<u>DOES THE TYPE OF DELIVERY AND HOSPITAL PRACTICES IMPACT
BREASTFEEDING SELF- EFFICACY AND OUTCOMES AT 10 DAYS AND
8 WEEKS POSTPARTUM</u>

by

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Does the Type of Delivery and Hospital Practices Impact Breastfeeding Self Efficacy and
Outcomes at 10 Days and 8 Weeks Postpartum?

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## DEDICATION

This work is dedicated to my husband, and children who have given me support encouragement and motivation, my friends, & coworkers for their unfailing support at every turn and to the Health Care Providers who gave me "the gift of time."

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# ABSTRACT

DOES THE TYPE OF DELIVERY AND HOSPITAL PRACTICES IMPACT
BREASTFEEDING SELF EFFICACY AND BREASTFEEDING OUTCOMES AT 10
DAYS AND 8 WEEKS POSTPARTUM?

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George Mason University, 2014

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This prospective non-experimental study was conducted to explore the impact of

unplanned cesarean section delivery on breastfeeding self-efficacy and breastfeeding

outcomes for first time mothers when the Centers for Disease Control and Prevention

(CDC) recommendations to support breastfeeding were implemented. First time mothers

experiencing an unplanned cesarean section were compared to first time mothers

delivering vaginally on breastfeeding self-efficacy scores and breastfeeding outcomes at

10 days and 8 weeks postpartum. A sample of 250 mothers was recruited for the study at

24 to 48 hours postpartum. Follow-up surveys of breastfeeding self-efficacy and

breastfeeding outcomes were mailed to the mothers' homes for completion and to return

to the researcher at 10 days and 8 weeks postpartum. Although the initial data were rich

in descriptive characteristics of the mothers, attrition at 10 days and 8 weeks was high,

resulting in a return rate of less than 50%. At 10 days postpartum, 134 surveys were

returned, and at 8 weeks, 111 surveys were returned, yielding only 93 complete sets of data. The data were evaluated with multiple regression, ANOVA, ANCOVA, and chi-square analysis to compare the two groups, cesarean birth mothers and vaginal birth mothers, on breastfeeding self-efficacy and breastfeeding outcomes. Results indicated little significant difference in breastfeeding self-efficacy and breastfeeding outcomes between the groups. Although there were several significant correlations between the recommended practices of the CDC in the Maternal Practices and Infant Nutritional Care variables (mPINC), Breastfeeding Self-Efficacy (BFSE) scores, and breastfeeding outcomes, the overall models only indicated time to the first feeding and the number of supplemental feedings impacted the mothers' breastfeeding self-efficacy. Future breastfeeding studies should be conducted using an intervention to increase breastfeeding self-efficacy, and thus positive breastfeeding outcomes.

**CHAPTER ONE: INTRODUCTION**


Despite evidence to suggest breastfeeding is a low cost preventative behavior that may save families from devastating disease and death, as a nation we have failed to meet breastfeeding goals set by the Healthy People initiative. Healthy People is a national cooperative effort by government agencies and professional organizations to improve the health of all Americans by establishing health goals to promote health and prevent disease. This is accomplished by making changes in lifestyles and other health factors (www.healthypeople.gov).

Healthy People goals for 2020 are 82% of mothers initiating breastfeeding, with 46% still exclusively breastfeeding at 3 months of age and 25% exclusively breastfeeding at 6 months of age (Centers for Disease Control and Prevention [CDC], 2013). Exclusive breastfeeding refers to feeding the infant nothing other than breast milk (American Academy of Pediatrics, 2012). Increasing breastfeeding initiation and duration has the potential to improve the health of children from all socioeconomic groups and to decrease morbidity and mortality as well as health care costs for pediatric asthma, otitis media, respiratory infections, and many other childhood diseases (Bartick & Reinhold, 2010). Other breastfeeding goals of Healthy People 2020 include increasing workplace support for lactation, reducing the number of breastfed infants who are supplemented with formula during the first 2 days of life, and increasing the number of births that occur in

facilities that demonstrate optimal care of breastfeeding infants and support for their

mothers (CDC, 2013).

Every 2 years, the CDC administers the National Maternity Practices in Infant

Nutrition and Care (mPINC) survey to all hospitals and birth centers in the United States

that provide care to mothers and infants. The survey provides specific opportunities to

improve mother and infant care in hospitals. Virginia ranks low in supporting

breastfeeding as the state ranks 31 out of the 53 states surveyed and there is only one

hospital designated "Baby Friendly" in the state (CDC, 2013). " Baby Friendly" hospitals

have met rigorous criteria, set by the World Health Organization and the United Nations

Children's Fund (UNICEF), to ensure the optimal environment for mothers and infants

with breastfeeding as the standard of infant feeding (DiGirolamo, Grummer-Strawn, &

Fein, (2001).

One of the factors that impacts breastfeeding is self-efficacy. A mother's beliefs

that breastfeeding will improve her infant's well-being and her actions will produce the

outcome she desires impact breastfeeding outcomes (Dennis, 1999). Self-efficacy may

determine how much work the mother will devote to breastfeeding and whether she will

experience self-enhancing thought patterns. Self-efficacy also determines whether the

mother will continue to persevere with breastfeeding in the face of difficulties.

One of the factors known to impact breastfeeding rates is delivery by cesarean

section. Rowe-Murray and Fisher (2002) found cesarean section delivery to delay the

initiation of breastfeeding. Mothers who delivered by cesarean section rarely experienced

skin-to-skin contact with their infants, a practice supported by research as improving

breastfeeding success. In a 2010 study of the effect of elective cesarean delivery on breastfeeding, vaginal delivery was found to have higher breastfeeding rates during hospitalization and at follow-up 6 months after birth (Zanardo et al., 2010). However, a recently published study of 2,500 births found mothers who experienced an unplanned cesarean section were more likely to initiate breastfeeding (Watt et al., 2012).

The latest figures available were collected between 2006 and 2012, reported a cesarean section rate of 32%, an increase of 53% from 1996 (Osterman, & Martin, 2014) . Cesarean section rates vary by the size of the hospital and the referral services available. Cesarean delivery is associated with higher rates of surgical complications, maternal readmission to the hospital, and complications for the infant that may require NICU admission, thereby having a major impact on breastfeeding success (Menacker & Hamilton, 2010).

There is clear evidence that breastfeeding reduces Sudden Infant Death Syndrome (SIDS) by as much as 36% (Ip, Chung, Raman, Trikalinos, & Lau, 2009). The incidence of other diseases, including asthma, gastrointestinal infections, upper and lower respiratory diseases, ear infections, childhood obesity, and diabetes mellitus Type 2, was found to be decreased in children who were breastfed (Ip et al., 2009). Infections such as cytomegalovirus, Lyme disease, measles, tuberculosis, herpes simplex virus, and varicella-zoster virus are less likely to occur in breastfed infants (Lawrence & Lawrence, 2011). The benefits of breastfeeding for infants also include reduced rates of two childhood types of leukemia: acute lymphocytic leukemia and acute myelogenous leukemia (Ip et al., 2009). Benefits for the mother include a 10% reduction in the rate of

ovarian cancer and a small reduction in the rate of premenopausal breast cancer as well as decreased bleeding in the immediate postpartum period (Ip et al., 2009).

There are a few reasons mothers are told not to breastfeed. Human immunodeficiency virus type 1 and human T-cell lymphotropic virus type 1 and 2 are the only two absolute contraindications to breastfeeding in developed countries (Lawrence & Lawrence, 2011). However, in developing countries, infant death rates are increased when HIV positive mothers do not breastfeed. Malnutrition and infectious diseases are high in non-breastfed infants. Infants who are exclusively breastfed and given antiretroviral treatment for 6 months have a lower rate of acquired HIV infections than infants who receive formula or a mixed diet of breast milk and other liquid supplements (American Academy of Pediatrics, 2012). There are a few maternal diseases that can delay breastfeeding until treatment has begun, including hepatitis A & B. Mothers may experience insufficient lactation, a rare contraindication to exclusive breastfeeding, related to various physiologic and anatomic factors (Neifert, 2001). Professional management of breastfeeding can overcome many obstacles and is supported by evidenced-based practice so most women can breastfeed.

### Statement of the Problem

One of the factors that can impact breastfeeding rates is delivery by cesarean section. Rowe-Murray and Fisher (2002) found cesarean section delivery to delay the initiation of breastfeeding. These mothers rarely experienced well researched practices that improve breastfeeding success such as skin-to-skin contact with their infants, early initiation of breastfeeding, rooming-in most of the time, and no supplemental feedings

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without a medical indication (Edwards & Philipp, 2010). Increasing cesarean section rates are likely to impact breastfeeding initiation and the ability of these mothers to sustain breastfeeding. Mothers who experience cesarean section births may also lose confidence in the ability of their bodies to nurture their infants, experience more pain, and encounter difficulty managing breastfeeding.

## Purpose

The purpose of this study was to evaluate the impact of unplanned cesarean section on breastfeeding self-efficacy and breastfeeding outcomes for first time mothers who experienced breastfeeding support similar to that given to mothers who deliver vaginally. Breastfeeding support was evaluated by determining the ability of the hospitals and mothers to follow the recommendations of the CDC thorough its mPINC study (Manninen et al., 2008).

## Limitations

Mothers in the postpartum period are interrupted many times during their hospitalization. The intrusion of a researcher into their hospital stay may not have been welcome. Many postoperative cesarean section mothers are sedated with analgesia to manage their pain and may not have been receptive to a researcher. The number of family members and friends who visit the hospital is also unrestricted and may have been a deterrent to study participation. Women's recall of time spent skin-to-skin with their infants and feedings may have been inaccurate due to the amount and quality of the postoperative medications they received. Only women who spoke and understood English were included in the study due to the complexity of the hospital-required consent

forms and the researcher's own language limitations, so the sample population was also limited.

## Significance of the Study

The advantages of breastfeeding are well documented and include improved nutritional, immunological, psychological, economic, and environmental outcomes. Numerous studies have identified breastfeeding self-efficacy to be a key factor in predicting the initiation and duration of breastfeeding. Mothers who deliver by cesarean section are more likely than mothers who deliver vaginally to have difficulty nursing their infants. Postoperative pain and difficulty moving around and positioning the infant comfortably may lead to a more difficult breastfeeding course. The cesarean section rate in the United States is rising and was reported by the CDC (2010) to have increased by 54% over the last 10 years. Although much information is available about lower breastfeeding rates in women who deliver by cesarean section, little information has been collected about the effects of unplanned cesarean section and self-efficacy as applied to the woman who chooses to nurse her infant. Additionally, the low mPINC survey scores in Virginia are of concern. To identify more specific areas that would enhance mothers' breastfeeding self-efficacy and develop educational strategies for the postpartum period that would enhance the implementation of the CDC recommendations for promoting breastfeeding, these issues must be addressed. Table 1 describes the research variables.

Table 1

Study Variables

| Variable | Conceptual Definition | Operational Definition |
|---|---|---|
| Breastfeeding Self-efficacy | Refers to a mother's perception of her ability and confidence to breastfeed her newborn. Breastfeeding self-efficacy impacts the woman's choice to breastfeed, how much effort she will expend to breastfeed, and how she will meet challenges during breastfeeding (Dennis, 2003). | For the purposes of this study, breastfeeding self-efficacy was defined as scores on the BFSE-SF survey given 24 to 48 hours postpartum and again 10 days and 8 weeks postpartum. |
| Mode of Delivery | Cesarean section is the surgical delivery of an infant through an abdominal incision.<br><br>Vaginal delivery refers to childbirth through the birth canal. | Response to an item asking whether the mother delivered by cesarean section. |
| Breastfeeding Outcomes | Full breastfeeding includes "exclusive" feeding when no other liquid or solid is given to the infant and "almost exclusive," which includes vitamins, minerals, water, juice, or ritualistic feeds given infrequently in addition to breast milk.<br><br>Partial breastfeeding includes "high," when more than 80% of feeding is breast milk; "medium," when 20 to 80% of feeding is breast milk; and "low," when less than 20% of feeding is breast milk.<br><br>Token breastfeeding is when minimal breast milk is given occasionally or irregularl(Labbok&Krasovec,1990). | Response to two items: How many times a day do you feed your infant? How many formula feedings does your infant receive in an average day? |

Table 1 (continued)

Study Variables

| Variable | Conceptual Definition | Operational Definition |
|---|---|---|
| Skin-to-Skin Contact | Ideal skin-to-skin contact with the newborn is defined by mPINC as placing the infant clothed only in a diaper on the mother's bare skin for 30 minutes or longer within 1 hour of birth for vaginal births and within 2 hours of birth for cesarean births | Response to an item asking if infant was placed on mother's bare skin within the first 2 hours of birth |
| Formula Feedings | As defined by mPINC, supplemental feedings to breastfed infants are rare. | Response to an item: How many formula feedings has your baby had? |
| Rooming-in | As defined by the mPINC, healthy full-term infants remain with their mothers for at least 23 hours per day throughout the hospital stay. | Response to an item: How many hours a day does your baby stay in the room with you? (Except for brief visits to the nursery) |

**Research Questions**

1. Does type of delivery, skin-to-skin contact, time of first feeding, number of supplemental feedings, and hours rooming-in with the infant predict breastfeeding self-efficacy for first time mothers at 24 to 48 hours, 10 days, and 8 weeks postpartum?

2. Do first time mothers who deliver by unplanned cesarean section and those who deliver vaginally have different breastfeeding self-efficacy at 10 days

postpartum when both have experienced skin-to-skin contact within the 1 to 2

hours after birth, the first breastfeeding within the first to 2 hours, rooming-in

with the infant, and limited supplemental feedings?

3. What combination of mPINC variables and delivery mode best predicts

   breastfeeding outcomes (defined as full, partial, token, and none) among first

   time mothers at 8 weeks postpartum?

4. Is there a difference in breastfeeding outcomes between first time mothers

   delivering vaginally and those delivering by cesarean section when adjusted

   for breastfeeding self-efficacy scores at 10 days postpartum?

5. Is there a relationship between mode of delivery and breastfeeding outcomes

   at 10 days and 8 weeks postpartum?

## Theoretical Framework

Numerous theories have been used to predict health behaviors and design

interventions that are likely to promote healthy behaviors Social cognitive theory can be

used to help define the variables that influence the desired behavior, describe interactions

among these variables, and predict anticipated outcomes.

**Social Cognitive Theory**

Social cognitive theory refers to conscious thoughts that guide actions. Bandura

(2001) suggested humans function by making thoughtful decisions that self-regulate and

reflect as they adapt and change. This was a change in thought from earlier views of

humans who were thought to be shaped by their environment and inner impulses (Pajares,

2002). Bandura's (2001) later work described human functioning as concerned with thoughtful decision-making, vicariousness, self-regulation, and reflection processes as they adapt and adjust to change. Humans are often likely to be proactive, self-organizing, self-reflecting, and self-regulating when approaching a new activity. This new view of human functioning is seen as the result of an individual's interpretation of the impact of his or her own behavior and how it changes the environment as well as the talents the individual possesses that can help understand and alter subsequent behaviors. This work was the basis for Bandura's view of *reciprocal determinism*. This theory posits that cognition, affect, and biological events, combined with behavior and environmental influences, interact to form a triadic reciprocity. Bandura then changed the title of his social learning theory to social cognitive theory to recognize the role of cognition in an individual's ability to produce behaviors that are based in reality, self-regulated, and well considered.

