Answer

(Table Continues)

Operational IFPSII Survey Variable Answer Recoded

Definition	Question	Coding	Choices	Variables
Maternal employment status	8. Is the female head of the household employed?	EMPLOY	1=Works for someone else full time 2=Temporarily unemployed 3=Self employed 4=Works for someone else part time only 5=Retired and not employed 6=Disabled, student, etc. and not employed 7=Full time homemaker N=No Answer	Recode 8 (1=1)(2=0) (3=2)(4=1) (5=0)(6=0) (7=2)(N=M) 0=Unemployed 1=Employed 2=Works at Home M=No Answer

Dependent Variables

In order to determine maternal control over physical activity two questions from the IFPS II's Year 6 Follow Up were used. Under SECTION C: Question 1 states,

> "In a typical week, how many days do you or another adult in your household do any physical activities with your 6-year-old, including things like active games, sports, walks, biking, ice skating, swimming, or other physical activities? Please include only activities where both the adult and your 6-year-old are active."

This question provided information on how often mothers engaged in physical activity with their child. This directly measured the concept of maternal control over physical activity as respondents were only asked to include activities where both the mother and child were actively participating together.

Responses were recoded 0–3 days of physical activity = 0 and 4–7 days of physical activity = 1 as a dichotomous categorical variable. Question 2 reads as follows,

> "In a typical week, how many days is your 6-year-old physically active for a total of at least 60 minutes per day? Add up all the time your 6-year-old spends in any kind of physical activity that makes him or her sweat or breathe hard (for example, playing tag, running, biking, jumping rope, swimming). If your child is active during recess, please include recess time."

This question provided insight on how often children were encouraged to take part in rigorous exercise each day, which specifically coincided with maternal control over physical activity. Responses were recoded 0–3 days of at least 60 minutes of physical activity = 0 and 4–7 days of at least 60 minutes of physical activity = 1 as a dichotomous categorical variable.

Maternal control over eating behavior was the primary focus of this study, due to its potential association to exclusive breastfeeding practices. In order to determine such, several questions from the Y6FU were used. Under SECTION D: Question 5, "How many days a week does your 6-year-old usually eat dinner at home with you or another adult in your household?" determined how often mothers prepared meals for their children and consumed those meals as a family. Responses were recoded 0–3 days eating at home as a family = 0 and 4–7 days eating at home as a family = 1 as a dichotomous categorical variable. In order to measure the frequency of fast food consumption Question 6 from the Y6FU was used, "How many days a week does your 6-year-old usually eat dinner from a fast food restaurant like McDonald's, Taco Bell, Pizza Hut, etc.,

including take-out?" Responses were recoded 0–3 days of fast food per week = 1 and 4–7 days of fast food per week = 0 as a dichotomous categorical variable.

Considering that children 6 years of age do not purchase their own meals, the frequency in which children eat fast food is a result of the choices made by one's caregiver and thereby is a contributing factor of maternal control. On the other hand, Question 14(a), "How often are there fruits or vegetables to snack on in your home, such as apples, raisins, carrots, celery, bananas, or melon?" indicated how the actions of health conscious mothers who purchased nutritious foods for their household, served as proponents for healthy childhood eating behaviors. Responses were recoded for never and rarely = 0 and sometimes, often, and always = 1 as a dichotomous categorical variable. The last question that determined maternal control over eating behavior was Question 15(a), "I make sure that my child does not eat too many sweets or junk foods." This question provided information on how mothers monitored and or controlled the amount of sweets and sugary foods that their child consumed on a daily basis. Responses were recoded as disagree, slightly disagree, and neither = 0 and slightly agree and agree = 1 as a dichotomous categorical variable.

Control Variables

In order to control for confounding factors that affected the outcomes of this study, several variables were selected based on the current literature. As the sample for this study was based on African American WIC participants, I included the variables pertaining to race and WIC participation for both mothers and children. In addition to this, maternal age, maternal marital status, maternal parity, maternal education, maternal

household income, and maternal employment status were also used as controls. The majority of the controls were taken from the IFPSII DEMOGRAPHIC QUESTIONNAIRE, however maternal age and parity were taken from the PRENATAL QUESTIONNAIRE under SECTION A: HEALTH AND HEALTHCARE and SECTION C: INFANT FEEDING respectively. WIC participation was taken from the IFPSII MONTH 3 and 6 SURVEYS: SECTION J: entitled OTHER INFORMATION.

Statistical Analysis

Statistical inferential analyses was conducted by way of SPSS Statistics 21, which was downloaded from the Walden University website. Because secondary data were used for this study, all missing data were recoded "M" for consistency in the secondary analysis. The primary data were cleaned by way of researchers consolidating variables with more than one field, cleaning outliers, cleaning inconsistent responses, assigning negative values to questions with multiple items, cleaning skip patterns, and imputing missing values. For this study, determining an association between exclusive breastfeeding and maternal control over child health behavior was the outcome of interest. First, Pearson's Chi Square Test of independence were performed and multicollinearity was assessed for potential correlations between predictor variables associated with maternal control over child health behavior outcomes. The predictor variables of maternal age, maternal marital status, maternal parity, maternal education, maternal household income, and maternal employment were considered for study based on the review of the literature. A probability value of 0.25 or less was deemed significant and thus eligible for further adjusted analysis. Chi square tests were performed to explore

the relationship between the independent and dependent variables for each research question. Due to both the independent and dependent variables being dichotomous, I planned to use logistic regression to assess the strength of the association between exclusive breastfeeding and maternal control over physical activity and eating behaviors as well as the significance of each predictor variable through 95% confidence intervals and odds ratios.

Table 2

Summary of Statistical Analyses

RQ1: Among African American WIC participants, is there an association between exclusive breastfeeding and maternal control over eating behavior in children within a 6-year period?

Hypothesis	Variables	Statistical Test
H_A1: Among African American WIC participants, there is a relationship between exclusive breastfeeding and maternal control over eating behavior in children within a six-year period	**Independent Variable:** Exclusive breastfeeding (measured at 3 and 6 months) **Dependent Variable:** Maternal control over eating behavior	Adjusted odds ratios using multivariable logistic regression controlling for demographic characteristics. (OR, 95% CI)

RQ2: Among African American WIC participants, is there an association between exclusive breastfeeding and maternal control over physical activity in children within a 6-year period?

Hypothesis	Variables	Statistical Test
H_A2: Among African American WIC participants, there is a relationship between exclusive breastfeeding and maternal control over eating physical activity in children within a six-year period.	**Independent Variable:** Exclusive breastfeeding (measured at 3 and 6 months) **Dependent Variable:** Maternal control over physical activity	Adjusted odds ratios using multivariable logistic regression controlling for demographic characteristics. (OR, 95% CI)

Threats to Validity

Internal validity helps researchers to determine if there is a cause and effect relationship between a set of variables, while external validity is based on the extent to which I can generalize my findings to the target population (Creswell, 2009, p. 162). In

regard to internal validity, participants began providing information from the third trimester of pregnancy until 1 year postpartum and approximately six years later. Because data was collected in monthly intervals, there was less potential for recall bias. However, there is questionable nature with self-reported data, as it is often influenced by social desirability. This could have been strengthened if medical records were used to cross-reference and or confirm the responses from respondents. On the other hand, the IFPSII and Y6FU studies used a prospective design that tested a variety of survey questions about feeding patterns within a large sample. The Y6FU is both valuable and unique in its approach as it provides insight on long-term health behaviors of children. The questionnaires used in the IFPSII and Y6FU were tested in a pilot study of 133 mothers of 6 year-old children. Also, survey questions were based on established national surveys and published scales so the results could be more readily compared to other studies.

The main limitation of the IFPS II and the Y6FU that impacted external validity was that the sample was not nationally representative. Because the secondary analysis only sampled African American mothers, it is somewhat difficult to apply or generalize the findings from this study to larger African American populations of women and children. If researchers oversampled African American mothers enrolled in the WIC program, the results for the secondary analysis could be strengthened. Nonetheless, the findings from this study have contributed to the paucity of knowledge surrounding breastfeeding practices and child health behaviors after 6 years, especially within low-income African American populations.

Ethical Considerations and Protection of Participant Rights

The proposal for this study was submitted to the IRB at Walden University. Primary data were obtained from the Center for Disease Control and Prevention's IFPS II and its Y6FU. I submitted a request through e-mail to ifps@cdc.gov in order to obtain the dataset. A brief description of the proposed study, research questions, and its potential influence on social change was included. The dataset was not accessed until after IRB approval, however codebook variables were examined to address the research questions of interest.

Data were stored on a password-protected MacBook Pro, in which I was the sole owner. The password to my laptop computer was changed every month to ensure security. Considering that the dataset is designated for public use, there were no agreements or standards that had to be agreed upon for the retrieval or storage of data. All data were backed up on an external Seagate hard drive, which was stored in a portable cashier lock box outside of use. Considering that I plan to prepare for publications, the dataset will be stored for a minimum of 5 years. After the findings of this study have been disseminated I will contact the CDC at ifps@cdc.gov and ask how to proceed with the data, whether it be deleting it altogether or sending the data files back to them.

All respondents for both the IFPSII and the Y6FU were assigned an identification number to avoid the use of names or other personal identifying information. Furthermore, all dates on the questionnaires were shifted by random intervals to assure that individuals could not be identified. Data were linked through identification numbers to ensure that

data collected from respondents for the IFPSII study were matched to the data collected from respondents for the Y6FU.