**Social Cognitive Theory and of Self-efficacy**

Bandura's (2001) theory comprises three features: intentionality, forethought, and self-reactiveness. *Intentionality* is not just a plan to bring actions to fruition but also a proactive determination to cause a specific action or behavior to occur. Not all future plans are specified in complete detail because exact details often cannot be conceptualized (Bandura, 2001). Intention focuses on action plans; when the initial plan or intention is completed, it is then adjusted and plans are revised or updated as new information is gained. If the intention involves others, their participation is elicited and joint coordination of activities should occur (Bandura, 2001). Participation requires that

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both parties join their self-interest into a common goal. The reciprocal nature of human functioning makes it possible to improve functioning by directing resources toward improving emotional, cognitive, or motivational factors; improving behavioral competencies; or changing the social conditions in which people live (Pajares, 2002).

*Forethought* involves goal-setting and anticipation of likely outcomes to the behavior. This allows humans to select courses of action that are likely to produce the outcome they seek and avoid outcomes they see as unsatisfactory. Forethought provides direction, understanding, and meaning to one's life. As people grow and develop their life course they continue to plan, reorder their goals, and restructure their lives. Future events become motivators of behavior and a form of anticipatory guidance, which is directed by future goals and anticipated outcomes. In general, people choose behaviors that are likely to produce the desired outcomes and avoid those seen as non-productive. People are not really motivated by material or social goals, but after establishing personal values, people regulate their behavior by self-evaluation (Bandura, 2001).

The third component of social cognitive theory is *self-reactiveness*, which refers to motivation and self-regulation. This is not only the ability to make decisions and plans, but the ability to design courses of action and to motivate one's self to implement the plan. Self-reactiveness comprises self-monitoring, performance self-guidance in accordance with one's own personal values, and corrective actions. Monitoring one's own actions is the first step toward modifying those actions. Reflecting on one's actions gives the individual an opportunity to compare those actions with goals and standards set for this activity. This gives the individual self-direction toward the goal and helps create

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incentives to support efforts toward meeting the goals. Humans perform in ways that give them self-satisfaction and a sense of pride, enhances their self-worth, and avoid activities that cause them dissatisfaction, devaluation, and self-censure.

Bandura (2001) felt humans could not function without introspection, as to look into their own consciousness is to make sense of their behavior and psychological processes and aids understanding in how humans process and interpret environmental outcomes. Social cognitive theory is based upon the notion that humans are proactively engaged in their own growth and can control their actions to create the outcomes they seek (Pajares, 2002). Key to this theory is the thought that individuals possess beliefs that enable them to control their thoughts, feelings, and actions so that what people believe is key to how they behave. Bandura believed humans are both products and producers of their own environment and work together on shared beliefs about their abilities and goals to improve their lives.

One of the primary steps toward modifying behaviors is to monitor the pattern of behavior, the cognitive thoughts behind this pattern, and the environment in which it occurs. Humans are self-reactive in that they compare their behavior with their personal goals and values. These goals give their behaviors meaning and purpose. People give direction to their behavior and create rewards to keep themselves focused on achieving their goals. Thus, they perform tasks that are satisfying and sustain their sense of pride and self-worth. People feel dissatisfaction, devaluation, and self-censure when they behave in ways that do not support their goals and values. Humans are more motivated by

challenging goals and their importance in their lives. As they meet challenges, their personal goals are increased and their understanding and competencies are expanded.

Another component of social cognitive theory is *self-reflectiveness* (Bandura, 2001). Humans retain the ability to critically evaluate their behavior and the adequacy of their efforts toward attaining their goals. Humans also evaluate the meaning of their efforts and choose behaviors and thoughts that satisfy their values. Specifically, humans evaluate their ability to predict and operationalize their thinking toward the desired outcomes. The strongest beliefs center on the individual's belief that he or she can control his or her own functioning and environmental factors.

*Self-efficacy* is the basis for human behavior. Unless people believe their actions can produce the desired results there is little incentive to act or sustain their actions when difficulties arise. This is a powerful belief that the individual has the ability to produce the desired behavior through his or her own actions.

Self-efficacy also affects the individual's ability to adapt and change and determine whether he or she is cognitively positive or more negative in thinking, which then helps the individual be more self-enhancing or self-deprecating. Self-efficacy also determines how people choose courses of action, how much effort they put forth to attain their goals, and how long they will work when things do not go well. Humans also must consider whether failing to reach a goal will inspire them to work harder or cripple them with self-doubt. Being responsible for one's health is an illustration of self-regulation. Human health is affected by lifestyle choices and environmental exposures. Humans can

choose to take responsibility for a great deal of their health choices, reducing risk, and living within the current health guidelines.

Social cognitive theory (Bandura, 2001) suggests behavior can be modified by experience, specifically when an individual is involved in the activity so his or her abilities are positively reinforced or when the individual has previously been successful at the same activity. The behavior can also be modified by watching another individual perform the activity successfully, by giving performance feedback, and by modifying physiological and affective states so the individual is more comfortable, more rested, or has less anxiety. Bandera (2001) also proposed that performing an activity and seeing the results has the most powerful influence on self-efficacy.

Breastfeeding self-efficacy theory follows Bandura's (2001) social cognitive theory closely. Kingston, Dennis, and Sword (2007) suggested breastfeeding self-efficacy can be enhanced by helping new mothers master the techniques of breastfeeding. Self-efficacy can be enhanced by role modeling when the role model is similar in age, socioeconomic status, and race. The role model talks about her methods for success and her thought processes while breastfeeding, which may help the new mother succeed. Multiple role models are considered helpful as well. Another component of social cognitive theory is giving feedback. In the early period of breastfeeding this is most effective when given by persons the mother perceives to be knowledgeable and reliable (Kingston et al., 2007). The final component of the theory, improving the mother's physical or emotional state, can be essential in promoting self-efficacy through making

the new mother more comfortable, relieving her pain or fatigue, and assisting with stress and anxiety (Kingston et al., 2007).

Breastfeeding self-efficacy refers specifically to how a new mother perceives her ability to nurse her infant and is a predictor of breastfeeding in that self-efficacy determines whether the mother decides to breastfeed or not, how much work she will devote to breastfeeding, whether she will experience self-enhancing or self-defeating thought patterns, and how she will react to any difficulties with breastfeeding (Dennis, 1999).

Increasing breastfeeding duration is a challenge that may be addressed by identifying variables that can be modified such as increasing maternal confidence, social support, and professional support. Social support is well documented in the breastfeeding literature and also by a metasynthesis of qualitative research. Both formal and informal social networks have been found to either negatively or positively impact breastfeeding (Nelson & Sethi, 2005). Mothers consistently identify the infant's father and their own immediate families as being the most significant influences upon their decision-making with regard to breastfeeding initiation and duration (Nelson & Sethi, 2005). The fact that women look to these important social supports is likely related to the level of commitment and life adaptation required by the decision to breastfeed (Nelson & Sethi, 2005).

Professional support also increases breastfeeding, particularly among first time mothers (Humerick, Hill, & Weilhelm, 1997). Professional support may be effective

because it leads to an increase in both knowledge and self-confidence, which have a

positive impact on breastfeeding outcomes (Blyth et al., 2002).

**CHAPTER TWO: REVIEW OF THE LITERATURE**

**Benefits of Breastfeeding**

In 2007, the Agency for Healthcare Research and Quality (AHRQ) commissioned a review of the existing evidence of breastfeeding improving outcomes for mothers and infants (Ip et al., 2009). Over 9,000 abstracts were screened; 43 primary studies on infant health outcomes, 43 primary studies on maternal health outcomes, and 29 systematic reviews or meta-analyses that covered approximately 400 individual studies were included in the report. Each study was evaluated for methodology and graded A for good, B for fair, or C for poor to indicate methodological quality. This grading system reflected the validity and reliability of the studies. Breastfeeding was poorly annotated in the studies as most did not differentiate between exclusive breastfeeding and partially breastfed infants. For this reason, the studies were considered exclusive breastfeeding if the authors of the study defined the breastfeeding as exclusive.

In this review, breastfeeding was associated with a significant reduction in the risk of acute otitis media; when comparing breastfeeding with exclusive bottle feeding, the pooled adjusted odds ratio was 0.77 (95% CI 0.64-0.91; Ip et al., 2009). When comparing exclusive breastfeeding with exclusive bottle feeding, either more than 3 months or 6 months duration, the pooled odds ratio was 0.50 (95% CI 0.36-0.70; Ip et al., 2009). Atopic dermatitis was reduced by 42%, gastrointestinal infections were reduced

by 64%, and lower respiratory tract diseases requiring hospitalization were reduced by 72% in infants who were exclusively breastfed for 4 or more months (Ip et al., 2009).

In infants who breastfed for at least 3 months, the incidence of asthma (when there was no family history of asthma) was reduced by 27% (Ip et al., 2009). In children with a family history of asthma the risk of developing asthma was decreased by 40% if the mother breastfed for 3 months. The relationship between breastfeeding and asthma in the child older than 10 years of age was unclear.

Obesity was also found to be affected by breastfeeding. Good quality studies indicated obesity/overweight decreased by 7% to 24% in adolescence and adult life when the individual was breastfed for at least 3 months (Ip et al., 2009). Type 1 diabetes was reduced by 19% in infants who were breastfed for 3 months and Type 2 diabetes was reduced by 39% in individuals who were breastfed for 3 months (Ip et al., 2009). These studies were not considered well-grounded in methodology because they did not adjust for family history of diabetes, birth weight, socioeconomic status, or maternal body size. A more recent study of 123 children with Type 1 diabetes and their siblings found the diabetic children had a shorter duration of breastfeeding and an earlier exposure to cow's milk (3.3 vs. 4.6 months, $p < 0.001$; Alves, Figueiroa, Meneses, & Alves, 2012).

An association between breastfeeding for 6 months and a reduction in the risk of childhood leukemia was found (Ip et al., 2009). Acute lymphocytic leukemia (ALL) is the most common childhood leukemia, as 74% of children who experience leukemia are diagnosed with this type of leukemia. In comparing length of breastfeeding, less than 6 months and greater 6 six months, results suggested long-term was associated with a

reduction in the risk of acquiring ALL (OR 0.80, 95% CI [0.71, 0.91]; Ip et al., 2009).

The incidence of acute myelogenous leukemia (AML) also was reduced in the

breastfeeding population. For infants with longer terms of breastfeeding (i.e., greater than

6 months), the risk of AML was reduced (OR 0.85, 95% CI[ 0.73, 0.98]). This was not

seen in infants who nursed for less than 6 months (Ip et al., 2009).

The studies reviewed by the AHRQ that were found to have good methodology

showed a 36% reduction in the risk of SIDS for infants who were breastfed compared

with those who were not breastfed (Ip et al., 2009). The infants who breastfed had a

reduction in both the crude and adjusted risk of SIDS (crude OR 0.41, 95% CI [0.28,

0.58]; adjusted OR 0.64, 95% CI[ 0.51, 0.81]).

In preterm infants, the benefits of breastfeeding were not clear when related to

cognitive development and necrotizing enterocolitis (Ip et al., 2009). Little evidence was

found that cognitive development was enhanced by breastfeeding when adjusted for

socioeconomic status, maternal education, and maternal intelligence (Ip et al., 2009).

Positive maternal outcomes related to breastfeeding were also analyzed in the

AHRQ review (Ip et al., 2009). Although mothers who breastfed had a reduced likelihood

of developing breast cancer, more recent research results are inconclusive. The odds of

developing ovarian cancer decreased by 28% if the mother had a cumulative duration of

breastfeeding for at least 12 months (OR adj. 0.72, 95% CI [0.54,0.97]). The AHRQ (Ip

et al., 2009) review also substantiated a small decrease in Type 2 diabetes, as each year a

woman breastfed was associated with a 4% decrease in the risk of developing Type 2

diabetes. Studies that examined the mother's return to prepregnancy weight were

inconclusive as many factors impacted postpartum weight loss. In a later study not included in the AHRQ review, maternal weight loss after pregnancy was enhanced by breastfeeding (Stuebe & Schwarz, 2010). Weight loss in the breastfeeding group was 4.4 pounds more than their non-breastfeeding cohorts when the women continued breastfeeding past 3 months (Stuebe & Schwarz, 2010). Studies that examined the risk of developing osteoporosis due to breastfeeding were also inconclusive. Postpartum depression was associated with a history of very short breastfeeding or not breastfeeding in the AHRQ review (Ip et al., 2009).

Doan, Gardiner, Gay, and Lee (2007) compared the amount of sleep in parents who exclusively breastfed with those who breastfed and supplemented with formula and parents who exclusively fed formula. Parents who exclusively breastfed their infants slept 40 minutes longer (7.2 $\pm$ 1.3 hours) on average than either of the other two groups. The practice of supplementing with formula at night actually resulted in parents getting less sleep in this study. Callahan, Se'journe & Denis (2006), compared postpartum fatigue in women who breastfed with those who bottle fed and found that there were no differences in the mothers' perception of fatigue between the two groups. Mothers who delivered by csection had similar fatigue levels to the mothers who delivered vaginally (Callahan Se´journe´ & Denis, 2006).

**Risks of Formula Feeding**

One study showed health risks increased for both the mother and her infant when the mother did not breastfeed (Stuebe & Schwarz, 2010). Epidemiological data suggested women who did not breastfeed were likely to encounter higher risks of cancer and

cardiovascular disease (Stuebe & Schwarz, 2010). Risks were calculated based on lifetime duration of breastfeeding for all pregnancies rather than the duration of feeding for each pregnancy. The physiology of lactation suggests mothers who are breastfeeding experience lactational amenorrhea due to the suppression of ovulation during lactation. Suppression of ovulation affects the development of breast and ovarian cancers. Thus, each year of breastfeeding was found to be associated with a 4.3% reduction in the risk of invasive breast cancer (Stuebe & Schwarz, 2010). Ovarian cancer rates were also affected. Women who never breastfed faced a 1.3 fold higher risk of ovarian cancer (Stuebe & Schwarz, 2010). Breastfeeding is also associated with higher lipid metabolism, more optimal blood pressure, and better glucose levels. Women who did not breastfeed had higher rates of Type 2 diabetes and cardiovascular disease than did women who breastfed for 7 to 12 months (Stuebe & Schwarz, 2010).

Infants who were not breastfed were found to have higher rates of infection in the first year of life (Stuebe & Schwarz, 2010). Gastrointestinal infections, otitis media, and lower respiratory infections were all higher in the non-breastfed infants. Infants who were not breastfed also had a higher likelihood of dying in the first year of life than did infants who were breastfed (Stuebe & Schwarz, 2010). This may be due to the specific immune factors present in human milk. Immunoglobulin A antibodies are produced in breast milk and provide specific protection against local pathogens (Stuebe & Schwarz, 2010). In addition to infections, asthma, atopic dermatitis, Type I diabetes, and childhood cancers were all higher in infants who were not breastfed (Stuebe & Schwarz, 2010). McNiel, Labbok, and Abrahams (2010) reviewed and reanalyzed breastfeeding studies and results

indicated that when breastfeeding was considered the norm and formula feeding was considered the comparison rather than the standard, "any formula use" was associated with increased incidence of otitis media, asthma, Type 1 diabetes, Type 2 diabetes, atopic dermatitis, and hospitalization for lower respiratory infections. Their work noted formula use was never found to have a protective effect (McNiel et al., 2010). The authors concluded the risk of using formula was too high related to the perception of being easier to use in the early postpartum period.