Summary

The findings from this study may be useful for improving the public health infrastructure surrounding breastfeeding. Policy makers, public health educators, medical professionals, and breastfeeding promotion programs, such as WIC, may be enhanced through a more comprehensive understanding of the association between breastfeeding practices and child health outcomes. The findings from this study will be disseminated to several maternal and child health and women's health journals, as well as national conferences, such as the Global Maternal Newborn Conference, the American Public Health Association, and the Academy of Breastfeeding Medicine International Meeting.

In Chapter 3, details surrounding the research design and methodology were discussed in addition to the research questions, variables for study, and hypotheses for determining the presence of an association between exclusive breastfeeding and maternal control over child health behaviors. Pearson's Chi Square and logistic regression were the proposed statistical tests for analysis in this longitudinal study. The next chapter will include the results of the study as well as explanations on the testing of hypotheses. Chapter 5 will primarily consist of the interpretation of the findings, implications for social change, and several recommendations for future areas of study.

Chapter 4: Results

Introduction

The purpose of this quantitative study was to assess the possibility of an association between exclusive breastfeeding and maternal control over eating behavior and physical activity among WIC participants after 6 years. The RQs and hypotheses I developed to guide this study were as follows:

RQ1: Among African American WIC participants, is there an association between exclusive breastfeeding and maternal control over eating behavior in children within a 6-year period?

$H_0$1: Among African American WIC participants, there is no relationship between exclusive breastfeeding and maternal control over eating behavior in children within a 6-year period

H_A1: Among African American WIC participants, there is a relationship between exclusive breastfeeding and maternal control over eating behavior in children within a 6-year period

RQ2: Among African American WIC participants, is there an association between exclusive breastfeeding and maternal control over physical activity in children within a 6-year period?

$H_0$2: Among African American WIC participants, there is no relationship between exclusive breastfeeding and maternal control over physical activity in children within a 6-year period.

H_A2: Among African American WIC participants, there is a relationship between exclusive breastfeeding and maternal control over eating physical activity in children within a 6-year period.

This chapter will begin with an overview of the data collection and the statistical analyses, a summary of the baseline descriptives and demographic characteristics, followed by a series of tables and figures, and a synopsis of the findings pertaining to the research questions and hypotheses for this study.

Data Collection

I used secondary data from the IFPS II and its Y6FU to gain insight on how breastfeeding practices may be used as a precursor to child health outcomes after a period of years. The sample for this study was based on a consumer opinion panel in which 500,000 households throughout the United States were surveyed. Healthy women who were at least 18 years of age and gave birth at full or nearly term to a single infant were included in the study. All participants received the initial questionnaire in the mail during their third trimester. This was followed by a telephone interview around the time of the mother's expected date of delivery in order to verify the birth of the baby. Mothers received questionnaires each month for a total of 1 year and had a response rate between 63% and 83%. Six years later 2,958 mothers qualified for the Y6FU, which was determined by the completion of the IFPS II's initial questionnaire and phone interview. The questionnaires from the Y6FU were matched to the infant data from IFPSII by participation number and verified through infant birth dates and maternal feeding

characteristics. As a result, the sample size for the Y6FU was 1,542 with a 52.1% response rate.

In order to obtain the primary dataset, I sent an e-mail to the Centers for Disease Control and Prevention discussing my proposed research questions. The contact person provided me with the SAS raw data files, codebooks, and a user's manual for reference. On May 26th, 2016, the Walden University IRB confirmed that this study met all of the university's ethical standards (IRB approval number 05-26-16-0293178). I did not access data until after obtaining IRB approval. Once the dataset was retrieved all files were backed up on an external Seagate hard drive, which was stored in a portable cashier lock box outside of use.

Data were cleaned by way of researchers consolidating variables with more than one field, cleaning outliers, cleaning inconsistent responses, assigning negative values to questions with multiple items, cleaning skip patterns, and imputing missing values. All respondents for both the IFPSII and the Y6FU were assigned an identification number to avoid the use of personal identifying information. Furthermore, all dates on the questionnaires were shifted by random intervals to assure that individuals could not be identified. Data were linked through identification numbers to ensure that data collected from respondents for the IFPSII study were matched to the data collected from respondents for the Y6FU.

Data Analysis

Descriptive Statistics

Due to this study focusing solely on African American WIC participants, I used demographic data from the IFPS II to calculate the sample population. Table 3 depicts maternal race, which indicates the number of African American respondents compared to other races. Table 4 represents maternal WIC participation according to race, and therefore, the number of African American respondents who were enrolled in the WIC program prior to delivery. Based on this data, there were a total of 173 African American WIC participants included in this study.

Table 3

Maternal Race (from initial IFPS II survey)

Maternal Race	
	n (%)
African American	308 (6.3%)
White	3,980 (81.2%)
Asian Pacific Islander	141 (2.9%)
Other	317 (6.4%)
Total Valid Cases	4,746 (96.8%)
Missing	156 (3.2%)

Table 4

Maternal WIC Participation According to Race (from initial IFPS II survey)

	Maternal WIC Participation				
	Race				
	Black	White	A.P. Islander	Other	Total
	n (%)				
WIC	173 (56.2%)	1221 (30.7%)	27 (19.1%)	153 (48.6%)	1574 (33.2%)
No WIC	135 (43.8%)	2753 (69.3%)	114 (80.9%)	162 (51.4%)	3164 (66.8%)

Prior to analysis, I screened the data using diagnostic techniques described by Mertler and Vannatta (2005). Frequencies and descriptives were obtained for all variables to identify missing data. Considering that the purpose of this study was to determine the possibility of an association between exclusive breastfeeding and child health behaviors, the baseline descriptives and demographic characteristics included maternal age, maternal marital status, maternal parity, maternal education, maternal household income, and maternal employment status. Although socioeconomic status is often measured by education, income, and employment status (Centers for Disease Control and Prevention, 2014), I used maternal age, parity, and marital status to compensate for varying lengths of maternity leave and to gain a better understanding of how breastfeeding support in the home may impact the concept of maternal control.

In regard to maternal age, shown in Table 5, 103 participants were between the ages of 18 and 24 and 41 mothers were between 25 and 29. With 16 women being between 30 and 34 and 12 participants being 35 years of age and older, most mothers were within an ideal reproductive age as fertility gradually declines during a woman's

30s and steadily decreases after age 35 (American Society for Reproductive Medicine, 2012). Mean maternal age reported was $M = 24.5$ with $SD = 5.93$.

Table 5

Maternal Age ($n = 173$ from initial IFPS II survey)

Maternal Age	
	n (%)
18–24	103 (59.5%)
25–29	41 (23.7%)
30–34	16 (9.2%)
35+	12 (7%)
Total Valid Cases	172 (99.4%)
Missing	1 (0.6%)

Maternal parity was based on the number of children mothers had that were not included in the IFPS II study. Table 6 depicts that there were 62 mothers who reported having had no other children, 58 claimed to have one child, and 38 mothers had two or more children. Mean maternal parity reported was $M = 1.16$ with $SD = 1.57$.

Table 6

Maternal Parity ($n = 173$ from initial IFPS II survey)

Maternal Parity	
	n (%)
0 kids	62 (35.8%)
1 child	58 (33.5%)
More than 1 child	38 (22%)
Total Valid Cases	158 (91.3%)
Missing	15 (8.7%)

For maternal marital status, which is shown in Table 7, there were a total of 41 mothers who were married at the time of the survey. One respondent was divorced, six were separated, zero were widows, and 88 were never married.

Table 7

Maternal Marital Status (*n* = 173 from initial IFPS II survey)

Maternal Marital Status	
	n (%)
Married	41 (23.7%)
Widowed	0 (0%)
Divorced	1 (0.5%)
Separated	6 (3.5%)
Never Married	88 (50.9%)
Total Valid Cases	136 (78.6%)
Missing	37 (21.4%)

In regard to maternal education level in Table 8, the majority of respondents completed 1–3 years of college, yet 12 were college graduates, and two had some form of postgraduate education. On the other hand, 35 were high school graduates, nine completed 1–3 years of high school, zero completed 8 years of grade school, and one completed 1–7 years of grade school.

Table 8

Maternal Education Level (n=173 from initial IFPS II survey)

Maternal Education Level	
	n (%)
1-7 years grade school	1 (0.6%)
8 years grade school	0 (0%)
1-3 years high school	9 (5.2%)
high school graduate	35 (20.2%)
1-3 years college	79 (45.7%)
college graduate	12 (6.9%)
post graduate	2 (1.2%)
Total Valid Cases	138 (79.8%)
Missing	35 (20.2%)

Maternal employment status measured full and part time employment outside of the home among mothers in Table 9. Mothers who stayed at home were considered to be full-time homemakers and were included in this study for comparative analysis. There were 35 mothers who worked full time, 16 who considered themselves to be a full time homemaker, 14 who worked part time for someone else, 26 were unemployed, six were self-employed, zero were retired and not employed, and 26 were not employed due to being either disabled or a student.

Table 9

Maternal Employment Status (*n* = 173 from initial IFPS II survey)

Maternal Employment Status	
	n (%)
Works for someone else full time	35 (20.2%)
Temporarily unemployed	26 (15%)
Self Employed	6 (3.5%)
Works for someone else part time only	14 (8.1%)
Retired and not employed	0 (0%)
Disabled, student, etc. and not employed	26 (15%)
Full time homemaker	16 (9.2%)
Total Valid Cases	123 (71%)
Missing	50 (29%)

Table 10 outlines maternal household income, or the total yearly income of all members of the household before taxes. There were 55 women whose household income was 35,000 or less; 51 had a household income between 36,000 and 40,000; 34 were between 41,000 and 45,000; 29 had income between 46,000 and 50,000; four were between 51,000 and 55,000; and zero had a household income that was 56,000 or greater. Mean maternal household income reported $M = 43.6$ with $SD = 5.65$.

Table 10

Maternal Household Income (n=173 from initial IFPS II survey)

Maternal Household Income	
	n (%)
≤35K	55 (31.8%)
36-40K	51 (29.5%)
41-45K	34 (19.7%)
46-50K	29 (16.7%)
51-55K	4 (2.3%)
56K+	0 (0%)
Total Valid Cases	173 (100%)
Missing	0 (0%)

One of the major limitations of this secondary analysis was the extremely small percentage of African American respondents. Because the sample from the primary dataset was not nationally representative of the general population, it was somewhat difficult to apply or generalize the findings from this study to other African American populations of women and children. The majority of the respondents were more likely to be White, older in age, married, and less likely to have a low socioeconomic background. If researchers oversampled African American mothers enrolled in the WIC program, the results for the secondary analysis could be strengthened. Nonetheless, the findings from this study have contributed to the paucity of knowledge surrounding breastfeeding practices and child health behaviors after 6 years, especially within low-income African American populations.

Results

A series of crosstabulations were performed in order to determine the possibility of an association between exclusive breastfeeding and maternal control over eating behaviors and physical activity among African American WIC participants within a 6-year period. This analysis was appropriate both theoretically and conceptually. The initial set of cross-tabulations were used to assess the independent variable of study or the number of WIC participants who exclusively breastfed at 3 months and continued on for 6 months. Based on Table 11, there were 43.8% of Black WIC participants who exclusively breastfed at 3 months and there were no Black WIC participants who exclusively breastfed at 6 months, which is shown in Table 12.

Table 11

Percentage of WIC Mothers Who Exclusively Breastfed at 3 Months According to Race

Mother enrolled in WIC while exclusively breastfeeding at 3 months					
	Race				
	White	Black	A.P. Islander	Other	Total
	n (%)				
Exc. BF	153 (19.9%)	7 (43.8%)	5 (20.8%)	9 (29%)	174 (20.7%)
No Exc. BF	404 (32.1%)	44 (54.3%)	5 (12.5%)	49 (55.1%)	502 (34.2%)

Table 12

Percentage of WIC Mothers Who Exclusively Breastfed at 6 Months According to Race

Mother enrolled in WIC while exclusively breastfeeding at 6 months					
	Race				
	White	Black	A.P. Islander	Other	Total
	n (%)				
Exc. BF	20 (22.5%)	0 (0%)	0 (0%)	0 (0%)	20 (22.2%)
No Exc. BF	366 (21.5%)	29 (43.3%)	9 (15.5%)	48 (43.2%)	452 (23.3%)

Because there were no African American WIC participants who exclusively breastfed at 6 months, the statistical analysis was based solely on the percentage of African American WIC participants who exclusively breastfed at 3 months. The following crosstabulation examined race, WIC participation and exclusive breastfeeding at 3 months, and the number of days per week mothers participated in physical activity with their child at 6 years of age. Based on Table 13, there was only one WIC participant who reported engaging in physical activity with their child three days a week while one other WIC participant reported engaging in physical activity with their child seven days a week. There was no statistically significant association between African American WIC participants who exclusively breastfed at three months and the number of days per week mothers participated in physical activity with their child at six years of age as $X^2 (3) = 2.92, p > .05$.

For this cross-tabulation, the levels of maternal control were categorized according to the number of days WIC participants engaged in physical activity with their child. For example, mothers who participated in physical activity 0–2 days had low levels of maternal control, mothers who exercised with their child 3–4 days a week had moderate levels of maternal control, and those with high levels of maternal control were involved in physical activity 5–7 days per week.

Table 13

Number of Days African American WIC Participants Engaged in Physical Activity With Their Child Per Week While Exclusively Breastfeeding at 3 Months

Days African American WIC Participants Engaged in Physical Activity With Their Child Per Week While Exclusively Breastfeeding at Three Months		
	n	%
Days		
0	0	0
1	0	0
2	0	0
3	1	50
4	0	0
5	0	0
6	0	0
7	1	50
Total	2	100%

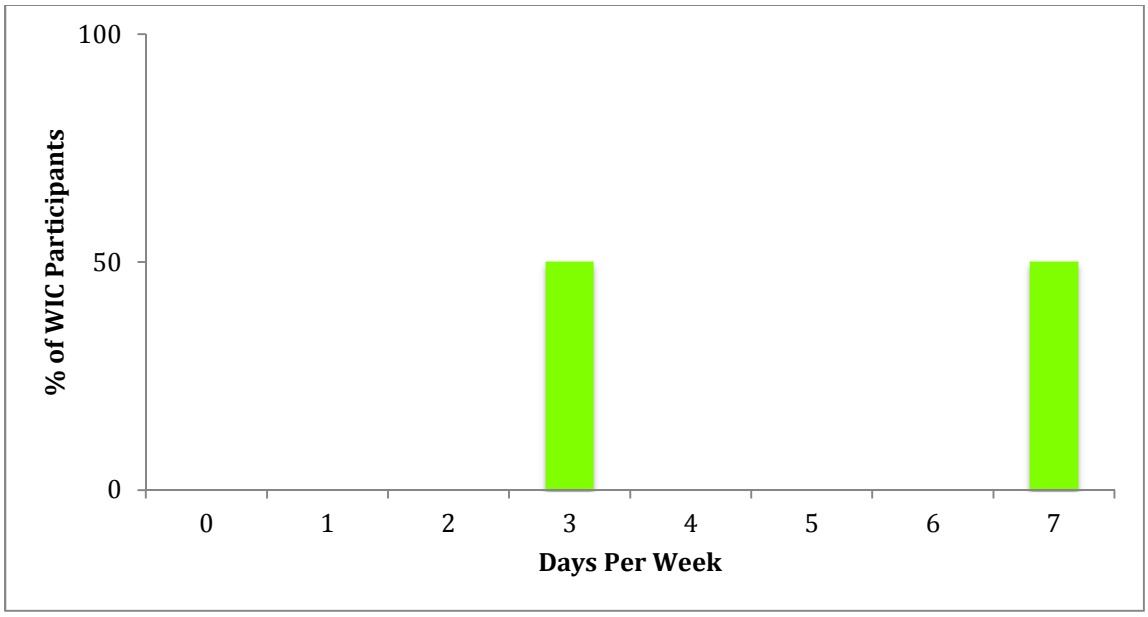

Figure 3. Days WIC participants engaged in physical activity with their child while exclusively breastfeeding at 3 months

The second set of crosstabs examined race, WIC participation and exclusive breastfeeding at 3 months of age, and the number of days children were active for at least 60 minutes per week. Based on Table 14, there was only one WIC participant who reported that their child was active for at least 60 minutes 3 days a week, while one other WIC participant reported that their child was active for at least 60 minutes 6 days a week. There was no statistically significant association between African American WIC participants who exclusively breastfed at 3 months and the number of days mothers reported that their child was active for at least 60 minutes per week at 6 years of age as X^2 (2) = 2.92, p > .05.

For this crosstabulation, the levels of maternal control were categorized according to the number of days WIC participants' children were active for at least 60 minutes. For example, mothers with children who were active for 60 minutes 0–2 days per week had low levels of maternal control, mothers with children who were active 60 minutes 3–4 days a week had moderate levels of maternal control, and those with high levels of maternal control had children who were active for 60 minutes 5–7 days per week.

Table 14

Number of Days African American WIC Participants' Children Were Active For At Least 60 mins Per Week While Exclusively Breastfeeding at 3 Months

Days African American WIC Participants' Children Were Active For At Least 60 mins *Per Week While Exclusively Breastfeeding at 3 Months*		
	n	%
Days		
0	0	0
1	0	0
2	0	0
3	1	50
4	0	0
5	0	0
6	1	50
7	0	0
Total	2	100%