## Breastfeeding Self-efficacy

Predicting how long mothers will breastfeed has been linked to feelings of self-efficacy. Self-efficacy refers to a person's conviction that he or she will be able to perform certain tasks or behaviors successfully in a given situation. *Outcome expectancy* is the belief that performing a task will lead to a given outcome. This is evident when a mother who has successfully breastfed a previous infant believes she can nurse her baby and this will calm and nourish her infant. The question remains, how do first time mothers develop self-efficacy?

Dennis (1999) believed a mother determines her ability to nurse her infant based on observing others successfully nursing their infants and receiving encouragement from those around her who are significant in her life. The mother also evaluates her physiologic state, which includes pain, anxiety, and fatigue, as an important component of her assessment of her ability to nurse her infant (Dennis, 1999). Keeping the mother calm and comfortable and offering encouragement may help the mother develop confidence when caring for her infant. Breastfeeding self-efficacy develops from four

components: previous breastfeeding experience; vicarious experience; encouragement from others who are meaningful in her life; and physiological responses such as fatigue, stress, anxiety, and pain (Dennis, 1999). Mothers who scored higher on breastfeeding self-efficacy had longer duration of breastfeeding even when their prenatal plans for breastfeeding did not include a longer duration (Dennis, 1999). In the design and testing of the Breastfeeding Self-Efficacy Scale (BFSE), relationships between efficacy enhancing experiences and the Breastfeeding Self-Efficacy Short Form (BFSE-SF) were examined (Dennis & Faux, 1999). Previous successful breastfeeding experiences and professional assistance were found to have no impact on the BFSE-SF scores in the immediate postpartum period except women receiving help from lactation consultants had higher BFSE-SF scores. Experiencing breastfeeding vicariously by watching other women breastfeed also was not a significant predictor of higher scores but watching videos of women breastfeeding resulted in higher self-efficacy scores at 48 hours postpartum but not at 4 weeks postpartum. Verbal persuasion in the form of positive feedback and consistent advice had little impact on self-efficacy scores and praise from others made no significant difference in scores unless the praise was from parents, particularly mothers, and partners, which resulted in significantly higher scores at 48 hours postpartum. Encouragement to continue breastfeeding and to think positively about the experience also had little impact on the BFSE scores.

In the early postpartum period, women who were experiencing pain had lower BFSE scores (Dennis & Faux, 1999). Researchers were unable to demonstrate any relationship between levels of fatigue and BFSE scores (Kingston et al., 2007). Mothers

identified previous breastfeeding experience and the infant latching well as confidence builders in the early postpartum period and infant weight gain at 4 weeks postpartum as enhancing their self-efficacy (Kingston et al., 2007). Self-efficacy in breastfeeding was also supported by Entwistle, Kendall, and Mead (2010) in their qualitative study of low income women and breastfeeding.

## Duration of Breastfeeding

O'Brian, Buikstra, Fallon, and Hegney (2009) identified five psychological factors that lead to a longer duration of breastfeeding: mothering self-confidence, faith in the superiority of breastfeeding, the mother's adaptability, stress levels, and breastfeeding self-efficacy. Others factors impacting the success and duration of breastfeeding were identified by Sullivan, Leathers, and Kelley (2004) as working outside the home fewer than 20 hours a week at 3 months postpartum, paternal support for breastfeeding, and plans made prenatally for breastfeeding. The importance of the couple's relationship, family roles, and the impact of the mother's responsibility for household tasks were significant predictors for early breastfeeding termination (Sullivan et al., 2004). The mother having sole responsibility for the infant's care lowered the risk for early termination of breastfeeding. Spending more time caring for the infant was more consistent with the time and commitment to breastfeeding (Sullivan et al., 2004).

## Impact of Cesarean Section Delivery

The cesarean delivery rate in the United States has now reached its highest point. In 2011 (the last year when statistics were available), the cesarean delivery rate reached 32%, which represents a 70% increase in at least six states from 1996 to 2007 (Menacker

& Hamilton, 2010). Although there are often clear indications for cesarean section, the short- and long-term risks have long been up for debate. Cesarean section involves major abdominal surgery and is associated with the usual surgical and anesthesia complications (Menacker & Hamilton, 2010). Rehospitalization and admission to the NICU for the infant are more common in this population and the cost of hospitalization is almost double that for a vaginal delivery (Menacker & Hamilton, 2010).

Chalmers et al. (2010), in a comparison of cesarean and vaginal birth in Canadian women, found mothers who delivered by cesarean section were much more likely to report they had not held or fed their infants in the first 2 hours after birth and were not breastfeeding in the months following birth. Even in hospitals certified as meeting the standards for "Baby Friendly," breastfeeding support for the cesarean section mother may not be as robust as the support for vaginal delivery mothers. Baby Friendly hospitals follow the 10 steps for successful breastfeeding set out in a joint UNICEF/WHO (n.d.) statement; these hospitals must be inspected and certified as meeting these major initiatives to promote breastfeeding. Rowe-Murray and Fisher (2002) looked at cesarean section in a Baby Friendly hospital and found the time for the first feeding for cesarean section mothers ranged from immediately to 24 hours after birth. The Baby Friendly guidelines specify there should be no more than a 30-minute window from time of birth to the time of the first feeding. In their study, few of the cesarean section mothers met this guideline (Rowe-Murray & Fisher, 2002). Zanardo et al. (2010) also studied the effect of cesarean delivery on exclusive breastfeeding and found mothers who delivered vaginally had longer breastfeeding duration than those who delivered by cesarean section.

Lin, Lee, Yang, and Gau (2011) studied breastfeeding perceptions of mothers who delivered by cesarean section. In their study anesthetic agents were related to the infant's sucking ability, suggesting the infant may be unable to coordinate sucking, swallowing, and breathing to nurse effectively. Mothers using epidural patient controlled analgesics had a higher risk of weaning in the first week postpartum as they were 3.61 times more likely to wean than were mothers who did not use analgesia. Mothers in this study also perceived less milk supply when the initial feeding was delayed due to pain or discomfort. The average time to the first feeding was over 13 hours post-delivery (Lin et al., 2011). Feeding the infant breast milk substitutes also impacted the mother's perception of her milk supply, possibly due to nipple confusion and decreased breast stimulus which aids in milk production (Lin et al., 2011).

Zanardo et al. (2010), in a large study of breastfeeding duration of mothers delivered by caesarean section and those delivered vaginally, found mothers delivered by cesarean section had a longer delay in initiating breastfeeding and much lower duration of breastfeeding up to 6 months. These findings were also replicated by Chien and Tai (2007) who found many women to delay breastfeeding initiation during the hospital stay and women who delivered by cesarean section to be less likely to be breastfeeding at 1 month and 3 months after delivery. Chalmers et al., (2010) found free formula samples were offered more frequently to mothers who delivered by cesarean section and these mothers were less likely to have nursed their babies in the 2 hours following birth, more likely to use pacifiers, and more likely to feed on a set schedule. The women in their

study also had lower rates of breastfeeding in the months following birth (Chalmers et al., 2010).

Women choosing an elective cesarean delivery also had a lower rate of breastfeeding both in the immediate postpartum period and in the weeks following delivery (Zanardo et al., 2010). This low rate of breastfeeding success was serious enough to be called breastfeeding failure in studies reviewed for the Cochrane Collaboration (Lavender, Hofmeyr, Neilson, Kingdon, & Gyte, 2009). Wiklund, Edman, and Andolf (2007), in their study of women who chose elective cesarean delivery, found the breastfeeding rates decreased by 3 months postpartum in the cesarean section mothers. Seventy-nine percent of the elective cesarean women had stopped breastfeeding compared to 93% of the women who planned a vaginal delivery (Wiklund et al., 2007).

Women may feel distressed and traumatized by an unexpected cesarean section, feeling a loss of control, powerlessness, and helplessness that decreases their personal fulfillment and satisfaction with the birth (Wiklund, Edman, Ryding, & Andolf, 2008; Fenwick, Gamble, & Mawson, 2003). This finding was supported by Weiss, Fawcett, and Aber (2009) who found an unplanned caesarean birth for the first time mother may impact the woman's sense of self and increase her need for emotional and social support. The unplanned cesarean section places the first time mother at risk for a negative reaction to the birth and a more difficult transition to motherhood. Women may feel as though being unable to deliver vaginally as they planned impacts their role as women and leaves them with a feeling of disempowerment that may impact their self-efficacy (Fenwick et al., 2003). In a review and analysis of the literature, Lobel and DeLuca (2007) evaluated

studies of the psychosocial sequelae of cesarean birth and concluded mothers who

delivered by cesarean section may experience distress and dissatisfaction and their infants

may receive less positive responses and interaction with their mothers. This study also

found a decrease in breastfeeding initiation and duration (Lobel & Deluca, 2007). In two

later qualitative studies, several themes were identified by the women who had an

emergency caesarean birth, including loss of control, fright, disappointment, and disbelief

(Fries, 2010; Somera, Feeley, & Ciofani, 2010). These feelings could interfere with

breastfeeding initiation and self-efficacy.

   Postoperative pain is a factor for women experiencing cesarean birth. In a study of

60 new mothers the women reported high levels of pain in the first 24 hours after birth,

and one third of these mothers felt their ability to breastfeed was affected negatively to a

large or very large extent (Karlström, Engström-Olofsson, Norbergh, Sjöling, &

Hildingsson, 2007).

   More recently, data from the Ontario Mother and Infant Study (TOMAS) III

(Watt et al., 2012) were released indicating unplanned cesarean or instrument delivery

was associated at a significant level with an increased likelihood of initiating

breastfeeding (OR 1.5612, 95% CI [1.1894, 2.0492], $p$ = .0013; Watt et al., 2012). These

women were more likely to be continuing breastfeeding up to 6 weeks postpartum (OR =

1.2217, 95% CI [1.0577, 1.4112], $p$ = .0065; Watt et al., 2012). Another interesting

finding in this study was hospital length of stay was longer for mothers who had an

unplanned cesarean or instrument delivery. The length of hospitalization was greater for

those who delivered by cesarean section, as 69% stayed in the hospital longer than 48

hours following birth in contrast to women who delivered as planned, and of these most (62%) stayed less than 48 hours following birth (Watt et al., 2012). A longer hospitalization allows more time for supportive interaction with lactation consultants and postpartum nurses, which has been found to enhance breastfeeding success and duration (Teich, Barnett, & Bonuck, 2014).

## Maternity Practices in Infant Nutrition and Care (mPINC)

Every 2 years starting in 2007, the CDC conducts a federally sponsored national survey of maternity care feeding practices and policies in facilities that routinely provide maternity care. The mPINC study is grounded in the literature to reflect practices known to enhance successful breastfeeding. There are 52 questions on the survey and scores range from zero to 100 with higher scores indicating better maternity practices (Edwards & Philipp, 2010). The survey includes questions related to practices known to affect the initiation and duration of breastfeeding in the hospital or birth center, training of personnel, and other characteristics of the hospital or birth center. Eighty-two percent of maternity facilities submitted data for the report in 2007. The results indicated many facilities used practices known to interfere with breastfeeding (Edwards & Philipp, 2010), such as delays or omissions in the use of skin-to-skin contact within the first 1 to 2 hours after birth, delaying the first breastfeeding longer than 1 to 2 hours after birth, separation of mother and baby instead of rooming-in as many hours as possible in the postpartum period, and supplementing without a medical indication (Menacker & Hamilton, 2010).

In 2011, the mPINC survey was repeated and the state of Virginia earned a composite score of 67 out of 100 and a ranking of 31 out of 53 states in the United States

and the District of Columbia (CDC, 2013). According to the survey, 75.9% of mothers initiate breastfeeding but only 48.2% of infants are still breastfeeding at 6 months. Exclusive breastfeeding rates are lower in Virginia as only 34% are exclusively breastfeeding at 3 months and only 15.8% are still exclusively breastfeeding at 6 months. This falls far short of the Healthy People goals for 2010 of 82% initiating breastfeeding, 46% breastfeeding exclusively at 3 months postpartum, and 25% breastfeeding exclusively at 6 months postpartum (CDC, 2013).

The 2011 mPINC survey demonstrated only 51% of Virginia facilities placed infants born vaginally skin-to-skin with their mothers for 30 minutes within the first hour following birth; with cesarean section birth the skin-to-skin rate was only 26% (CDC, 2013). The time to first feeding for vaginal births within the first hour was met for 48% of mothers delivering vaginally, but for cesarean sections only 39% of mothers accomplished the initial feeding within the first 2 hours (CDC, 2013). Only 32% of Virginia facilities follow the CDC guidelines regarding supplementing infants with non breast milk supplements (CDC, 2013). Supplementing is a practice well known to diminish breastfeeding success. Rooming-in with the infant for 23 out of every 24 hours was also a rare practice in the Virginia population (CDC, 2013).

Only 11% of facilities in Virginia have a comprehensive policy that includes the components of a model breastfeeding policy recommended by the Academy of Breastfeeding Medicine (CDC, 2013).

**Placing Infants Skin to Skin With Their Mothers**

Skin-to-skin contact of the infant with its mother is an easy but important factor in breastfeeding. Currently, only 51% of Virginia hospitals follow this practice (CDC, 2013).

Term infants have been found to be more likely to be breastfeeding 1 to 4 months postpartum and to nurse an average of 42.55 days longer than breastfeeding infants not placed skin-to-skin within 2 hours after birth (Moore, Anderson, & Bergman, 2007). Infants placed skin-to-skin often breastfeed more successfully than do those who are swaddled in blankets and placed at the breast (Moore et al., 2007). Late preterm infants benefit as well with increased cardiorespiratory stability, thermal stability, and blood glucose levels (Moore et al., 2007). Another finding from this Cochrane Review was a decrease in crying by infants placed skin-to-skin. Many parents find crying to be particularly worrisome. There are also physiological sequelas, as crying reestablishes portions of fetal circulation and may result in delayed closure of the foramen ovale, even increasing the incidence of intraventricular hemorrhage in preterm infants which may inhibit breastfeeding (Moore et al., 2007). Longer periods of skin-to-skin contact with the infant enhance breastfeeding exclusivity during the hospital stay. Infants in a study by Bramson et al. (2010) who were placed skin-to-skin for various lengths of time immediately after birth demonstrated a dose-response relationship. Skin-to-skin contact with the infant for more than 1 hour within the first 3 hours following birth was more likely to result in exclusive breastfeeding (OR 3.145; 95% CI, 2.905-3.405; Bramson et al., 2010). Infants delivered by cesarean who were placed skin-to-skin with their mothers

breastfed earlier and had increased duration of breastfeeding in a 2010 experimental study (Gouchon et al., 2010). Thermal regulation and exclusive breastfeeding at hospital discharge were enhanced by skin-to-skin contact in a randomized controlled study of 430 healthy mothers and infants over a 4-month period in Madrid (Marin et al., 2010). In a 2010 observational study following elective cesarean delivery, there was less crying and an earlier shift to a relaxed state in infants kept skin-to-skin for an extended time, which would enhance breastfeeding (Velandia, Matthisen, Uvnäs-Moberg, & Nissen, 2010).

**Rooming-in With the Infant**

Rooming-in with the infant after birth is the practice of keeping mother and infant together in the same room for 24 hours a day (UNICEF/WHO, n.d.). This practice has been identified as one of the 10 steps to successful breastfeeding. This is a hospital practice that influences breastfeeding success and duration. DiGirolamo, Grummer-Strawn, and Fein (2008) demonstrated women who did not room-in with their infants were at a higher risk of terminating breastfeeding before 6 weeks postpartum (OR 1.1, CI 0.8, 1.5). This was also demonstrated in a later study of hospital practices and breastfeeding duration by Murray, Ricketts, and Dellaport (2007). Rooming-in was identified as one of five practices that increased the duration of breastfeeding. Two thirds of the 4,544 mothers (68%; 95% CI 61-75) who experienced all five successful practices, including rooming-in with their infants, were still breastfeeding at 16 weeks postpartum. Zuppa et al. (2009) demonstrated that 81% of infants who fully roomed-in with their mothers exclusively breastfed while infants who partially roomed-in had only 42.9% exclusive breastfeeding.

**Supplemental Formula Feedings**

Supplementing breastfeeding with formula is a common hospital practice in the first 24 to 48 hours of life. Low blood glucose levels shortly after birth may require formula feeding to correct. Often the infant's behavior that seems restless, irritable, and difficult to settle is interpreted by caregivers and parents as hungry. Bunik et al. (2010), in their study of the influence of formula and support, found mothers who reported zero to two formula feeds per day were more likely to be breastfeeding at 1 month compared to mothers who reported three or more supplemental feedings per day (OR, 7.7 95% CI 2.4-24.3). Murray et al. (2007) reported increased duration of breastfeeding by mothers who did not supplement with formula during the immediate postpartum period, as 81% of these mothers were still breastfeeding at 8 weeks postpartum. Supplementation with formula also impacted breastfeeding success in a retrospective cohort study of infant-feeding practices; there was a negative association between formula supplementation and breastfeeding at 6 months of age (OR, 0.27; 95% CI, 0.13-0.56). Biro, Sutherland, Yelland, Hardy, and Brown (2011), in a large multisite study of 4,085 women who initiated breastfeeding after birth, found 23% reported their infants received formula supplementation by the nursing staff. In this study, supplementation was more likely if it was a first baby, if the mother was non-English speaking, had a body mass index over 30 (adj. OR = 2.27; 95% CI: 1.76-2.95), had an emergency cesarean section (adj. OR = 1.72; 95% CI: 1.3-2.28), if the baby was admitted to a special care nursery, the infant's birth weight was less than 2,500 grams, or the infant was born in a hospital that was not an accredited Baby Friendly hospital (Biro et al., 2011). In a study conducted in

Washington, DC, low income women reported 78% of their infants received supplemental formula during the postpartum hospitalization by the staff for non-medical reasons (Tender et al., 2008). Semenic, Loiselle, and Gottlieb (2008) studied predictors of duration of exclusive breastfeeding in first time mothers and found decreased BFSE scores for mothers who were supplementing with formula and that in-hospital supplementation, by the nursing staff or the mothers, was associated with the perception of more breastfeeding problems ($r = .31$) and lower breastfeeding self-efficacy both in the hospital and at 6 weeks postpartum ($r = -.25$).

**Time from Birth to First Breastfeeding**

The World Health Organization and UNICEF recommend initiating breastfeeding within 1 hour of birth along with exclusive breastfeeding for the first 6 months of life (UNICEF/WHO, n.d.). Although the national average for initiating breastfeeding within 1 hour of birth in 2009 was 50.9%, only 25% of the infants delivered by cesarean section received breast milk for their first feeding (CDC, 2011). Nakao, Moji, Honda, and Oishi (2008) demonstrated the time of first feeding within 60 minutes was significant in the number of mothers who were fully breastfeeding at 4 months of life compared with those who initiated breastfeeding after 2 hours (OR 2.5, $p = 0.01$). Chien and Tai (2007) found women who initiated breastfeeding within 30 minutes of birth had higher odds of breastfeeding at 1 and 3 months after birth (OR 1.47). Soltani and Arden (2009) supported this finding in their study of diabetic mothers. Breastfeeding at the first feeding was predictive of continuing to breastfeed up to 6 weeks postpartum.

**Social Support**

The degree of social support is often mentioned in breastfeeding studies. The importance of a supportive environment and how to create support have been the subjects of studies looking at peer counselors and others in the woman's social strata who are supportive of breastfeeding. A supportive husband who views breastfeeding as a normal event is a valued support (Entwistle et al., 2010). The women interviewed in the Entwistle et al. (2010) study fell into two groups: those who grew up in a breastfeeding family and had husbands who were breastfed saw breastfeeding as a normal process and called on their mothers for support, while the second group did not have husbands who were breastfed and identified their husband or the baby's father as instrumental in their decision to give up breastfeeding. Watching another woman breastfeed is also a way of developing self-efficacy. In a study of low income women in Alabama, mothers who had never seen anyone breastfeed rarely initiated breastfeeding and often stopped breastfeeding after a week (Meyerink & Marquis, 2002). Only 15% of the 150 women in that study had been breastfed themselves (Meyerink & Marquis, 2002). To encourage families to support the mother, lactation counseling support workers and maternity care assistants were used to educate not only the mother but her husband and family. This intervention resulted in higher breastfeeding initiation rates and longer duration of breastfeeding (Erkul, Yalcin, & Kilic, 2010; Ingram & Johnson, 2009).

**Other Variables**

As maternal age increases breastfeeding rates also increase; mothers over the age of 35 were found to be more likely to initiate breastfeeding (OR = 1.19) compared to

mothers between the ages of 20 and 34 (Sparks, 2011). Maternal education also impacts

breastfeeding, as mothers who are more highly educated choose to breastfeed more often

(CDC, 2011; Sparks, 2011). Mothers more frequently breastfeed if they have higher

incomes. Rural foreign born Mexican women have much higher odds of initiating

breastfeeding (6.65) than do urban Mexican women (Sparks, 2011). Mothers in general

who live in a rural setting have 57% higher odds of initiating breastfeeding compared to

urban mothers living in poverty (Sparks, 2011).

The highest rates of breastfeeding by ethnic group are foreign born Hispanic (OR

= 1.72) and Asian mothers (OR = 1.44) followed by White women and U.S. born

Hispanic women (OR = 0.76) and non-Hispanic Black women (OR = 0.42; CDC Infant

Feeding Practices Study II, 2011; Sparks, 2011). In a study using the Pregnancy Risk

Assessment and Monitoring System (PRAMS) data, Ahluwalia, Morrow, D'Angelo, and

Li (2011) found the overall pattern of breastfeeding varied substantially between ethnic

groups. In their study of 49,135 women, 50.2% (95% CI: 49.5-50.9) breastfed for 10

weeks or more, 27.7% (95% CI: 27.1-28.4) breastfed for less than 10 weeks, and 22.1%

(95% CI: 21.5-22.60) of the overall sample did not breastfeed (Ahluwalia et al., 2011). In

the group of Black mothers, 35.2% (95% CI: 33.5-36.9) breastfed for more than 10

weeks, 29.6% (95% CI: 27.4-30.6) breastfed for less than 10 weeks, and 35.8% (95% CI:

34.2-37.5) did not breastfeed at all (Ahluwalia et al., 2011). In contrast, for the sample of

White mothers, 51.5% (95% CI: 50.5-52.4) breastfed for more than 10 weeks, 25.6%

(95% CI: 24.8-26.5) breastfed for less than 10 weeks, and 22.9% (95% CI: 22.1-23.7) did

not breastfeed at all (Ahluwalia et al., 2011). Among the group of Hispanic mothers,

53.5% (95% CI: 52.0-54.9) breastfed for more than 10 weeks, 32.6% (95% CI: 31.2-34.0)

breastfed for less than 10 weeks, and only 14% (95% CI: 12.9-15.0) did not breastfeed

(Ahluwalia et al., 2011).

Robinson and VandeVusse (2011) explored African American women's feeding

choices and breastfeeding self-efficacy. In their study women shared a common rationale

for choosing their particular feeding method: accomplishment (either positive or negative

experiences), vicarious experiences (role models), verbal persuasion, and support. An

additional theme the women identified was a physiological reaction to breastfeeding,

feeling it was painful and uncomfortable but became enjoyable as they mastered

breastfeeding. This theme seemed to be the factor that led to choosing formula for the

mothers who could not get past the discomfort and demands of breastfeeding. Two other

themes emerged in this group: social embarrassment when feeding or anticipating

exposing themselves in public, and feelings of regret by the mothers choosing to use

formula (Robinson & VandeVusse, 2011). Data gathered from the National

Immunization Survey, an ongoing random telephone survey conducted quarterly in the 50

states and the District of Columbia by the National Center for Immunizations and

Respiratory Diseases, the National Center for Health Statistics, and the Centers for

Disease Control and Prevention, indicate that between 2001 and 2008 significant

increases in breastfeeding initiation and duration occurred in all ethnic groups (Allen et

al., 2013). The gap in breastfeeding initiation between White and Black infants narrowed

from 24.4 percentage points in 2000 to 16.3 percentage points in 2008 but remains

consistently lower for Black mothers (Allen et al., 2013).

**Summary**

There is sufficient evidence that breastfeeding is a public health issue. Breastfeeding decreases sudden SIDS, diabetes, two types of childhood leukemia, gastrointestinal infections, and otitis media. There is a need to look for ways to help mothers become successful at breastfeeding their infants. Advantages for the mothers include decreased risk of breast cancer, decreased risk of ovarian cancer, a decrease in Type 2 diabetes, and enhanced weight loss in the postpartum period. The American Academy of Pediatrics (2012) recently updated its policy statement, "Breastfeeding and the Use of Human Milk," to use sterner language that breastfeeding exclusively for the first 6 months of life is an essential public health issue. Further, the American Academy of Pediatrics recommends infants continue to be breastfed for the first year of life, even as they are introduced to solid foods. Quality evidence exists to suggest breastfeeding enhances parental sleep during the first year of life and that the whole family benefits from breastfeeding behaviors.

As the number of cesarean section deliveries increases, another obstacle to successful breastfeeding occurs as the mother experiences discomfort in moving around and caring for her infant, which may delay the initiation of breastfeeding and impact the overall success of breastfeeding. In the first 2 hours after a cesarean section mothers are often in a post-anesthesia care unit that is better equipped to maintain their respiratory ability than to support early breastfeeding efforts. The amount and types of medications that decrease intraoperative and postoperative pain and increase muscle relaxation may also impact early breastfeeding efforts.

Early breastfeeding practices identified by the CDC may be delayed in the early postoperative period and the mother may not see or hold her infant until much later when the infant has passed through the early alert phase and is well into deep sleep phase, delaying breastfeeding initiation. This study seeks to examine the impact of primary cesarean section on the implementation of the recommendations from the CDC in an attempt to identify areas that will help nursing enhance postpartum care of the mother and infant to support breast feeding.

# CHAPTER THREE: METHODOLOGY

## Research Design

A prospective non-experimental design (Polit & Beck, 2008) was used to explore breastfeeding self-efficacy scores and breastfeeding outcomes between mothers delivering vaginally and those with an unplanned cesarean section. Moderator variables selected from the 2009 mPINC survey were combined with mode of delivery to predict breastfeeding self-efficacy and breastfeeding outcomes. The moderator variables were: (a) time to first feeding, (b) supplemental feedings, (c) rooming-in with the infant, and (d) skin-to-skin contact. Breastfeeding outcomes were defined following Labbok and Krasovec's (1990) schema for consistency in breastfeeding definitions. This schema divides breastfeeding into three categories. Full breastfeeding includes exclusive feeding, when no other liquid or solid is given to the infant, and almost exclusive, which includes vitamins, minerals, water, juice, or ritualistic feeds given infrequently in addition to breast milk. Partial breastfeeding includes high, when more than 80% of feeding is breast milk; medium, when 20% to 80% of feeding is breast milk; and low, when less than 20% of feeding is breast milk. The third category is token breastfeeding, which occurs when minimal breast milk is given occasionally or irregularly (Labbok & Krasovec, 1990).

## Sample Size

Sample size was computed using Cohen's (1987) formula. Cohen defined a small effect as an $R^2$ of 0.02, a moderate effect as an $R^2$ of 0.13, and a large effect as an $R^2$ of 0.30. The formula is $N = $ L $(1-R^2)$ divided by $R^2$, + u +1, where $N = $ total sample size, L = effect size, and u = the number of independent variables (Munro, 2005):

$$N = \frac{12.8\ (1\text{-}0.13)}{0.13} +5 +1 = 92$$

A convenience sample of mothers experiencing vaginal births and cesarean section births was recruited. Attrition occurred through two sources: mothers who quit breastfeeding and mothers who were lost to follow-up. Most breastfeeding studies lose 10% to 25% of the participants due to stopping breastfeeding or lost to follow-up (Brand, Kothari, & Stark, 2011; Dennis, 2003; Semenic et al., 2008). Therefore, a sample of 124 vaginal deliveries and 125 cesarean section mothers was recruited for this study.

## Research Setting

A large East Coast hospital was selected because it had approximately 10,000 births each year and a cesarean section rate of 48%. There is an active Maternal Fetal Medicine referral center and a number of high risk deliveries each year; however, many low risk women also choose this facility for childbirth. Approximately 30% of the mothers are first time mothers and the average postpartum hospital stay is 24 to 48 hours for uncomplicated vaginal birth and 48 to 72 hours for cesarean birth. Lactation consultants are available daily and visit each breastfeeding mother on the second postpartum day. Mothers are invited to return to the hospital for a complementary lactation consultation and breastfeeding support group that is held weekly and are given

information to call the Lactation Center for questions at any time. The hospital Lactation Center rents breast pumps and can arrange home visits and on-site consultation through Health Source, a health system patient education service. Health Source also provides prenatal breastfeeding classes for a nominal fee. Some health insurance pays for breast pumps as does Medicaid; WIC support for breastfeeding is substantial.

This large hospital is located in Northern Virginia. Northern Virginia is a large region with approximately 2.6 million residents (Cooper Center, 2013). The ethnic and racial population of this area is predominantly White at 55.41%, Hispanic at 16.30%, Black at 11.28%, Asian at 10.46%, and others (Cooper Center, 2013). Household income is high with the majority of residents earning over $100,000 a year. In Northern Virginia only 8.2% of residents fall below the federal poverty rate (Fairfax County Gov, 2013). Education levels also exceed most other areas with well over half of the residents holding a bachelor's degree or higher (Cooper Center, 2013).

## Sample and Sampling Plan

The target population for this study was women who: (a) were breastfeeding or attempting to breastfeed, (b) who had given birth (by cesarean section or vaginally) within the previous 24 to 48 hours, (c) had no preexisting medical complications, (d) ranged in age between 18 and 40 years, and (e) were first time mothers. First time mothers were recruited for the study to eliminate the impact of previous infant feeding experience.