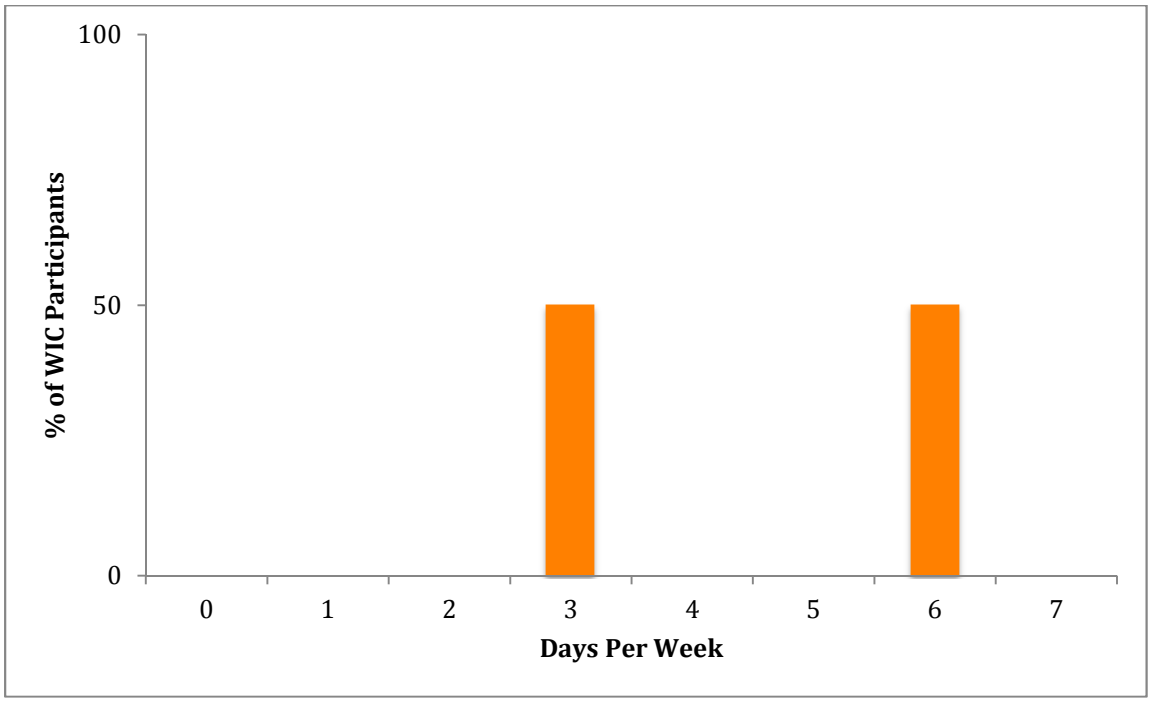

Figure 4. Days WIC participants' children were active for at least 60 mins while exclusively breastfeeding at 3 months

The next set of crosstabs performed to assess eating behaviors included race, WIC participation and exclusive breastfeeding at 3 months of age, and the number of days children ate dinner at home with an adult per week at 6 years of age. Based on Table 15, there were two WIC participants who reported that their child ate dinner at home with an adult 7 days a week. There was no statistically significant association between African American WIC participants who exclusively breastfed at 3 months and the number of days per week mothers reported that their child ate dinner at home with an adult at 6 years of age as X^2 (1) = 0.83, p > .05.

For this crosstabulation, the levels of maternal control were categorized according to the number of days WIC participants ate dinner at home with their child. For example, mothers who ate dinner with their child 0–2 days had low levels of maternal control, mothers who had dinner at home with their child 3–4 days a week had moderate levels of maternal control, and those with high levels of maternal control ate dinner with their child 5–7 days per week.

Table 15

Number of Days African American WIC Participants' Children Ate Dinner at Home With an Adult Per Week While Exclusively Breastfeeding at 3 Months

Days African American WIC Participants' Children Ate Dinner At Home With An Adult Per Week While Exclusively Breastfeeding at 3 Months		
	n	%
Days		
0	0	0
1	0	0
2	0	0
3	0	0
4	0	0
5	0	0
6	0	0
7	2	100
Total	2	100%

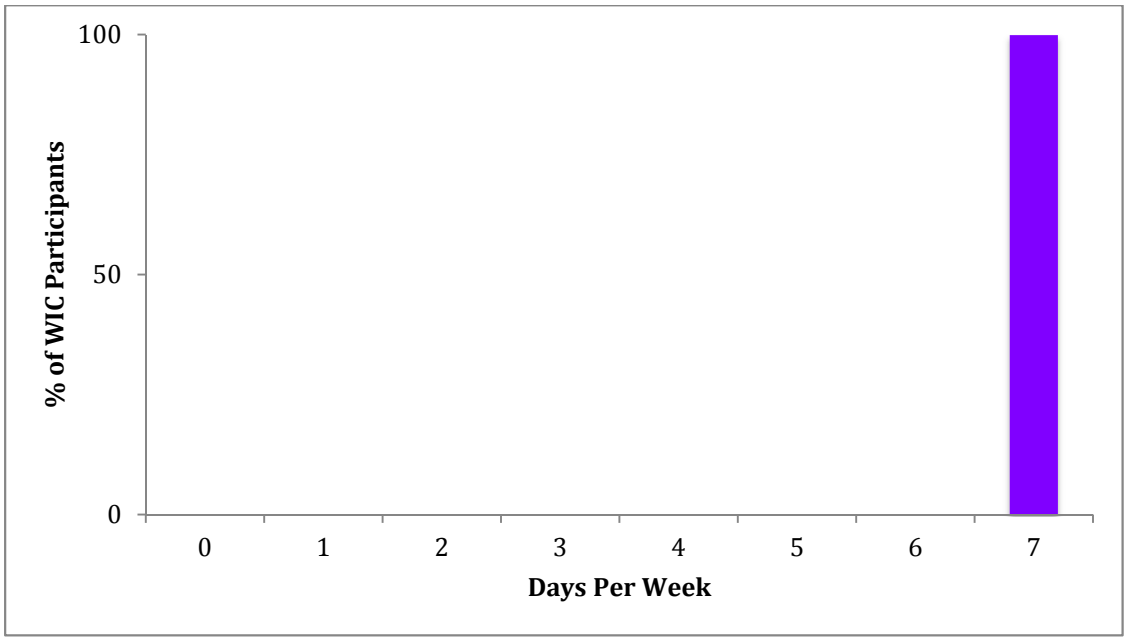

Figure 5. Days WIC participants' children ate dinner at home with an adult while exclusively breastfeeding at 3 months

The next set of crosstabs performed to assess eating behaviors included race, WIC participation and exclusive breastfeeding at 3 months of age, and the number of days children ate fast food for dinner per week. Based on Table 16, there was one WIC participant who reported that their child did not eat fast food for dinner, while another WIC participant reported that their child ate fast food for dinner twice a week. There was no statistically significant association between African American WIC participants who exclusively breastfed at three months and the number of days mothers reported that their child ate fast food for dinner per week at six years of age as X^2 (2) = 2.22, p > .05.

For this cross-tabulation, the levels of maternal control were categorized according to the number of days WIC participants' children ate fast food for dinner per week. For example, mothers with children who ate fast food for dinner 0–2 days had high levels of maternal control, mothers who allowed their children to eat fast food 3–4 days a week had moderate levels of maternal control, and those with low levels of maternal control had children who ate fast food for dinner 5–7 days per week.

Table 16

Number of Days African American WIC Participants' Children Ate Fast Food For Dinner Per Week While Exclusively Breastfeeding at 3 Months

Days African American WIC Participants' Children Ate Fast Food For Dinner Per Week While Exclusively Breastfeeding at 3 Months		
	n	%
Days		
0	1	50
1	0	0
2	1	50
3	0	0
4	0	0
5	0	0
6	0	0
7	0	0
Total	2	100%

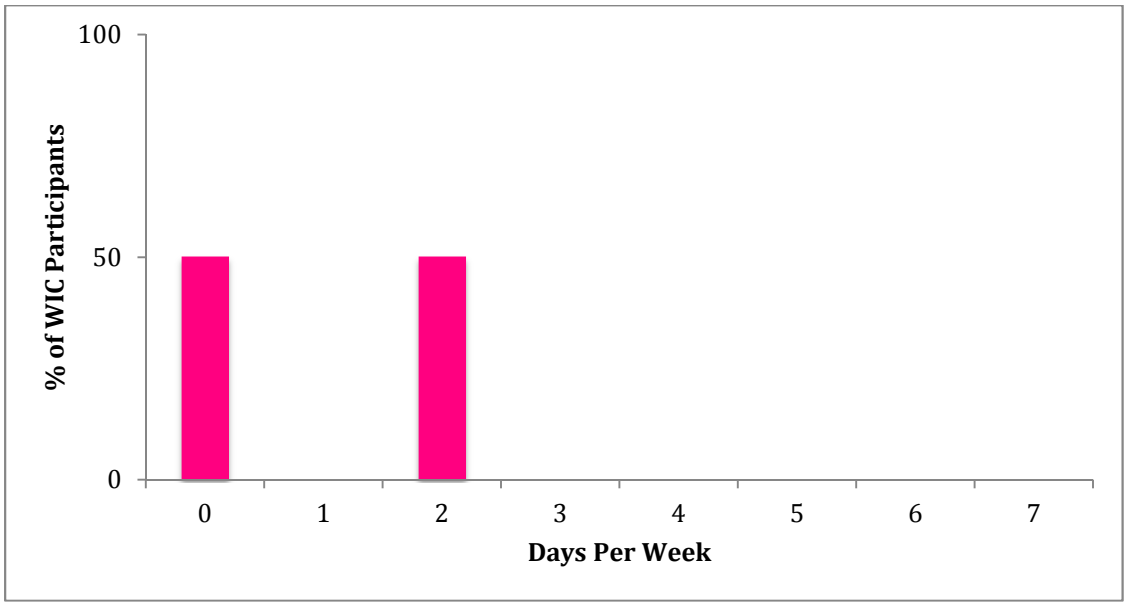

Figure 6. Days African American WIC participants' children ate fast food for dinner while exclusively breastfeeding at 3 months

The next set of crosstabs performed to assess eating behaviors included race, WIC participation, exclusive breastfeeding at 3 months of age, and fruit and vegetable snack availability in the home. Based on Table 17, there were two WIC participants who reported that they always had fruits and vegetables available in their home. However, there was no statistically significant association between African American WIC participants who exclusively breastfed at three months and mothers' reports of fruit and vegetable snack availability in the home at 6 years of age as X^2 (1) = 2.22, p > .05

For this cross-tabulation, the levels of maternal control were categorized according to how WIC participants agreed with having fruits and vegetables readily available as snacks in the home for their children. For example, mothers who "always" agreed with having fruits and vegetables available in their home had high levels of maternal control, mothers who "sometimes" or "often" had fruits and vegetables in their home had moderate levels of maternal control, and those with low levels of maternal control "rarely" had fruits and vegetables available in the home.