**Maternal Exclusion Criteria**

Exclusion criteria for mothers included: (a) the presence of prenatal or perinatal complications that could interfere with the mother's ability to interact with her infant in the first 2 hours following birth, (b) initial intent to bottle feed her infant, and (c) women having an elective cesarean section birth because the psychology surrounding elective cesarean section is not well understood and may impact breastfeeding self-efficacy.

**Infant Exclusion Criteria**

Exclusion criteria for infants included: (a) less than 37 weeks gestation; (b) admitted to a neonatal intensive care unit; (c) weighing less than 5 pounds, as infants less than 5 pounds (2,268 grams) are more likely to have difficulty with breastfeeding; (d) infants with a 5 minute Apgar less than seven; or (e) the presence of complications at birth that would impede skin-to-skin contact or breastfeeding.

<div align="center">

**Data Collection**

</div>

First time mothers meeting the study criteria were contacted using a standard script (Appendix 1). If they were interested in participating in the study the researcher gave them a verbal explanation of the study (Appendix 2), questions were answered, and a signed informed consent (Appendix 3) approved by the IRB was obtained. Following consent the participants were asked to complete a personal data form and the BFSE scale (Appendix 4), which included information about delivery, skin-to-skin contact, and feedings, as well as education and income and a variety of other data. Each participant was assigned a number code that was placed on the consent form, the demographic and data form, and the BFSE survey as well as mailed questionnaires. Mailing addresses were

obtained to send subsequent questionnaires to each participant at 10 days and 8 weeks postpartum. Each participant was given a written flyer with the researcher's name, contact information, e-mail, and personal thanks when she had completed the initial survey (Appendix 5). Participants were asked to complete the BFSE scale at three points: time one data point was 24 to 48 hours post-delivery, time 2 data point was 10 days following delivery, and time three data point was 8 weeks following delivery. The additional data point of 10 days postpartum was added based on the advice of an expert lactation consultant (V. Hughes, personal communication, March 17, 2012). Continued breastfeeding duration and outcomes were also determined at each data point. The 10 day surveys (Appendix 6) were mailed to the participants at 7 days postpartum. Each participant received the printed survey and a stamped addressed envelope to return the survey to the researcher at 10 days postpartum. A short flyer was included thanking the participant for filling out the form and reminding her that another survey would come at about 8 weeks postpartum (Appendix 7). At 7 weeks postpartum the 8 week survey was mailed to the participants (Appendix 5). Each participant received a printed survey and a stamped addressed envelope to return the survey to the researcher at 8 weeks postpartum. Another short flyer was included thanking the mother for her participation (Appendix 8).

## Protection of Subjects

The consent forms that contained the mothers' names, addresses, and number codes were locked in a file within a locked office to assure confidentiality following the hospital's HSR recommendations. Any woman who decided to withdraw from the study was free to do so at any time. Women were given the researcher's name, address,

telephone number, and e-mail so they could contact the researcher if any questions arose

or they chose to withdraw from the study after hospital discharge. Approval for the study

was obtained through George Mason University (Appendix11) and the hospital IRB,

Appendix (12), An extension of the project was also obtained from the hospital IRB to

allow time for data analysis (Appendix 13).

## Instrumentation

The Breastfeeding Self-Efficacy Scale-Short Form (BFSE-SF) (Dennis & Faux,

1999) is a 14-item questionnaire consisting of positive statements to which participants

rate their agreement on a Likert scale. A response of 1 indicates the mother is not at all

confident and a response of 5 indicates the mother is strongly in agreement. Reliability of

the instrument has been reported with a Cronbach's alpha of .94 and a scale mean of

55.88 ($SD = 10.85$). The item means were 3.99 with a range from 3.71 to 4.13, and a

variance of 1.04 with a range from 0.75 to 1.56. The mean inter-item correlation was 0.55

with a range from 0.41 to 0.73. The BSES-SF scores correlated significantly with the

original BSES scores at 1 week ($r = 0.99$), 4 weeks ($r = 0.99$), and 8 weeks ($r = 0.99$)

postpartum. Construct validity is demonstrated by significant correlations between the

BFSE-SF and several other scales. The Rosenberg Self-Esteem Scale, the Perceived

Stress Scale, and the Edinburgh Postnatal Depression scale demonstrated significant

correlation of $p < .001$ (Pollard & Guill, 2009). Predictive validity of the BSES-SF is

demonstrated by significantly different scores on the scale from mothers exclusively

breastfeeding and those who are partially breastfeeding or bottle feeding (Dennis, 2003).

Permission to use the tool was obtained by personal communication and e-mail with the owner (Appendix 9).

## Data Collection

Data were collected from first time mothers in the immediate postpartum period 24 to 48 hours after giving birth. The nurse manager of the postpartum unit used the electronic medical record to identify all of the first time mothers on the unit and their delivery method. The nurse caring for the postpartum mother or the nurse manager used a standard script to ask the mothers whether they were willing to speak with the researcher. The researcher visited interested mothers in their hospital rooms to explain the research project and obtain their informed consent. Postpartum mothers' questions were answered; the initial data, including the demographic data sheet and the initial survey, were collected; and addresses and phone numbers were obtained for follow-up data collection. Many of the mothers were interviewed with their partners and infants in the room and some had grandparents and friends with them as well. Most of the mothers were holding their infants at the time of data collection. They handed the baby off to someone else in the room or to the researcher, or the researcher filled out the questionnaire with input from the mother. Often the partner (infant's father) filled out the questionnaire in the presence of the researcher, asking the mother for input. The mothers identified as delivering by cesarean section frequently had difficulty remembering when they first nursed the infant. Most remembered being skin-to-skin in the postoperative care unit (PACU), and their partners filled in more of the information as to how much time elapsed between delivery and nursing the infant for the first time. Very few mothers expressed

feeling pain or sedation at the time of the first data collection. A few mothers expressed disappointment with the delivery method. If a mother expressed disappointment with delivery, the researcher reassured her and redirected her toward her achievement of having a healthy baby. The researcher also answered any questions about breastfeeding and postpartum recovery that the woman or her partner or family asked at that time.

The 10 day surveys were mailed to the participants at 7 days postpartum. Each participant received the printed survey and a stamped addressed envelope to return the survey to the researcher at 10 days postpartum. A short flyer was included thanking the participant for filling out the form (Appendix 7), and reminding her that another survey would come at about 8 weeks postpartum. At 7 weeks postpartum the 8 week survey was mailed to the participants. Each participant received a printed survey and a stamped addressed envelope to return the survey to the researcher at 8 weeks postpartum. Another short flyer was included thanking the mother for her participation (Appendix 8).

There was limited contact between the researcher and the participants after the initial contact. None of the participants expressed discomfort with the survey and none withdrew from the study.

### Data Analysis

Data were entered into SPSS 22 for initial analysis and cleaning. All data were checked for accuracy and any outliers were compared to the raw data. SPSS 22 was used to examine the data for descriptive statistics, including mean, standard deviation, frequencies, and range. Scatter plots were constructed to determine normal distribution, homoscedasticity, and linearity of relationships between the independent variables and

the dependent variable (Appendix 10). Multiple regression analysis, ANOVA, ANCOVA, and chi-square were used to answer the research questions and test the hypotheses.

**Research Question 1**

Does type of delivery, skin-to-skin contact, time of first feeding, number of supplemental feedings, and hours rooming-in with the infant predict breastfeeding self-efficacy for first time mothers at 24 to 48 hours, 10 days, and 8 weeks postpartum?

$H1_a$: Type of delivery, skin-to-skin contact time of first feeding, formula supplementation and rooming-in with the infant predict breastfeeding self-efficacy for first time mothers at 24 to 48 hours, 10 days and 8 weeks postpartum.

Multiple regression analysis with entering method for each data point was used as the statistical measurement.

At the time three data point, 8 weeks postpartum, the 24 to 48 hour self-efficacy score was added as an independent variable.

**Research Question 2**

Do first time mothers who deliver by unplanned cesarean section and those who deliver vaginally have different breastfeeding self-efficacy at 10 days postpartum when both have experienced skin-to-skin contact within the 1 to 2 hours after birth, the first breastfeeding within the first to 2 hours, rooming-in with the infant, and limited supplemental feedings?

$H2_a$: Mothers who deliver by unplanned cesarean section have significantly different breastfeeding self-efficacy at 24 to 48 hours postpartum, 10 days postpartum,

and 8 weeks postpartum from those who deliver vaginally when receiving similar breastfeeding support.

One-way ANOVA was used as the statistical measurement. The mean BFSE-SF score between women who delivered by unplanned cesarean section and those who delivered vaginally was compared at each data point to determine whether there was a significant difference in self-efficacy by delivery type.

**Research Question 3**

What combination of mPINC variables and delivery mode best predicts breastfeeding outcomes (defined as full, partial, token, and none) among first time mothers at 10 days and 8 weeks postpartum?

$H3_a$: Mothers who deliver by unplanned cesarean section have significantly different breastfeeding outcomes at 10 days and 8 weeks postpartum.

Multiple regression was used as the statistical measurement.

**Research Question 4**

Is there a difference in breastfeeding outcome between first time mothers delivering vaginally and those delivering by cesarean section when adjusted for breastfeeding self-efficacy at 10 days postpartum?

$H4_a$: Mothers who deliver by cesarean section will have significantly different breastfeeding outcomes at 10 days postpartum when adjusted for breastfeeding self-efficacy scores.

ANCOVA was used as the statistical measurement.

**Research Question 5**

Is there a relationship between mode of delivery and breastfeeding outcomes at 10 days and 8 weeks postpartum?

H5$_a$: There will be a difference between breastfeeding outcomes in mothers who deliver by cesarean section with those who deliver vaginally.

Chi-square was used as the statistical measurement.

# CHAPTER FOUR: DATA ANALYSIS

The purpose of this study was to evaluate the impact of unplanned cesarean section on breastfeeding self-efficacy and breastfeeding outcomes for first time mothers who experienced breastfeeding support similar to that given to mothers who deliver vaginally.

With cesarean section rates reported by the CDC (2011) to be at an all-time high, when the study was initiated, there is concern that mothers experiencing an unplanned cesarean section will have less successful breastfeeding outcomes without additional support from their postpartum nurses, physicians, and lactation consultants.

The results of this prospective non-experimental study are presented in five sections. The first section provides information about the sample demographics. The second section provides details about their breastfeeding experience. The third section provides information about the mPINC variables. Section four provides detail about the study instrument. Section five details the statistical analysis of the five research hypotheses.

Data were entered into SPSS Version 22 for analysis and were screened for accurate entry at all data points: initial data collection, 10 days postpartum, and 8 weeks postpartum. All of the data were examined for descriptive statistics of the sample, including mean, standard deviation, frequency, and range.

Analysis of the sample was restricted due to study attrition. Although there was very little missing data at the initial sample at 24 to 48 hours postpartum, a large number (near 50%) of the surveys were not returned at 10 days and 8 weeks postpartum, which yielded only 93 cases with complete data.

Missing values were not replaced with the mean as it is not recommended when the missing value is over 15% (Mertler & Vannatta, 2004). Statistical calculations were performed for the 93 complete data sets available using SPSS Version 22. For descriptive purposes the initial data obtained at 24 to 48 hours postpartum are presented as they were rich in descriptive characteristics of the study population.

**Sample Demographics**

When comparing delivery methods the study participants were almost equally divided by delivery type, with 124 respondents reporting vaginal births (49.6%) and 126 reporting cesarean section births (50.4%).

When comparing the current sample to Fairfax County population, ethnic composition was slightly different. A total of 51.6% of the study participants identified themselves as White, slightly lower than the population of Fairfax County (67.7%). Only 2.1% of the participants identified themselves as Black while the population of Fairfax County is made up of 9.7% Black Americans. Although some of the Hispanic/Latino mothers did not speak English and were unable to participate in the study, 12.8% of the mothers in the study self-identified as Hispanic/Latino. Asian mothers could select from Asian-Korean, Asian-Chinese, Asian-Vietnamese, or Asian-Japanese. Most Asian mothers were Asian-Chinese (12, 4.8%), followed by Asian-Korean (11, 4.4%), Asian-

Vietnamese (7, 2.8%), and Asian-Japanese (2, 0.8%). Four mothers identified themselves

as Middle Eastern and 29 selected other ethnic group. From the group of 250 women, 15

preferred not to disclose their income or did not know what their income was in the past

year. Approximately 6% were below the federal poverty level for 2012. Sixteen women

stated their income was less than $25,000 for the past year. Depending on the number of

people in their family it was possible they fell below the federal poverty level. Most of

the women (48.4%) reported an annual income of $100,000 a year or higher; 56 women

reported an income of $50,000 to $100,000; the mean income for this group was

$69,783.54; and the median income in this study was $100,000. This was higher than the

median income in the state of Virginia of $63,302 and higher than the median income in

the United States of $52,762 per year. Table 2 presents a comparison of selected

demographics between the study sample, Fairfax County, Virginia, and the United States.

Table 2

*Demographic Characteristics: Comparison Between Study Participants, Fairfax County,*

*Population of Virginia, and the United States*

| Demographic | Study Participants Vaginal Birth | Study Participants Cesarean Birth | Fairfax County | Virginia | United States |
|---|---|---|---|---|---|
| Median Income | $50,000 | $100,000 | $108,439 | $63,302 | $52,762 |
| Poverty Level | 8.9%* | 4.0%* | 5.5% | 10.6% | 14.3% |
| White | 45.2% | 57.9% | 67.7% | 71.9% | 77.9% |
| Black | 5.6% | 11.1% | 9.7% | 13.1% | 13.1% |

Table 2 (continued)

| Demographic | Study Participants Vaginal Birth | Study Participants Cesarean Birth | Fairfax County | Virginia | United States |
|---|---|---|---|---|---|
| Asian | 17.8% | 8.0% | 18.4% | 6.0% | 5.1% |
| Hispanic | 14.5% | 11.1% | 16.1% | 8.4% | 16.9% |

*Note.* *N*=250. *Unclear whether they met the requirements. *Source*: U.S. Census Bureau (2014).

The primary language spoken by the mothers was English at 77.9% followed by Spanish at 7.2% with 14.9% choosing "other." All of the mothers communicated in English with the researcher, but some were observed speaking other languages with the family and friends in their rooms.

Employment status among participants also varied from working for pay, looking for work, not working, and not looking for work. Most women reported being employed (74.8%) with 6.45% actively seeking employment and 18.4% not being employed or planning to work. When inquiring about living arrangements, most mothers reported living with their spouse or a partner (83.9%). Twenty-five mothers (10%) reported living with parents or other relatives and three (2%) reported living alone. Thirty percent of the women were recipients of the Women Infant and Children (WIC) program, a supplemental nutrition program for low income women with dependent children that provides grants for food, health care referrals, and nutrition education for pregnant and breastfeeding mothers. Eligibility for WIC also includes women who are not breastfeeding during their recovery from childbirth or have children up to age 5 who meet

criteria for nutritional risk. Mothers can receive more food subsidies from

WIC if they are breastfeeding.

The mothers ranged in age from 18 to 40 years. The mean age was 29.75 years

and the median age was 30 years. Mothers self-reported their weight prior to pregnancy

as ranging from 77 pounds to 260 pounds with a mean weight of 149.15 pounds. Infant

birth weight ranged from 2,268 grams to 4,649 grams with a mean of 3,319.84 grams.

These variables were normally distributed.