Table 17

African American WIC Participants' Agreement With Fruit and Vegetable Snack Availability In the Home While Exclusively Breastfeeding at 3 Months

African American WIC Participants' Agreement With Fruit and Vegetable Snack Availability In The Home While Exclusively Breastfeeding at 3 Months		
	n	%
Rarely	0	0
Sometimes	0	0
Often	0	0
Always	2	100
Total	2	100%

The last set of cross-tabulations performed to assess eating behaviors included race, WIC participation, exclusive breastfeeding at 3 months of age, and how well WIC participants monitored their child's junk food consumption. Based on Table 18, there was one WIC participant who slightly agreed and one WIC participant who agreed that they monitored their child's junk food consumption. There was no statistically significant association between African American WIC participants who exclusively breastfed at three months and mothers' monitoring their child's junk food consumption at 6 year of age as X^2 (2) = 0.83, p > .05.

For this cross-tabulation, the levels of maternal control were categorized according to how WIC participants agreed with monitoring their child's junk food consumption. For example, mothers who "agreed" with monitoring junk food had high levels of maternal control, mothers who "slightly agreed" or "neither" agreed or disagreed with monitoring their child's junk food intake had moderate levels of maternal control, and those with low levels of maternal control "disagreed" or "slightly disagreed" with monitoring how much food their child consumed.

Table 18

African American WIC Participants' Agreement With Monitoring Child Junk Food Consumption While Exclusively Breastfeeding at 3 Months

African American WIC Participants' Agreement With Monitoring Child Junk Food Consumption While Exclusively Breastfeeding at 3 Months		
	n	%
Disagree	0	0
Slightly Disagree	0	0
Neither	0	0
Slightly Agree	1	50
Agree	1	50
Total	2	100%

Summary

The purpose of this quantitative study was to assess the possibility of an association between exclusive breastfeeding and maternal control over eating behavior and physical activity among WIC participants after 6 years. Based on the cross-tabulations that were initially performed to address each RQ, no levels of significance were obtained. Therefore, there was no sound justification to run a regression analysis to determine association between the independent and dependent variables. For RQ1: Among African American WIC participants, is there an association between exclusive breastfeeding and maternal control over eating behavior in children within a 6-year period? The alternative hypothesis was rejected and the null hypothesis was accepted, as there was no relationship between exclusive breastfeeding and maternal control over eating behavior in children within a 6-year period among African American WIC participants.

For RQ2: Among African American WIC participants, is there an association between exclusive breastfeeding and maternal control over physical activity in children within a six-year period? The alternative hypothesis was rejected and the null hypothesis was accepted, as there was no relationship between exclusive breastfeeding and maternal control over physical activity in children within a 6-year period among African American WIC participants.

This chapter began with an overview of data collection as well as statistical analyses in which a series of tables and figures were used to depict the findings from the study. In Chapter 5, I will discuss the interpretations of the findings in detail in addition to the limitations of the study, implications for social change, and recommendations for future studies.

Chapter 5: Summary, Conclusions, and Recommendations

Overview

Breastfeeding is the ideal source of nourishment for newborns and infants as it provides all of the nutrients for healthy growth and development. Children who are exclusively breastfed for a minimum of 6 months have the most favorable health outcomes in regard to infant mortality and the prevention of childhood disease (World Health Organization, 2016). Considering that breast milk is produced naturally by a child's birth mother, it is readily available, and therefore, cost-effective for women despite race or socio-economic status. According to the Center for Disease Control's (2016) Breastfeeding Report Card, 4 out of 5 mothers initiate breastfeeding, but only half continue for 3 months, and nearly one-third carry on to 6 months. Due to higher breastfeeding initiation rates being coupled with low continuation rates, there is a need for more breastfeeding support initiatives that place emphasis on access to quality education-based healthcare, health policies, and funding to ensure that mothers obtain social and physical support at home and in the workplace.

The benefits of breastfeeding for both mothers and children are not only extensive, but they also contribute to lifelong health and wellness. Specifically, children who are breastfed are less likely to be overweight and perform better academically (World Health Organization, 2013). With over 23 million U.S. children and adolescents being classified as overweight or obese (Leadership for Healthy Communities, 2014), the purpose of this study was to identify a potential link between a mother's preference to exclusively breastfeed her infant and its influence on long-term child health behaviors.

Although breastfeeding is a learned health behavior within itself, I used the social cognitive theory as a guide to explore and understand the association between exclusive breastfeeding and maternal control over childhood nutrition and physical activity among African American women enrolled in the Women Infants and Children Nutritional Supplementation Program. The psychosocial tenets that reinforced the primary concept of Bandura's (1986) social cognitive theory are reciprocal determinism, behavioral capability, observational learning, outcome expectations, incentive motivators, and self-efficacy. Based on the main premise of reciprocal determinism of the social cognitive theory in which environmental, behavioral, and personal factors are interchangeably projected through human agency (Bandura, 1986, 1989), exclusive breastfeeding behaviors directly correlate to the social context that undermines the concept of maternal and child health. A mother's decision to breastfeed her infant is not only a personal behavior, but a unique practice that fortifies a healthy environment for a child. I designed this study to explore the long-term impact of exclusive breastfeeding through maternal control or how well a mother monitors her child's eating behaviors and physical activity levels at 6 years of age.

Furthermore, I used the other constructs of the social cognitive theory to highlight the relationship between a mother and child in addition to the ways in which children learn to model behaviors. As a result, it could be hypothesized that mothers who settled on the pivotal verdict to breastfeed their infants would also continue to make choices that were conducive to their child's wellbeing. This is based on the assumptions that children

rely on their caregivers to prepare their meals and teach them the importance of regular physical activity.

As the sample population for this study was African American WIC participants, the findings may serve as a motive for the investment in more breastfeeding promotion initiatives to increase the number of children who benefit from breast milk. In this quantitative study, I conducted a secondary analysis of the IFPS II and its Y6FU. Primary data were collected by the Centers for Disease Control and Prevention and the Food and Drug Administration by way of monthly questionnaires that were mailed to mothers beginning their third trimester of pregnancy until 1 year postpartum for the IFPS II. The follow-up study was administered when children from the IFPS II were 6 years of age.

I designed the RQs to address the potential association between exclusive breastfeeding and maternal control over child health behaviors. RQ1 was: Among African American WIC participants, is there an association between exclusive breastfeeding and maternal control over eating behavior in children within a 6-year period? I rejected the alternative hypothesis for this RQ and accepted the null hypothesis as I found no relationship between exclusive breastfeeding and maternal control over eating behavior in children within a 6-year period among African American WIC participants. RQ2 was: Among African American WIC participants, is there an association between exclusive breastfeeding and maternal control over physical activity in children within a 6-year period? I also rejected the alternative hypothesis for this RQ and accepted the null hypothesis as I found no relationship between exclusive

breastfeeding and maternal control over physical activity in children within a 6-year period among African American WIC participants.

The data revealed that 43.8% of African American WIC participants exclusively breastfed for 3 months, but there were no mothers who reported exclusively breastfeeding for 6 months. Because there were no African American WIC participants who exclusively breastfed at 6 months, my statistical analysis was based entirely on the percentage of African American WIC participants who exclusively breastfed at 3 months. I performed cross-tabulations to examine race, WIC participation, exclusive breastfeeding at 3 months, and child health behaviors at 6 years of age. In regard to physical activity, 50% of WIC participants who exclusively breastfed for 3 months reported engaging in physical activity with their child 3 days a week, while the other 50% reported engaging in physical activity with their child 7 days a week. Similarly, 50% of mothers, who exclusively breastfed for 3 months, stated that their child was active for at least 60 minutes 3 days a week and 50% reported that their child was active for 60 minutes 6 days a week.

After assessing the eating behaviors of children at 6 years of age, I determined that 100% of African American WIC participants, who exclusively breastfed for 3 months, ate dinner at home with their child 7 days a week. Conversely, there were 50% of WIC mothers, who exclusively breastfed for 3 months and prohibited their child from eating fast food any days of the week, while 50% stated that their child ate fast food twice a week. In regard to fruit and vegetable availability in the home, 100% of African American WIC participants who breastfed for 3 months, reported that they always had

such foods available. Lastly, 50% of WIC mothers either slightly agreed or agreed that they monitored their child's junk food consumption. Based on the cross-tabulations that I initially conducted to address each RQ, no levels of significance were obtained. Therefore, there was no sound justification to run a regression analysis in determining an association between the independent and dependent variables.

Within the context of current literature, the results of this study contribute to the body of knowledge surrounding breastfeeding practices and maternal and child health behaviors among African American WIC participants. This final chapter will include an interpretation of the findings, discussion of the strengths and limitations of study, implications for social change, recommendations for future research, and my conclusions.

Interpretations of the Findings

As there were no way to determine an association between exclusive breastfeeding and maternal control over eating behavior and physical activity in children within a 6-year period, I drew conclusions from the cross-tabulations that were performed during statistical analysis. The data indicated that there were 43.8% of African American WIC participants who exclusively breastfed for 3 months, but there were no mothers who continued on to breastfeed for 6 months. According to the Centers for Disease Control and Prevention's Breastfeeding Report Card (2016), only 28.9% of African American mothers exclusively breastfeed their infants through 3 months and 14.6% continue on to 6 months. This suggests that the WIC program may have been successful in encouraging breastfeeding initiation strategies for women to exclusively breastfeed for 3 months as the percentage was almost 15% higher than the national average. As the Healthy People

(2017) goal for 2020 is for 81.9% of women to initiate breastfeeding with 46.2% and 25.5% exclusively breastfeeding at 3 and 6 months respectively, WIC participants are in dire need of breastfeeding continuation initiatives that support mothers in meeting the 6 month recommendation for exclusive breastfeeding.

Overall, African American mothers who were enrolled in the WIC program had moderate to high levels of maternal control. On average, WIC mothers engaged in physical activity with their child 3 days a week, but those that exclusively breastfed for 3 months participated in physical activity with their child 5 days a week at 6 years of age. These results support the findings of Holm et al. (2012), in which children were found to be more motivated to be physically active when their parents were involved. More importantly, another study indicated that adolescents who received support from their parents were found to be 60% more likely to be physically active than those who received little to no support (Mendonca & Cazuza de Farias Junior, 2015). According to the results of this study of African American WIC participants and those of other researchers, it can be predicted that children who participate in activities with their parents have a greater likelihood of adopting those behaviors long-term.

Conversely, WIC mothers admitted to ensuring that their child was physically active for an hour 7 days a week, while mothers who exclusively breastfed claimed that they encouraged 60 minutes of activity 4 to 5 days a week. The reason that breastfeeding mothers may have reported a slightly lower number of days than the consensus of WIC participants may be due to their focus on participating in quality activities with their child, having limited time for exercise, and prioritizing other family obligations. Another

possibility for breastfeeding mothers having lower reported days of an hour of physical activity may stem from the infrastructure of low-income neighborhoods in which many WIC participants live. Some mothers admitted that television was a safer option for their child because they could watch them more closely rather than having them play outside unattended (Mama et al., 2014).

In regard to average eating behaviors, I found the majority of WIC mothers, as well as those who exclusively breastfed their infants for 3 months, to not only eat dinner at home with their child 7 days a week, but also admitted to eating fast food only once a week. Furthermore, WIC mothers claimed that they always had fruits and vegetables available in their home while making an attempt to monitor their child's junk food consumption. Based on these results, it is evident that African American mothers enrolled in the WIC program had strong levels of maternal control over their child's eating behaviors.

Alternatively, some African American pregnant women enrolled in the WIC program admitted that they ate fast food on a daily basis (Groth & Morrison-Beedy, 2013). The findings from this study confirmed that fast food and junk food consumption was not only monitored, but limited to once a week. With such low fast food intake among WIC participants, it is possible that it was used as a reward or to manage child behavior (Fisher et al., 2015; Jones et al., 2014). Unlike Dixon et al.'s (2012) concluding statements of Black children consuming more sugar sweetened beverages and fast food meals than White children, the data from this study suggests that WIC may be useful in

counteracting some of the social determinants of childhood obesity as respondents were heavily involved in monitoring their children's eating behaviors.

In this study, the concept of maternal control was initiated through the act of exclusive breastfeeding, but the extent of control was showcased through childhood eating behaviors and physical activity in children at 6 years of age. Therefore, the decision and or controlling factor associated with breastfeeding directly correlates to how mothers feed and physically interact with their children long-term. Yielding the complexity of such, it was more than appropriate for me to utilize Bandura's social cognitive theory in order to gain a more thorough understanding of the data. According to the social cognitive theory, all beings are the nucleus of an adaptive learning equilibrium in which there is a continuous exchange between self-regulating individuals and their environments by way of reciprocal determinism (Bandura, 1986). This governing principle of the social cognitive theory supports the notion that both mothers and their children are in constant flux. Because child behavior is a mere representation of a mother's control, the ongoing exchange between a mother and child can also be referred to as a feedback loop of collective action (Bandura, 1986). Overall, the social cognitive theory highlights the importance of parental decision-making and its impact on children, who are often subjected to circumstances beyond their control.

As WIC mothers had strong levels of maternal control over their child's physical activity and eating behaviors, there is reason to believe that Moore and Bailey's (2013) claims of involving at least one parent in an intervention warrants successful health outcomes in children. Moreover, researchers have also concluded that the most effective

interventions for childhood obesity have concentrated on the entire family while integrating nutrition, behavioral factors, and physical activity (Jones et al., 2014; Kelishadi & Azizi-Soleiman, 2014; Moore & Bailey, 2013; Wilkerson et al., 2015). These studies along with the findings from this secondary analysis parallel several of the components of the social cognitive theory. For example, a child is naturally inclined to model the behaviors of his or her parent when there is an emotional connection or some form of positive reinforcement (Bandura, 1986). As children are the most receptive to parental guidance during their formative years, they are more likely to enhance their self-efficacy and behavior capability intuitively (Bandura, 1986). Additionally, children may be more confident in their ability to live a healthy lifestyle when they are provided with first-hand examples that are stimulated through unwavering parental support or incentive motivation via the distribution of rewards and punishments.

Although children are impressionable creatures that thrive off observational learning, they rely on the guidance from their parents in unfamiliar situations (Bandura, 1986). According to researchers, child fruit and vegetable consumption increased when mothers modeled behaviors and created a supportive environment (Knowlden et al., 2015; Pedersen et al., 2015). More importantly, African American parents who used an authoritative approach were less likely to have overweight children (Frankel et al., 2014; Thompson et al., 2013). Because WIC mothers, who exclusively breastfed, ate dinner at home with their child 7 days a week and always ensured that there were fruits and vegetables in the home, it is somewhat evident that the findings from this study coincide with both the current literature and the social cognitive theory.

Providing the significance of using breastfeeding as a mechanism to explore the impact of parental influence on child behaviors, the results from this study were inconclusive in determining a true association between exclusive breastfeeding and maternal control over child eating behaviors and physical activity levels. Consequently, it is difficult to further elaborate upon the findings within the context of the social cognitive theory without exceeding the data. Nonetheless, there is merit in the findings and the extent to which it has created a platform for researchers to further explore the concept of maternal control through breastfeeding.

Limitations of the Study

The collective purpose of the Infant Feeding Practices Study II (IFPS II) and its Year Six Follow-Up (Y6FU) was to identify the immediate and long-term health and developmental outcomes of infant feeding, food behavior, and maternal experience. Although the IFPS II and the Y6FU were national studies, the main limitation of the IFPS II and the Y6FU was that the sample was not nationally representative. The majority of the respondents were more likely to be White, older in age, married, and less likely to have a low socioeconomic background. As a result, there was an extremely small number of African American respondents who were enrolled in the WIC program and chose to exclusively breastfeed their infants, which makes it difficult to apply or generalize the findings from this study to other African American populations of women and children.

Considering that this study was a secondary analysis and data was limited to the degree in which it was provided, it is more than appropriate for researchers to consider replicating this study by oversampling African American mothers who were enrolled in

the WIC program. It is likely that the results could be strengthened and there may be a possibility of determining an association between exclusive breastfeeding and maternal control over eating behavior and physical activity. Another limitation of the IFPSII and the Y6FU involves the response rate. 48 percent of respondents were unable to be contacted or simply refrained from participating in the Y6FU. Subsequently, it is possible that there may have been a large number of African American mothers or WIC participants among the 48% of unreachable respondents. Other limitations involve social desirability, culture, and having access to medical records to cross-reference data. For example, there may have been mothers who failed to disclose accurate information or felt the need to favorably answer survey questions regarding their breastfeeding practices, maternal control, and child health behaviors, due to fear of being labeled an unfit or negligent mother.

Moreover, it was not documented in the IFPS II and the Y6FU if there were mothers who were physically unable to breastfeed after expressing their intent. It is possible that there were mothers who were unable to breastfeed as a result of previous surgical procedures, the use of illicit drugs, prescribed medications, a baby's lack of a sufficient suckling reflex, or even extreme discomfort. If there was a way to obtain access to medical records to verify the health information for mothers and children the validity of the results for both the primary study and the secondary analysis could be improved.

In conclusion, the IFPS II and the Y6FU did not categorize data between rural and urban populations. Because there are cultural differences by region, breastfeeding rates and parenting styles may differ in various geographic locations. Because WIC

participation is high in the southeast and far west (National WIC Association, 2013), it would have been advantageous to utilize the technology of a geographic information system to construct a map to compare exclusive breastfeeding, child health outcomes, and WIC participation rates throughout the United States.

Strengths of the Study

The Infant Feeding Practices Study II was created in response to the need for improving the health status of women and children and provided information about breastfeeding, hospital experiences, postpartum depression, infant feeding and sleeping patterns, as well as WIC participation. For the follow-up study, mothers were mailed a questionnaire or interviewed by phone to provide information about their long-term experiences of infant feeding, including child behavior and development, maternal feeding styles, physical activity levels, food and home environments, oral health, and family medical history.