Educational levels varied among the women and only a small percentage (2.8%)

reported an eighth grade education level while one third of the sample (32%) completed a

master's degree or higher. The mean education level for the sample indicated some

college ($M = 15.81$, $SD = 2.22$ ), with 106 of the mothers reporting having completed a

bachelor's degree. One option that was not initially accounted for in the survey was how

to report education level when the education was obtained internationally.

Some of the women stated they were students working part-time and going to

school; although their income was low their parents were paying for some, if not all, of

their living expenses or they had scholarships or grants that helped pay their living

expenses. One woman self-identified as living in a homeless shelter but declined to

participate in the study because she "was unsure" where she would be living for follow-

up.

**Breastfeeding Experience**

Most mothers (85.9%) reported someone other than their physician had discussed

breastfeeding with them during their pregnancies while 36.7% had heard about

breastfeeding in the doctor's office. A smaller number had heard about breastfeeding in the prenatal clinic (13.7%) and a small number (3.6%) because they qualified for the WIC program during the pregnancy had heard about breastfeeding from the WIC program. Many women said they had heard about breastfeeding from another unnamed source (36.7%) and only a small number of women said they had not heard about breastfeeding (5.6%). While many mothers in the study reported hearing about breastfeeding, actual attendance at a breastfeeding class was less encouraging in that only a third (33.9%) attended a prenatal breastfeeding class.

Participants were also asked whether their mothers or a close family relative had breastfed. A large number of the mothers ($n = 212$, 85.1%) reported having a close family relative or their own mother who breastfed. When asked whether their husband or partner's mother or close family had breastfed, a large number ($n = 186$, 76.5%) of the paternal family had breastfed. Many ($n = 186$, 76.5%) reported their paternal family had breastfed. A few mothers did not know this information ($n = 57$, 22.8%) and said their partner's mother or close family had not breastfed. Most women had seen another woman breastfeed her infant ($n = 219$, 88%), while only a small number had not observed breastfeeding ($n = 30$, 12%).

### mPINC Variables

At the initial data collection session 76% of the mothers reported their infants were placed skin-to-skin after birth. Of the mothers reporting their infants were placed skin-to-skin, 75.6% reported it was within the first hour and 88.8% reported contact within 2 hours following delivery. The length of time that the infant experienced skin-to-

skin contact with the mother varied from no skin-to-skin contact (4.4%), less than 30 minutes (31.6%), at least 30 minutes (30.4%), to more than 30 minutes (32.0%). For vaginal deliveries infants spent an average of 26 minutes ($M = 25.77$, $SD = 12.99$) in skin-to-skin contact, while mothers who experienced cesarean birth reported an average of 25 minutes ($M = 25.12$, $SD = 13.89$) of skin-to-skin contact with their infants (See Table 3).

Mothers were asked how soon after delivery they nursed their infants for the first time. There was some confusion about how much time elapsed between birth and the first time they nursed the infant. The mothers frequently reported they were sedated and often fatigued from laboring and unsure of how much time passed between birth and the first time they nursed their infant. This was more prevalent in the mothers who delivered by cesarean section. Many mothers, however, did remember nursing within the first hour; 34% were confident this had occurred and 31% were confident they nursed within the first 2 hours after delivery. Some mothers reported nursing their infants much later and ranged between 3 and 5 hours post-delivery. The average delay between delivery and first feeding for the sample was slightly over 2 hours ($M = 2.31$) with the majority of mothers reporting a 1 hour delay post-delivery (Mode = 1 hour; See Table 3).

Fifty-six percent of the sample reported their infants had not received any formula supplementation, 18% reported their infants had received one to two formula feedings, 7% reported their infants received three to four formula feedings, and 13% reported five or more formula feedings. The mean number of formula feedings was 1.86 with a mode of one feeding (See Table 3).

Additionally, a large number of mothers kept their babies in the hospital room with them all the time. Over half of all mothers in the sample (58%) reported rooming-in for 24 hours a day, 28% reported rooming-in for 18 hours a day, 8% reported rooming-in for 12 hours a day, and 2% reported rooming-in for 6 hours a day. Eight mothers (3%) reported rooming-in for 3 or less hours a day. The mean time that infants roomed-in with their mothers was 20.27 hours with a mode of 24 hours (See Table 3).

Table 3
*Means, Standard Deviations, Skewness, and Kurtosis of mPINC Variables Initial Sample*
*(n = 250)*

| Variable | *M* | *SD* | Skewness | Kurtosis |
|---|---|---|---|---|
| Length of skin-to-skin contact | 25.36 | 13.49 | -0.357 | -1.43 |
| Time to nurse | 2.31 | 1.42 | 0.706 | -0.685 |
| Formula feeds | 1.86 | 1.15 | 0.976 | -0.639 |
| Rooming-in hours | 20.27 | 5.43 | -1.59 | 2.11 |

Table 4 presents a comparison of the reports from the total study sample, types of delivery, and CDC recommendations.

Table 4

*mPINC Variables and CDC Recommendations (n = 250)*

| Variable | Study | Vaginal Delivery | Cesarean Delivery | CDC Recommendation |
|---|---|---|---|---|
| Skin-to-skin contact | 76% | 89.4% | 63.5% | 100% |
|    Within 1 hour | 75.6% | 92.7% | 60% | 100% Vaginal Deliveries |

Table 4 continued)

| Variable | Study | Vaginal Delivery | Cesarean Delivery | CDC Recommendation |
|---|---|---|---|---|
| Within 2 hours | 88.8% | 98.4% | 80.2% | 100% Cesarean Deliveries |
| Length | 62.4% at 30 Minutes or more | 60.9% | 74.8% | 100% at 30 Minutes or more |
| Nurse within 1 hour of birth | 33.6% | 49.6%-1hr 27.6%-2hr | 18.3%-1hr 34.1%-2hr | 100% |
| Limited supplements | 56% | 62.6%-none 17.9%-one | 50.4%-none 18.4%-one | No Supplements Unless Medically Indicated |
| Rooming-in 24 hours | 58% | 61.5% | 55.6% | 100% |

## Study Instrument Results

For descriptive purposes, data collected at 10 days and 8 weeks postpartum are discussed in this section.  Of the 250 surveys mailed to participants, only 124 were returned at 10 days and 119 were returned at 8 weeks postpartum. Breastfeeding outcomes were calculated using Labbok and Krasovec's (1990) schema based on the reported number of formula feeds and the number of breastfeeds at 10 days and 8 weeks postpartum.

Full breastfeeding was assigned when 100% of feeding was breast milk at 10 days. In the study, 85 mothers (62.3% vaginal Deliveries, 57.5%, cesarean deliveries) were exclusively feeding their infants breast milk. Partial breastfeeding was defined when women reported 80% breastfeeding or only one to two formula feeds; 16 mothers (13% vaginal deliveries, 9.6% cesarean deliveries) fell in this category. Medium breastfeeding

was defined as breastfeeding between 20% and 80% (three to seven formula feeds) of the total; 17.4% of the mothers delivering vaginally and 20.5% of the mothers delivering by cesarean section fell in this category. The final category, low breastfeeding, was determined when mothers breastfed less than 20% or gave their infants eight or more formula feeds a day; 14 mothers (7.2% vaginal deliveries and 12.3% of the cesarean deliveries) were classified in this category (See Table 5).

Table 5

*Breastfeeding Outcomes at 10 Days by Delivery Type (n = 124)*

|          | Full  | Partial | Medium | Low   |
|----------|-------|---------|--------|-------|
| Vaginal  | 62.3% | 13%     | 17.4%  | 7.2%  |
| Cesarean | 57.5% | 9.6%    | 20.5%  | 12.3% |

At 8 weeks postpartum 119 surveys were returned. Results were calculated using the same criteria regarding number of formula feeds and number of breastfeeds at 8 weeks postpartum. Based on the same criteria, 57% of mothers delivering vaginally and 44.8% delivering by cesarean section reported full breastfeeding at 8 weeks postpartum, while 14% of mothers delivering vaginally and 22.4% of mothers delivering by cesarean section fell in the partial breastfeeding category at 8 weeks postpartum. For the medium breastfeeding category, 14.8% of mothers delivering vaginally and 27.6% of mothers delivering by cesarean section were identified in this category at 8 weeks postpartum. Finally 14.8% of the mothers delivering vaginally and 5.2% of mothers delivering by cesarean section reported low breastfeeding at 8 weeks postpartum.

Table 6

*Breastfeeding Outcomes at 8 Weeks by Delivery Type (n = 119)*

|  | Full | Partial | Medium | Low |
|---|---|---|---|---|
| Vaginal | 57.4% | 14.1% | 14.8% | 14.8% |
| Cesarean | 44.8% | 22.4% | 27.6% | 5.2% |

When looking into the use of a lactation consultant or support group, at 10 days postpartum, out of the responding 124 participants only 29 mothers (40%) sought help from a lactation consultant and only three mothers (2.9%) joined a breastfeeding support group. At 8 weeks postpartum a total of 119 participants responded to the survey and of these, only 23 mothers (39.7%) consulted with a lactation consultant and only two mothers (3.4%) attended a breastfeeding support group.

Out of the 93 sets of complete data, breastfeeding outcomes were similar. There were 48 sets of complete data from the vaginal delivery mothers and 45 sets of complete data from the cesarean delivery mothers. At 10 days postpartum, 57.4% of the vaginal delivery mothers were experiencing full breastfeeding, 14.1% reported partial breastfeeding, 14.8% reported medium breastfeeding, and 14.8% reported low breastfeeding (See Table 7). At 10 days postpartum, the cesarean delivery mothers reported 44.8% full breastfeeding, 22.4% partial breastfeeding, 27.6% medium breastfeeding, and 5.2% low breastfeeding (See Table 7).

Table 7

*Breastfeeding Outcomes at 10 Days by Delivery Type (n = 93)*

|          | Full  | Partial | Medium | Low   |
|----------|-------|---------|--------|-------|
| Vaginal  | 57.4% | 14.1%   | 14.8%  | 14.8% |
| Cesarean | 44.8% | 22.4%   | 27.6%  | 5.2%  |

At 8 weeks postpartum the breastfeeding outcomes were determined in the complete data sets and the mothers delivering vaginally reported 60.4% full breastfeeding, 14.6% partial breastfeeding, 14.6% medium breastfeeding, and 10.4% low breastfeeding (See Table 8). At 8 weeks postpartum the mothers delivering by cesarean section reported 48.9% full breastfeeding, 24.4% partial breastfeeding, 22.2% medium breastfeeding, and 4.4% low breastfeeding (See Table 8).

Table 8

*Breastfeeding Outcomes at 8 Weeks by Delivery Type (n = 93)*

|          | Full  | Partial | Medium | Low   |
|----------|-------|---------|--------|-------|
| Vaginal  | 60.4% | 14.6%   | 14.6%  | 10.4% |
| Cesarean | 48.9% | 24.4%   | 22.2%  | 4.4%  |

## Breastfeeding Self-efficacy Scores

Breastfeeding self-efficacy scores are self-reported scores on a 14-item survey tool asking mothers a variety of questions about their level of confidence breastfeeding their infants with possible choices of 1 (*not at all confident*), 2 (*not very confident*), 3 (*sometimes confident*), 4 (*confident*), and 5 (*very confident*). The scores were then added to create a total score for breastfeeding self-efficacy. Higher scores indicated higher breastfeeding self-efficacy and lower scores indicated lower breastfeeding self-efficacy. The possible scores ranged from a high of 70 to a low of 14. See Table 9 for means, standard deviation, skewness, and kurtosis.

Table 9

*BFSE Scores at 24 to 48 Hours, 10 Days, and 8 Weeks Postpartum*

| Variable | Number of participants (actual) | *M* | *SD* | Skewness | Kurtosis |
|---|---|---|---|---|---|
| BFSE-Initial | 249 | 46.24 | 10.40 | -.382 | .111 |
| BFSE-10 days | 124 | 48.57 | 11.21 | -.751 | .564 |
| BFSE- 8 weeks | 116 | 50.65 | 14.13 | -1.029 | .860 |

When the data were eliminated from the incomplete data sets 93 data sets were left with complete data for the three collection points. Table 10 displays the BFSE scores

for the complete data sets and reflects composite scores from both vaginal deliveries and cesarean section deliveries.

Table 10

*BFSE Scores at 24 to 48 Hours, 10 Days, and 8 Weeks Postpartum Complete Data Sets (n=93)*

| Variable | *N* | *M* | *SD* | Skewness | Kurtosis |
|---|---|---|---|---|---|
| BFSE-initial | 93 | 44.95 | 9.48 | -.457 | .181 |
| BFSE-10days | 93 | 49.40 | 10.41 | -.884 | 1.565 |
| BFSE-8 weeks | 93 | 51.69 | 12.93 | -.920 | .849 |

Mothers who delivered vaginally had a mean BFSE score of 44.85 ($SD = 10.36$). Mothers delivering by cesarean section had a mean initial BFSE score of 45.06 ($SD = 8.56$) at 24 to 48 hours postpartum (See Table 11).

Table 11

*BFSE Scores at 24 to 48 Hours, 10 Days, and 8 Weeks Vaginal Deliveries*

| Variable | *N* | *M* | *SD* | Skewness | Kurtosis |
|---|---|---|---|---|---|
| BFSE-initial | 48 | 44.85 | 10.36 | -.444 | .408 |
| BFSE-10days | 48 | 50.25 | 9.60 | -.410 | -.073 |
| BFSE-8 weeks | 48 | 52.56 | 13.72 | -1.071 | .937 |

Breastfeeding self-efficacy scores for cesarean deliveries were very similar to the scores for vaginal deliveries (See Table 12).

Table 12

*BFSE Scores at 24 to 48 Hours, 10 Days, and 8 Weeks Cesarean Deliveries*

| Variable | *N* | *M* | *SD* | Skewness | Kurtosis |
|---|---|---|---|---|---|
| BFSE-initial | 45 | 45.06 | 8.56 | -.467 | -.498 |
| BFSE-10days | 45 | 48.51 | 11.25 | -1.158 | 2.287 |
| BFSE-8 weeks | 45 | 50.77 | 12.12 | -.795 | 1.121 |

**Hypotheses Testing**

Based on the nature of the variables and their level of measurement, several statistical analyses were implemented: multiple regression analysis, ANOVA, ANCOVA, and chi-square analysis. All of the inferential analyses required normally distributed variables (Mertler & Vannatta, 2004); therefore, an examination of the distributional properties of all observed variables was conducted. Following data cleaning procedures, analyses indicated the values of kurtosis and skewness was within acceptable ranges. Use of maximum likelihood procedures states that as a rule of thumb, data may be assumed to be acceptable if skew and kurtosis indicators are within the range of +/- 1.0 to 2.0 (Hildebrand, 1986). The assumptions of multivariate normality were evaluated by the above scores and also by assessing the spread of the participants along the variables of interest. When inspecting histograms of the variables, all the variables of interest

graphically displayed an approximate normal distribution. After screening for accuracy and missing values, complete data sets for 93 participants were available. Each research question and hypothesis is discussed in order.

**Research Question 1**

Does type of delivery, skin-to-skin contact, time of first feeding, number of supplemental feedings, and hours rooming-in with the infant predict breastfeeding self-efficacy for first time mothers at 24 to 48 hours, 10 days, and 8 weeks postpartum?