This dataset was most suitable for this study as the IFPS II and its Y6FU is the largest longitudinal study conducted on infant feeding in the United States. Secondly, the study used a prospective design in which data was collected for an extended period of time. In regard to internal validity, participants began providing information from the third trimester of pregnancy until 1 year postpartum and approximately 6 years later. Because data were collected in monthly intervals, there was less potential for recall bias. According to Hawkins, Stern and Gillman (2013), a mother's recollection of breastfeeding is both reliable and valid within 3 years postpartum. Also, the questionnaires used in the IFPSII and Y6FU were tested in a pilot study beforehand and

survey questions were based on established national surveys and published scales so the results could be more readily compared to other studies. Finally, the detailed nature of survey questions provided a basis for exploring the intricacies of maternal and child health behaviors.

Recommendations for Future Research

This study has contributed to newfound knowledge by examining the collective influence of breastfeeding and maternal control as a precursor for preventing childhood obesity among low-income African American children. While the results of this study demonstrated that there were high levels of maternal control among WIC mothers, further research is needed to explore this concept in relation to breastfeeding. Just as the WIC program may have been instrumental in helping mothers attain high levels of maternal control over eating behavior and physical activity, the systems based approach of the WIC program may be the culprit of altering the breastfeeding dynamic in the field of public health.

With this in mind, researchers should understand the importance of replicating another secondary analysis using the IFPSII and the Y6FU that is more inclusive and examines all mothers who breastfed their infants at any point in order to determine if there is a true association with maternal control over child health behaviors. By analyzing all races and all breastfeeding practices, regardless of WIC participation, the outcomes of the study may be more meaningful for those who are invested in breastfeeding promotion and maternal and child health.

Of studies that have utilized the IFPSII and its Y6FU, none have specifically examined the potential association between breastfeeding practices and the concept of maternal control over child diet and physical activity levels (Fein, Li, Chen, Scanlon, & Grummer-Strawn, 2014; Li, Scanlon et al., 2014; Perrine et al., 2014). Given this gap in the literature, and the findings from this study, there is a need for more thorough research on early breastfeeding practices and child dietary patterns later in life. As mothers who breastfeed are more likely to have children who are willing to eat fruits and vegetables during complementary feeding (Perrine et al., 2014), it is possible that breast milk helps children develop a palate that is more accepting to healthier foods.

Bandura's social cognitive theory has been used in countless studies to help researchers dissect the underlying meaning of behaviors that are often influenced by one's environment through human interaction and the subconscious mind. In a secondary analysis conducted by DiSantis et al. (2013) it was discovered that mothers who breastfed were more responsive to their child's hunger cues during infancy. This leads to the possibility of breastfeeding mothers developing a sense of nonverbal communication that may be useful in the identification and development of strategies to prevent childhood obesity by way of breastfeeding. Because breastfeeding WIC mothers were found to have high levels of maternal control in restricting fast food and monitoring junk food at six years of age there is a need to further investigate the possibility of food parenting practices dictating child health outcomes. Nonetheless**,** it is still unknown if mothers who exclusively breastfeed are more inclined to monitor their child's eating habits and levels of physical activity years after giving birth.

For this study, breastfeeding and maternal control were based solely on the perspective of the mother and the magnitude of her control in her relation to her child's behaviors. It may be beneficial for future researchers to also look at the impact of maternal control from the child's perspective as well as compare maternal and paternal control factors for a more family-based assessment. Other avenues for future research should be grounded in the cumulative nature of the social determinants concerning breastfeeding and childhood obesity. By improving the understanding of the psychological and social determinants that often present as barriers to breastfeeding along with obesogenic predictors through qualitative and mixed methods studies, researchers may develop a new conceptual framework that is conducive for tackling low breastfeeding rates and the overwhelming number of children whose quality of life is threated due to being overweight and obese.

Implications for Social Change

The social implications of a mother's individual choice to breastfeed should take precedence in the field of public health, as it is a protypical example of how two individuals can ultimately impact the population in the highest regard. Breastfeeding not only improves the health of mothers and children, but it positively influences the entire family. Although there is a symbiotic relationship that evolves between a mother and child during the act of breastfeeding, the benefits of breast milk are invaluable as it can be used to promote health, aid in disease prevention, and therefore help reduce health disparities. Some consider breastfeeding to be a fundamental component of children's rights that harvests the equal opportunity for supreme standards of health (Alipui, 2012).

By placing emphasis on breastfeeding practices, the social determinants and environmental factors that often influence one's health may become secondary. Considering that there is no monetary cost to breastfeed and breastfed infants tend to require less medical attention and ultimately have superior health outcomes, breastfeeding should be deemed as one of the most cost-effective forms of primary prevention.

Albeit that the Women, Infants, and Children Nutritional Supplementation Program is based on prevention, health education, referrals to social services, food benefits, peer counseling, and improved health care access for millions of women and children (National WIC Association, 2013), there is virtue in using WIC as a conduit for the potential enhancement of other public health programs that specialize in the improvement of child health outcomes through breastfeeding promotion and parental development. The WIC Public Health Model (see Figure 2) outlined in Chapter 2 further demonstrates how WIC can be used within a public health infrastructure to create social change by improving breastfeeding knowledge and practice, increasing the use of health care, and improving nutrition through health education and food supplementation. Depending on the time in which mothers enroll in the WIC program, encouraging prenatal care and regular check-ups helps reduce the number of preterm and low birth weight babies, which supports adequate physical growth and cognitive development and ultimately reduces long term health care costs. On account of these extensive benefits of the WIC program, the possibilities to directly influence social change are promising.

With this study focusing on exclusive breastfeeding and the concept of maternal control among African American WIC participants, the social change implications are associated with the interplay of a variety of social, cultural, economic, environmental, and psychological factors that outline the health behaviors of women and their children. With parental feeding styles representing both a cause and effect of childhood obesity, (Thompson et al., 2013) this study has helped develop a new rationale for understanding the concept of maternal control through breastfeeding and child health behaviors in low-income African American populations. For example, African American children who are breastfed have higher IQs (Quigley et al., 2012), have less incidence of chronic disease (Bomer-Norton, 2013; Kelishadi & Farajian, 2014), and have a higher chance of growing up to live a healthier lifestyle (Grzelak et al., 2014; Reynolds et al., 2013), which promotes better economic opportunities that translate into a better society altogether. Specifically, children who learn model health behaviors from their parents and are guided by the proper forms of health education have been found to live healthier lifestyles, be within a normal weight range, and are less likely to develop diabetes, hypertension, asthma, and have poor levels of self-esteem and body image (Centers for Disease Control and Prevention, 2015a).

In essence, there is potential for a three-fold investment into the health and wellbeing of women and children when the benefits of breastfeeding and maternal control are syndicated through a systems-thinking approach to develop multilevel public health programs. With an increase in breastfeeding rates, less incidence and prevalence of childhood obesity, and children living healthier lifestyles well into adulthood, there is

merit in using this study as an outlet for the provision of public health initiatives designed for women and children of all races and socioeconomic backgrounds. Therefore, the platform for social change begins with breastfeeding, but it is only the beginning of the battle for social equity and improving maternal and child health worldwide.

Recommendations for Practice

The leading recommendation for public health practice is to build a brand for breastfeeding that influences social change by improving breastfeeding outcomes, mobilizing partnerships, and reinstating the social normalcy that once was associated with the act of breastfeeding. This includes lactation support in the workplace and more legislation to safeguard a woman's right to breastfeed in any public or private location. Additionally, sociocultural based interventions are needed to not only encourage African American women to initiate breastfeeding, but to continue on beyond the minimally recommended 6 months.

According the Maternal, Infant, and Child Health (MICH-21-24) objectives set forth by Healthy People 2020 (2017), public health professionals should aim to increase the proportion of infants who are breastfed, which includes any breastfeeding and exclusive breastfeeding for up to 1 year. Other objectives include increasing the proportion of employers that have worksite lactation programs, reducing the proportion of breastfed newborns who receive formula supplementation within the first 2 days of life, and increasing the proportion of live births that occur in facilities that provide recommended care for lactation mothers and their babies. Based on these guidelines, the WIC program is exemplary as mothers who exclusively breastfed in the hospital after

giving birth were eight times more likely to continue breastfeeding for 12 months compared to mothers who did not breastfeed in the hospital (Langellier et al., 2012).

With a cohesive network made up of family empowerment, social media, and peer counseling, mothers could evolve to normalize breastfeeding and take responsibility for their child's health outcomes from inception. Another recommendation is to design initiatives that mimic the incentive bonuses that are associated with Medicare and Medicaid. For example, every dollar spent on a WIC mother saves $4.21 in Medicaid costs (Chock et al., 2014). If there were monetary incentives for physicians who recommended breastfeeding promotion programs like WIC, the low breastfeeding rates in the United States may improve. Moreover, several WIC participants admitted that the one-on-one support from the peer-counseling program increased their confidence and determination to overcome some of the barriers associated with breastfeeding (Robinson et al., 2016). Therefore, the peer-counseling component is a unique tactic that could be streamlined into an ongoing grand-scale breastfeeding support system for women.

Ultimately, this study serves as a nexus to bridge the gap between conventional healthcare and prevention based public health practice. In order to improve health care services for new and expecting mothers, physicians should begin to incorporate the WIC program into standard prenatal care by way of government funding. Although WIC was originally designed to target low-income women, its services have proven to be instrumental in promoting breastfeeding among its participants. According to the National WIC Association (2013) women who have participated in its breastfeeding support activities have had higher instances of breastfeeding initiation and longer

breastfeeding duration than the national average. Based on the results of this study and mothers having high levels of maternal control, the WIC peer counseling program may be beneficial in improving the breastfeeding rates among all women, despite income or community infrastructure.