The first null hypothesis was type of delivery (vaginal or cesarean section), skin-to-skin contact, time of first feeding, number of supplemental feedings, and hours rooming-in with the infant would not significantly predict breastfeeding self-efficacy scores at 24 to 48 hours postpartum, 10 days postpartum, or 8 weeks postpartum.

The second null hypothesis was type of delivery (vaginal or cesarean section), skin-to-skin contact, time of first feeding, number of supplemental feedings, and hours rooming-in with the infant would not significantly predict breastfeeding self-efficacy scores at 10 days postpartum.

The third null hypothesis was type of delivery (vaginal or cesarean section), skin-to-skin contact, time of first feeding, number of supplemental feedings, and hours rooming-in with the infant would not significantly predict breastfeeding self-efficacy scores at 8 weeks postpartum.

Data were screened to identify missing data, outliers, and to fulfill test assumptions, and linearity was analyzed by creating a scatter plot matrix (Appendix 9). Univariate normality was also assessed and histograms and normality tests indicated

some non-normal distributions; however, as the distributions were not too extreme,

normality and homoscedasticity were examined through the generation of a residuals plot

within another preliminary regression. The residuals plot was somewhat scattered but

again was not extreme (Appendix 9). Multivariate normality and homoscedasticity were

assumed. The simultaneous multiple regression analysis was computed to test the first

hypothesis. It was predicted that the independent variables would predict initial BFSE

scores at different collection times to determine which of the independent variables were

significant predictors for scores on the BFSE scale at 24 to 48 hours postpartum. The

following predictors were entered into the regression model: delivery type, skin-to-skin

contact within the first 2 hours of life, breastfeeding within 1 to 2 hours following birth,

avoiding formula feedings, and rooming-in with the infant most of the time (See Table

13).

Table 13

*Correlation Matrix for Research Question 1 (24 to 48 Hours Postpartum)*

| Variable | Initial BFSE | Delivery type | Skin-to-skin | Time to nurse | Formula feedings | Rooming-in |
|---|---|---|---|---|---|---|
| Initial BFSE | 1.000 | | | | | |
| Delivery type | .011* | 1.000 | | | | |
| Skin-to-skin | .138 | -.184 | 1.000 | | | |
| Time to nurse | -.093 | .198 | -.274 | 1.000 | | |
| Formula feedings | -.097 | .230 | -.068 | .289 | 1.000 | |
| Rooming-in | .096 | -.033* | .005* | .014* | .045* | 1.000 |

*Indicates the values were significant at the <.05 level

Based on the correlation matrix there did not seem to be any linear relationships between initial BFSE and the predictors though some of the predictors were significant at <.05. Mode of delivery and initial BFSE were significantly correlated, $r = .011$, $p < .05$. The number of hours rooming-in was significantly correlated with delivery mode ($r = -.033$, $p < .05$), skin-to-skin ($r = .005$, $p < .05$), time to first nursing ($r = .014$, $p < .05$), and the number of formula feedings ($r = .045$, $p < .05$).

Multiple regression analysis was used to test whether the mPINC variables of delivery mode, skin-to-skin contact, time to first breastfeeding, formula supplementation, and rooming-in significantly predicted breastfeeding self-efficacy at 24 to 48 hours postpartum. Results of the regression indicated the predictors predicted only 4% of the variance, $R^2 = .042$, $F (5.87) = .767$, $p > .05$. Results indicated the overall model was not significant; the proposed predictors were not successful in predicting the mother's initial breastfeeding self-efficacy, failing to reject the null hypothesis. A summary of regression coefficients is presented in Table 14.

Table 14

*Regression Results for Research Question 1 at 24 to 48 Hours Postpartum*

| Variable | B | β | t | p |
|---|---|---|---|---|
| Delivery mode | 1.317 | .070 | .633 | .528 |
| Skin-to-skin | 5.054 | .132 | 1.194 | .236 |
| Time to nurse | -.294 | -.044 | -.388 | .699 |

Table 14 (continued)

| Variable | B | β | *t* | *p* |
|---|---|---|---|---|
| Number of Formula feeds | -.838 | -.096 | -.860 | .392 |
| Rooming-in Hours | .204 | .102 | .975 | .332 |
| R Square | .042 | | | |
| *F* Value | .767 | | | |
| *P* Value | .576 | | | |

The simultaneous multiple regression analysis was computed to test the second

hypothesis at 10 days postpartum to determine which of the independent variables were

significant predictors for scores on breastfeeding self-efficacy at 10 days postpartum. The

following predictors were entered into the regression model: delivery type, skin-to-skin

contact within the first 2 hours of life, breastfeeding within 1 to 2 hours following birth,

avoiding formula feedings, and rooming-in with the infant most of the time (See Table

15).

Table 15

*Correlation Matrix for Research Question 1 (10 Days Postpartum)*

| Variable | BFSE 10 days | Delivery mode | Skin-to-skin | Time to Nurse | Formula Feedings | Rooming-in |
|---|---|---|---|---|---|---|
| BFSE 10 days | 1.000 | | | | | |
| Delivery Mode | -.084 | 1.000 | | | | |

*Table 15 (continued)*

| Variable | BFSE 10 days | Delivery mode | Skin-to-skin | Time to Nurse | Formula Feedings | Rooming-in |
|---|---|---|---|---|---|---|
| *Skin-to-skin* | .074 | -.184 | 1.000 | | | |
| *Time to Nurse* | -.241 | .198 | -.274 | 1.000 | | |
| *Formula Feedings* | -.081 | .230 | -.068 | .289 | 1.000 | |
| *Rooming-in* | .004* | -.033* | .005* | .014* | .045* | 1.000 |

\* indicates the values were significant at the <.05 level

Based on the correlation matrix there did not seem to be any linear relationships between breastfeeding self-efficacy at 10 days postpartum and the predictors though some of the predictors were significant at < .05. Rooming-in and BFSE at 10 days were significantly correlated, $r = .004$, $p < .05$. The number of hours rooming-in was significantly correlated with delivery mode ($r = -.033$, $p < .05$), skin-to-skin ($r = .005$, $p < .05$), time to first nursing ($r = .014$, $p < .05$), and the number of formula feedings ($r = .045$, $p < .05$).

Multiple regression analysis was used to test whether the mPINC variables of delivery mode, skin-to-skin contact, time to first breastfeeding, formula supplementation, and rooming-in significantly predicted breastfeeding self-efficacy at 10 days postpartum. Results of the regression indicated the predictors predicted only 6% of the variance, $R^2 = .060$, $F(5,87) = 1.101$, $p > .05$. Results indicated the overall model was not significant and failed to reject the null (See Table 16).

Table 16

*Regression Results for Research Question 1 (10 Days Postpartum)*

| Variable | B | β | *t* | *p* |
|---|---|---|---|---|
| Delivery Mode | -.745 | -.036 | -.330 | .743 |
| Skin-to-skin | .143 | .003 | .031 | .975 |
| Time to Nurse | -1.689 | -.231 | -2.043 | .044 |
| Formula # | -.057 | -.006 | -.054 | -.957 |
| Rooming-in hours | .014 | .007 | .063 | .950 |
| R Square | .060 | | | |
| *F* Value | 1.101 | | | |
| *P* Value | .366 | | | |

The simultaneous multiple regression analysis was computed to test the third hypothesis at 8 weeks postpartum to determine which of the independent variables were significant predictors for scores on breastfeeding self-efficacy at 8 weeks postpartum. The following predictors were entered into the regression model: initial BFSE score, delivery type, and skin-to-skin contact within the first 2 hours of life, breastfeeding within 1 to 2 hours following birth, number of formula feedings, and rooming-in with the infant most of the time (See Table 17).

Table 17

*Correlation Matrix for Research Question 1 (8 Weeks Postpartum)*

| Variable | BFSE 8 weeks | Delivery mode | Skin-to-skin | Time to Nurse | Formula Feedings | Rooming-in | BFSE Initial |
|---|---|---|---|---|---|---|---|
| BFSE 8 weeks | 1.000 | | | | | | |
| Delivery mode | -.069 | 1.000 | | | | | |
| Skin-to-skin | .035* | -.184 | 1.000 | | | | |
| Time to Nurse | -.287 | .198 | -.274 | 1.000 | | | |
| Formula Feedings | -.199 | .230 | -.068 | .289 | 1.000 | | |
| Rooming-in | -.025* | -.033* | .005* | .014* | .045* | 1.000 | |
| BFSE Initial | .416 | .011* | .138 | -.093 | -.097 | .096 | 1.000 |

*indicates values were significant at the <.05 level

Based on the correlation matrix there were linear relationships between BFSE at 8 weeks postpartum, skin-to-skin contact, and time rooming-in. The predictors of skin-to-skin contact with the infant, rooming-in hours, and initial BFSE were significant at < .05. Rooming-in and BFSE at 8 weeks postpartum were significantly correlated, $r = -.025$, $p < .05$. The number of hours rooming-in was significantly correlated with delivery mode ($r = -.033$, $p < .05$), skin-to-skin ($r = .005$, $p < .05$), time to first nursing ($r = .014$, $p < .05$),

and the number of formula feedings ($r = .045$, $p < .05$). Initial BFSE and delivery mode were also significantly correlated, $r = .011$, $p < .05$.

Multiple regression analysis was used to test whether the mPINC variables of delivery mode, skin-to-skin contact, time to first breastfeeding, formula supplementation, rooming-in, and initial BFSE predicted breastfeeding self-efficacy at 8 weeks postpartum. Results of the regression indicated the predictors predicted 26% of the variance, $R^2 =$ .256, $F(5,87) = 4.934$, $p < .05$. Results indicated the initial BFSE score and the time to first nursing the infant predicted BFSE scores at 8 weeks postpartum (See Table 18).

Table 18

*Regression Results for Research Question 1 (8 Weeks Postpartum)*

| Variable | B | β | t | p |
|---|---|---|---|---|
| Delivery Mode | -.648 | -.025 | -.247 | .798 |
| Skin-to-skin | -5.164 | .099 | -1.001 | .320 |
| Time to nurse | -.2.229 | -.246 | 2.426 | .017* |
| Formula # | -1.039 | -.087 | -.878 | .382 |
| Rooming-in hours | -.154 | -.057 | -.606 | .546 |
| Initial BFSE | .551 | .404 | 4.254 | .000 |
| R Square | .256 | | | |
| *F* Value | 4.934 | | | |
| *P* Value | .000 | | | |

*indicates values were significant at the <.05 level

**Research Question 2**

Do first time mothers who deliver by unplanned cesarean section and those who deliver vaginally have different breastfeeding self-efficacy at 10 days postpartum when both have experienced skin-to-skin contact within the 1 to 2 hours after birth, the first breastfeeding within the first to 2 hours, rooming-in with the infant, and limited supplemental feedings?

The null hypothesis was receiving similar breastfeeding support mothers who deliver by unplanned cesarean section and those who deliver vaginally would not have similar breastfeeding self-efficacy at 10 days postpartum.

A test of homogeneity of variance (Levene statistic) was computed to confirm equal variances among the groups. Results showed no significant differences between groups, suggesting homogeneity of variance among the different BFSE scores (.476, 1-91, $p > .05$; .095, 1-91, $p > .05$; See Table 19).

Table 19

*ANOVA*

| Variable | *M* | *SD* | *F* value | *P* value |
|---|---|---|---|---|
| Initial BFSE | 44.95 | 9.48 | .012 | >.05 |
| BFSE 10 days | 49.40 | 10.41 | .645 | >.05 |

The main effects of BFSE scores for the two groups of mothers (i.e., vaginal deliveries and cesarean sections) were compared using a one-way ANOVA at two times:

initial, $F(1,91) = .012$, $p > .05$; and 10 days postpartum $F(1,91) = .645$, $p > .05$. No significant differences were found, thereby failing to reject the null hypothesis.

**Research Question 3**

What combination of mPINC variables and delivery mode best predicts breastfeeding outcomes (defined as full, partial, token, and none) among first time mothers at 8 weeks postpartum?

The first null hypothesis was the mPINC variables of skin-to-skin contact, time to first feeding, type of delivery, number of formula feeds, and hours rooming-in would not predict breastfeeding outcomes at 10 days postpartum.

Breastfeeding outcomes were defined as full, partial, medium, and low using the schema of Labbok and Krasovec (1990). Full breastfeeding or exclusive breastfeeding was based on the mother reporting no formula feedings, partial breastfeeding was the mother reporting one to two formula feeds per day (80% breastfeeding), medium breastfeeding was three to seven formula feeds per day (20% to 80% breastfeeding), and low breastfeeding was eight or more formula feeds per day (less than 20% breastfeeding).

For the 93 complete data sets at 10 days postpartum, 64.5% of the mothers reported they were exclusively breastfeeding. Fourteen percent reported partial breastfeeding, 16% reported medium breastfeeding, and 5.4% reported low breastfeeding (See Table 20).

Table 20

Correlation Matrix for Research Question 3 (Hypothesis 1) at 10 Days Postpartum

| Variable | Breastfeeding category | Delivery Mode | Skin-to-skin | Time to Nurse | Formula Feedings | Rooming-in |
|---|---|---|---|---|---|---|
| Breastfeeding Category | 1.000 | | | | | |
| Delivery Mode | .044 | 1.000 | | | | |
| Skin-to-skin | -.012* | -.184 | 1.000 | | | |
| Time to Nurse | .116 | .198 | -.274 | 1.000 | | |
| Formula Feedings | .373 | .230 | -.068 | .289 | 1.000 | |
| Rooming-in | .200 | -.033* | .005* | .014* | .045* | 1.000 |

*indicates values were significant at the <.05 level

When testing the hypothesis using a simultaneous multiple regression the relevant variable showed a significant overall model, $F = 3.673$ (5, 87), $p < .005$. With the first regression the overall model was significant. The model was able to account for 17% of the variance with the proposed predictors. The individual predictor of the number of formula feedings given in the first 24 to 48 hours postpartum significantly predicted breastfeeding outcomes ($\beta = .369$, $p < .005$) 10 days postpartum, which was consistent with current literature. See Table 21 for regression results.

*Table 21*

Regression Results for Research Question 3 (Hypothesis 1) at 10 Days Postpartum

| Variable | B | β | *t* | *p* |
|----------|------|------|------|------|
| Delivery Mode | -.068 | -.036 | -.354 | .724 |
| Skin-to-skin | .039 | .010 | .099 | .922 |
| Time to Nurse | .011 | .017 | .162 | .872 |
| Formula # | .320 | .369 | 3.558 | .001 |
| Rooming-in hours | .036 | .181 | 1.857 | .067 |
| R Square | .174 | | | |
| *F* Value | 4.934 | | | |
| *P* Value | .005 | | | |

The second null hypothesis was the mPINC variables of skin-to-skin contact, time to first feeding, type of delivery, number of formula feeds, and hours rooming-in would not predict breastfeeding outcomes at 8 weeks postpartum.

For the 93 complete data sets at 8 weeks postpartum the same breastfeeding outcomes were used as described above. At 8 weeks postpartum, 54.8% of the mothers reported they were exclusively breastfeeding. Nineteen percent reported partial breastfeeding, 18.3% reported medium breastfeeding, and 7.5% reported low breastfeeding. For the regression at 8 weeks postpartum an additional predictor of breastfeeding self-efficacy was added. See Table 22 for correlations.