Thus, the findings from this study may be useful for targeting culturally sensitive messages regarding breastfeeding to those with the greatest need. Policy makers, public health educators, medical professionals, and breastfeeding promotion programs may be enhanced through a more comprehensive understanding of the association between breastfeeding practices and child health outcomes. With this in mind, the knowledge generated from this study will be disseminated to several maternal and child health and women's health journals, as well as national conferences, such as the Global Maternal Newborn Conference, the American Public Health Association, and the Academy of Breastfeeding Medicine International Meeting in hopes of building a consensus that supports the power of breastfeeding and the concept of maternal control.

Conceptual Model of Study

Given the research in the current literature on the benefits of breastfeeding and the success of the WIC program in providing low-income minority women with access to heath education, emotional support, and resources to enhance the lives of children, there should be more investment in helping children to obtain a supreme start in life. In order to support the recommendations that have been made for practice, a model was created to visually depict the relationship between the variables of study, the social cognitive theory, and the implications for social change.

In Figure 7, the three fundamental features of this study included the concept of maternal control over child health behaviors, exclusive breastfeeding, and examples of social change, which are shown in an orange, pink, and purple gradient color way. The two yellow pillars represent an extension of the concept of maternal control and are the dependent variables of eating behaviors and physical activity levels of children at 6 years of age. The center of the model was inspired by the socio-ecological model, which begins with a public health focus on the WIC program that provides direct support for mothers and indirect support for children. Exclusive breastfeeding is not only the independent variable of study, but it also serves as the underlying foundation of the relationship between mothers and children that was reinforced through WIC. The tenets of the social cognitive theory are in blue and are used to rationalize the actions and behaviors of WIC participants and the aggregate influence on the dependent variables of maternal control over eating behavior and physical activity.

Lastly, the five banners of social change are categorized by genre to relate to every aspect of this study. The first banner describes the impact of breastfeeding, which reduces infant morbidity and mortality and has protective factors against obesity. The second banner lists the breastfeeding promotion component of the WIC program, which provides support for disadvantaged populations. The third banner discusses the all-encompassing platform potential for health equity, which is embedded in breastfeeding initiatives and the overall improvement of maternal and child health. The fourth banner outlines how the concept of maternal control positively influences children to live healthy lifestyles into adulthood and the final banner of future research reiterates the fact that the

association between exclusive breastfeeding and maternal control over child health behavior has yet to be determined.

Conceptual Model of Study

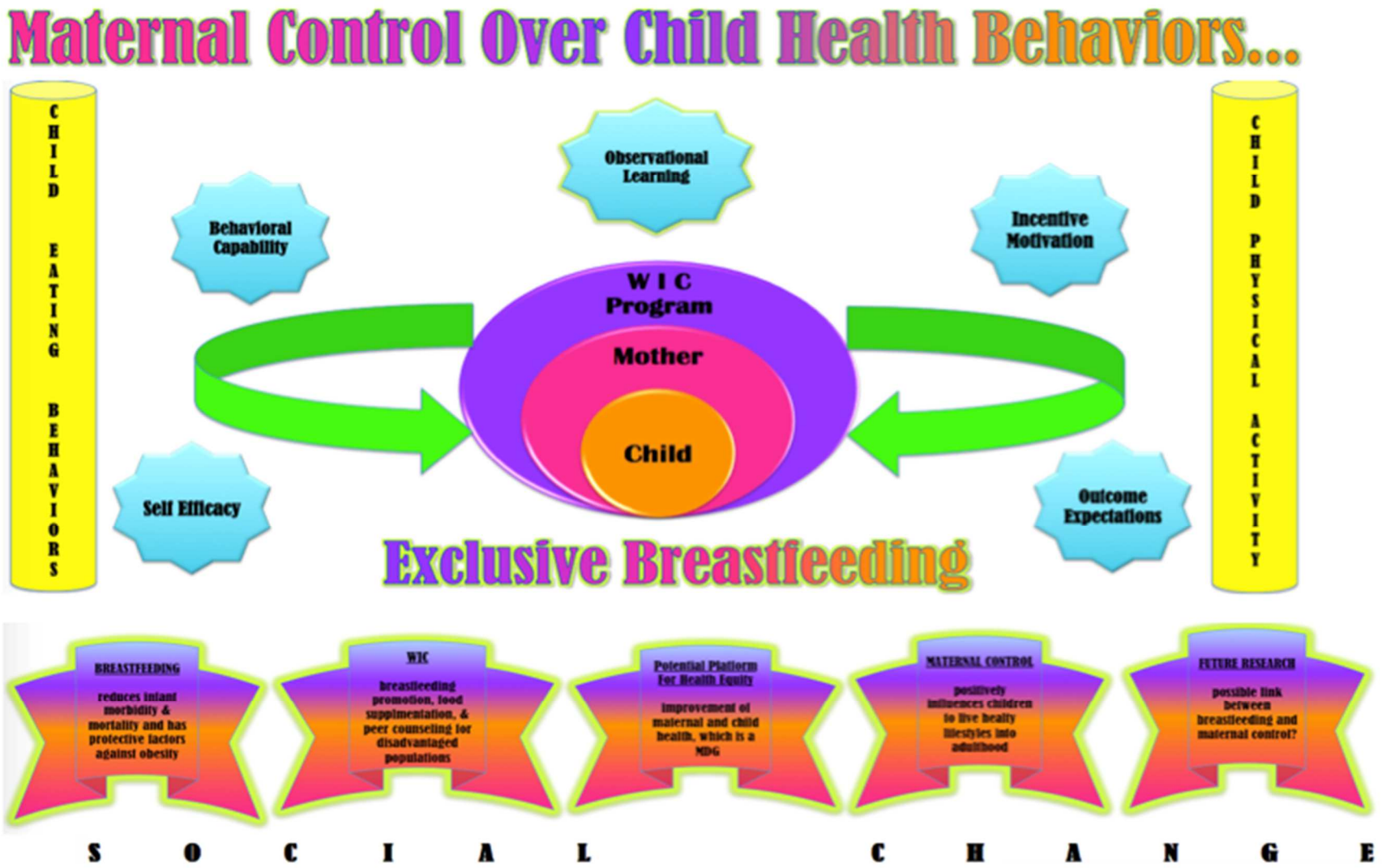

Figure 7: Conceptual Model of Study
Note: Electronically created based on the outcomes of this study

Summary and Conclusions

The benefits of breastfeeding are endless and extend well beyond the first few years of life. Many researchers have referred to breast milk as liquid gold because of its extensive protective properties that provide nourishment and contribute to child growth and cognitive development (Mathur & Dhingra, 2014). Although breastfeeding is the purest form of vitality in that it is essential for the health and survival of mothers and infants across the globe, breastfeeding rates in the United States are among the lowest in the nation. Only 39.1% of African American women breastfeed for a baby's first 6 months of life compared to 57.9% of White women and 45.6% of Hispanic women (Centers for Disease Control and Prevention, 2016a). Considering that African American women are the least likely to breastfeed compared to any other racial group, Spencer and Grassley (2012) claim that many health disparities may be a direct result of poor breastfeeding rates.

Because Black children are twice as likely to be obese compared to White and Hispanic children (Dixon et al., 2012), they are more predisposed diabetes, hypertension, and cardiovascular disease (Lefebvre & John, 2014; Moss & Yeaton, 2014; Yan et al., 2014). Researchers estimate that over 2.8 million deaths are attributed to obesity each year (Yan et al., 2014), which poses a significant threat to humanity. Despite these alarming statistics, children are not to blame. Mothers are often responsible for developing the food practices of children before they are influenced outside of the home. Taking into account that a mother's jurisdiction over her child's diet and activity levels are a direct marker of maternal control, this study

was designed to explore and understand the potential association between exclusive breastfeeding and the concept of maternal control in regard to child health behaviors.

The results proved that African American women who were enrolled in the Women Infants and Children Nutritional Supplementation Program and exclusively breastfed their infants at three months had high levels of maternal control over child physical activity and eating behaviors. In conclusion, there was no way to determine an association between exclusive breastfeeding and maternal control over physical activity and eating behaviors in children at 6 years of age. One possible explanation is due to the fact that there were no women who continued to exclusively breastfeed at 6 months. Also, with such a small number of women who exclusively breastfed at 3 months, further research is needed to confirm the presence of an association. Nonetheless, these limitations are stringent upon more breastfeeding support for not only WIC participants, but all mothers who are capable of providing breast milk to their infants.

As a scholar practitioner who has thoroughly explored breastfeeding, parental influence, and maternal and child health, my passion lies within creating a comprehensive public health agenda for the enhancement of breastfeeding initiatives for the betterment of women and children through the Women Infants and Children Nutritional Supplementation Program. Breastfeeding promotion calls for collective action between health professionals, WIC clinics, lactation consultants, schools, community centers, legislators, and other institutions that are invested in improving the health outcomes of women and children. Based on my research, I recommend that the current public health agenda concerning breastfeeding prioritize the cultivation

and encouragement of a new breastfeeding culture that increases awareness to improve the number of people who benefit from breast milk, despite race or social circumstance.

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