*Table 22*

Correlation Matrix for Research Question 3 (Hypothesis 2) at 8 Weeks Postpartum

| Variable | Breastfeeding category | Delivery mode | Skin-to-skin | Time to Nurse | Formula feedings | Rooming-in | Initial BFSE |
|---|---|---|---|---|---|---|---|
| Breastfeeding Category | 1.000 | | | | | | |
| Delivery Mode | .036* | 1.000 | | | | | |
| Skin-to-skin | .031* | -.184 | 1.000 | | | | |
| Time to Nurse | .138 | .198 | -.274 | 1.000 | | | |
| Formula Feedings | .295 | .230 | -.068 | .289 | 1.000 | | |
| Rooming-in | .007* | -.033* | .005* | .014* | .045* | 1.000 | |
| Initial BFSE | -.143 | .011* | .138 | -.093 | -.097 | .096 | 1.000 |

* Significant at <.05

Delivery mode and breastfeeding category were significantly correlated ($r = .036$, $p < .05$), and skin-to-skin contact and breastfeeding category were significantly correlated ($r = .031$, $p < .05$). Rooming-in with the infant was significantly correlated with breastfeeding category ($r = -.007$, $p < .05$), delivery mode ($r = -.033$, $p < .05$), skin-to-skin contact ($r = .005$, $p < .05$), time to first nurse the infant ($r = .014$, $p < .05$), and the number of formula feedings ($r = .045$, $p < .05$). The initial BFSE score was significantly correlated with delivery mode ($r = .011$, $p < .05$).

Simultaneous multiple regression was used to test whether any of the variables significantly predicted breastfeeding outcomes at 8 weeks postpartum. The results of the regression indicated none of the variables were successful in predicting breastfeeding

outcomes at 8 weeks postpartum. The overall model was not significant ($R^2$ = .110,

$F(6,86)$ = 1.765, $p$ > .05) and the model was only able to account for 11% of the variance

with the proposed predictors. None of the predictors individually were successful in

predicting breastfeeding outcomes at 8 weeks postpartum as displayed in Table 23.

Table 23

*Regression Results for Research Question 3 (Hypothesis 2) 8 Weeks Postpartum*

| Variable | B | β | t | p |
|---|---|---|---|---|
| Delivery mode | -.049 | -.025 | -.230 | .819 |
| Skin-to-skin | .334 | .083 | .767 | .445 |
| Time to Nurse | .053 | .076 | .682 | .497 |
| Formula # | .250 | .272 | 2.500 | .014* |
| Rooming-in hours | .001 | .004 | .036 | .971 |
| Initial BFSE | -.013 | -.121 | -1.167 | .246 |
| R Square | .110 | | | |
| *F* value | 1.765 | | | |
| *P* value | .116 | | | |

* Significant at <.05

Based on the second regression the overall model was not significant, the

proposed predictors were not successful in predicting breastfeeding outcomes at 8 weeks

postpartum. The null hypothesis could not be rejected.

**Research Question 4**

Is there a difference in breastfeeding outcomes between first time mothers

delivering vaginally and those delivering by cesarean section when adjusted for

breastfeeding self-efficacy scores at 10 days postpartum?

The null hypothesis was mothers delivering by cesarean section would not have

significantly different breastfeeding outcomes from those delivering vaginally when

adjusted for BFSE at 10 days postpartum.

The data met the assumptions for ANCOVA, and a test of homogeneity of

variance (Levene statistic) was computed to confirm equal variances among the groups.

Results showed no significant differences between groups, suggesting homogeneity of

variance among the different BFSE scores (2.856,(1,91), $p > .05$).

The main effect of delivery mode was not significant, $F(1,93) = .032$, $p > .005$.

Mothers delivering vaginally did not differ on breastfeeding outcomes from those

delivering by cesarean section when adjusted for BFSE scores at 10 days postpartum. The

interaction between mode of delivery and BFSE was also not significant (See Table 24).

Table 24

*ANCOVA*

| Source | SS | df | MS | F | p |
|---|---|---|---|---|---|
| Between | 8,319 | 2 | 4.160 | 5.093 | .008 |
| BFSE 10 day | 8.158 | 1 | 8,158 | 9.988 | .002 |
| Delivery | .026 | 1 | .026 | .032 | .859 |
| Error | 73.509 | 90 | .817 | | |
| Total | 327,000 | 93 | | | |

**Research Question 5**

Is there a relationship between mode of delivery and breastfeeding outcomes at 10 days and 8 weeks postpartum?

The null hypothesis was there would be no difference in breastfeeding outcomes in mothers who deliver by cesarean section and those who deliver vaginally.

Chi-square analysis results using the dependent variable of delivery type indicated type of delivery was not significantly related to breastfeeding outcome at 10 days postpartum, $\chi^2$ (1, $N = 93$) = .818, $p > .05$.  Overall, 64.6% of the mothers who had a vaginal delivery were exclusively breastfeeding (100%) 10 days postpartum compared to 64.4% of the mothers who delivered by cesarean section, which was clearly not statistically significant (See Table 25).

Table 25

*Breastfeeding Outcome by Delivery Type at 10 Days Postpartum*

| Breastfeeding Category | Vaginal Delivery $N = 48$ | Cesarean Section $N = 45$ |
|---|---|---|
| Full (100%) | 64.6% | 64.4% |
| Partial (80%) | 16.7% | 11.1% |
| Medium (20%-80%) | 14.6% | 17.8% |
| Low (<20%) | 4.2% | 6.7% |

Chi-square analysis results using the dependent variable of delivery type indicated type of delivery was not significantly related to breastfeeding outcomes at 8 weeks postpartum, $\chi^2$ (1, $N = 93$) = .31, $p > .05$. There was no statistical relationship between mode of delivery and breastfeeding outcome at 8 weeks. At 8 weeks postpartum, 60.4% of mothers delivering vaginally were exclusively breastfeeding compared to 48.9% of cesarean section mothers (See Table 26).

Table 26

*Breastfeeding Outcome by Delivery Type at 8 Weeks Postpartum*

| Breastfeeding Category | Vaginal Delivery $N = 48$ | Cesarean Section $N = 45$ |
|---|---|---|
| Full (100%) | 60.4% | 48.9% |
| Partial (80%) | 14.6% | 24.4% |
| Medium (20%-80%) | 14.6% | 22.2% |
| Low (<20%) | 10.4% | 4.4% |

The null hypothesis could not be rejected as there was no difference in breastfeeding outcomes compared to delivery type at 10 days or 8 weeks postpartum.

# CHAPTER FIVE: DISCUSSION OF FINDINGS

The purpose of this study was to evaluate the impact of unplanned cesarean section on breastfeeding self-efficacy and breastfeeding outcomes for first time mothers who experienced breastfeeding support similar to that given to mothers who deliver vaginally.

The discussion of findings is presented in the following sections: (a) a discussion of the sample, (b) interpretation of the findings, (c) strengths and limitations of the study, (d) implications for clinical practice, and (e) recommendations for further research.

## The Sample

A total of 250 first time mothers were recruited from the postpartum population of a large community hospital located in North Virginia. All of the first time mothers on the unit were eligible for the study if they were breastfeeding, spoke English, and consented to participate. Of the participants, 126 mothers delivered by cesarean section and 124 mothers delivered vaginally. All of the mothers in this study had initiated breastfeeding and were breastfeeding at the time of initial contact 24 to 48 hours postpartum. The mothers were normally distributed for age and ethnicity although many were more highly educated than expected and had higher incomes. There were fewer African American women than expected, which may be due to the lower numbers who choose to nurse their infants (Ahluwalia et al., 2011).

## Interpretation of Findings

The five research questions were designed to test the effect of delivery on the mothers' breastfeeding self-efficacy and breastfeeding outcomes at 10 days and 8 weeks postpartum.

### Research Question 1

Does type of delivery, skin-to-skin contact, time of first feeding, number of supplemental feedings, and hours rooming-in with the infant predict breastfeeding self-efficacy for first time mothers at 24 to 48 hours, 10 days, and 8 weeks postpartum?

This question evaluated the effect of the recommendations from the CDC of skin-to-skin contact for at least 30 minutes following birth, first feeding within 1 hour, limiting supplemental feedings, and rooming-in with the infant 24 hours a day (mPINC variables), along with the type of delivery, vaginal or cesarean section, on breastfeeding self-efficacy scores at 24 to 48 hours postpartum, 10 days postpartum, and 8 weeks postpartum.

The first null hypothesis evaluating the variables on breastfeeding self-efficacy at 24 to 48 hours postpartum failed to be rejected. Type of delivery did not impact BFSE when skin-to-skin contact, limiting formula feedings, nursing the infant within the first hour, and rooming-in with the infant occurred.

The second null hypothesis evaluating the variables of skin-to-skin contact for at least 30 minutes following birth, first feeding within 1 hour (2 hours for cesarean section), limiting supplemental feedings, rooming-in with the infant 24 hours a day, and delivery type on BFSE scores at 10 days postpartum also failed to be rejected. The type of delivery did not impact BFSE scores at 10 days postpartum when skin-to-skin contact,

limiting formula feedings, nursing the infant within the first hour, and rooming-in with the infant occurred.

The third null hypothesis evaluating the variables of skin-to-skin contact for at least 30 minutes following birth, first feeding within 1 hour (2 hours for cesarean section deliveries), limiting supplemental feedings, rooming-in with the infant 24 hours a day, delivery type, and initial BFSE score on BFSE scores at 8 weeks postpartum was rejected. The analysis revealed two of the variables, nursing the infant within 1 hour for vaginal deliveries and 2 hours for cesarean section deliveries and the initial BFSE score, did predict higher breastfeeding self-efficacy at 8 weeks postpartum.

**Research Question 2**

Do first time mothers who deliver by unplanned cesarean section and those who deliver vaginally have different breastfeeding self-efficacy at 10 days postpartum when both have experienced skin-to-skin contact within the 1 to 2 hours after birth, the first breastfeeding within the first to 2 hours, rooming-in with the infant, and limited supplemental feedings? The consideration was that mothers delivering by cesarean section would have recovered from surgery sufficiently to feel as self-confident with breastfeeding as the mothers who delivered vaginally by 10 days postpartum.

Breastfeeding support was defined as following the CDC recommendations of skin-to-skin contact for at least 30 minutes after birth, nursing the infant within 1 hour for vaginal deliveries and 2 hours for cesarean section deliveries, limiting supplemental feedings, and rooming-in with the infant 24 hours a day. No differences were found in the

BFSE scores of mothers at 10 days postpartum by type of delivery. The null hypothesis failed to be rejected.

**Research Question 3**

What combination of mPINC variables and delivery mode best predicts breastfeeding outcomes (defined as full, partial, token, and none) among first time mothers at 8 weeks postpartum?

Breastfeeding outcomes were defined following Labbok and Krasovec's (1990) schema of full breastfeeding or exclusive breastfeeding based on the mother reporting no formula feedings, partial breastfeeding based on the mother reporting one to two formula feeds per day (80% breastfeeding), medium breastfeeding based on three to seven formula feeds per day (20 to 80% breastfeeding), and low breastfeeding based on the mother reporting eight or more formula feeds per day (less than 20% breastfeeding).

The first null hypothesis was rejected as the individual variable of the number of formula feedings given in the first 24 hours of life did impact breastfeeding outcomes at 10 days postpartum. This was consistent with the findings of other studies (Murray et al., 2007) that reported decreased duration of breastfeeding by mothers who supplemented with formula in the early postpartum period.

The second null hypothesis failed to be rejected; none of the predictors were successful in predicting breastfeeding outcomes at 8 weeks postpartum.

**Research Question 4**

Is there a difference in breastfeeding outcomes between first time mothers delivering vaginally and those delivering by cesarean section when adjusted for breastfeeding self-efficacy scores at 10 days postpartum?

ANCOVA results indicated there was no difference in the two groups of mothers, those delivering vaginally and those delivering by cesarean section. The breastfeeding outcomes from both delivery types were similar regardless of the breastfeeding self-efficacy score. The null hypothesis failed to be rejected. At 10 days postpartum 59.9% of the mothers were exclusively breastfeeding, 11% of the mothers were partially breastfeeding, 19% were in the medium breastfeeding group, and 10% were in the low breastfeeding group. This finding was supported by the Ontario Mother and Infant Study (Ip et al., 2009), which found more mothers who had an unplanned cesarean section initiated breastfeeding and were more likely to be continuing to exclusively breastfeed in the 3 months following delivery (Watt et al., 2012). The finding contradicted Zanardo et al. (2010) who found women planning a cesarean birth had lower rates of breastfeeding in the immediate postpartum period and in the weeks following birth. Zanardo's (2010) study population was of mothers who requested and received a cesarean birth, not of women who planned to deliver vaginally but had an unplanned cesarean birth. Little is known about women who chose elective cesarean birth.

**Research Question 5**

Is there a relationship between mode of delivery and breastfeeding outcomes at 10 days and 8 weeks postpartum?

Using chi-square analysis revealed no difference in the breastfeeding outcomes of women who delivered vaginally and those who delivered by cesarean section. There were slight differences in the percentages of mothers breastfeeding exclusively but no statistical significance. Overall, 33% of the mothers who had a vaginal delivery were exclusively breastfeeding at 10 days postpartum compared to 31% of the mothers who delivered by cesarean section. At 8 weeks postpartum, 31% of mothers delivering vaginally were exclusively breastfeeding compared to 23% of cesarean section mothers. This was not the extreme difference found in the Ontario Mother and Infant Study (Chambers et al., 2010) that the mothers who delivered by unplanned cesarean section were more successful with breastfeeding than their peers who had a vaginal delivery.

**Summary**

In summary, the statistical analysis provided support for the CDC recommended practices of skin-to-skin contact, first nursing within 1 hour for vaginal deliveries and 2 hours for cesarean section deliveries, limiting formula supplementation, and rooming-in when related to breastfeeding self-efficacy. There was limited support for the impact of formula feeding and breastfeeding outcomes at 10 days postpartum, but by 8 weeks postpartum the impact of those early supplements seemed to have faded. There was no impact of the type of delivery on breastfeeding outcomes at 10 days or 8 weeks postpartum when adjusted for breastfeeding self-efficacy. Finally, no difference was found in breastfeeding outcomes based upon delivery type, vaginal or cesarean section.

## Strengths and Limitations of the Study

The initial data collected were rich in descriptive details of the women having their first baby and planning to breastfeed. Hospital practices consistent with the CDC recommendations were supported in that both groups, vaginal and cesarean births, were supported with skin-to-skin contact, initiation of first feedings, and rooming-in for 24 hours a day. In this sample, 85% of the women reported their mothers had breastfed, which is a factor in proliferation of the custom.

The high attrition rate in the study was a major limitation. With three data collection points attrition was expected but was vastly exceeded by these participants. It is likely some of the mothers did not realize the importance of returning the surveys. Only two surveys were returned to the researcher from the U.S. Postal Service as undeliverable. Three mothers asked that the researcher send their surveys electronically rather than by mail but none of these mothers answered or returned the e-mails. In these instances the researcher also mailed a survey to their homes and two returned the mailed survey. One 10 day survey was returned to the researcher 5 months after data collection was closed and analysis had already occurred. Only 93 data sets were complete with the initial data, 10 day data, and 8 week data, which was an insignificant number for this study. There was concern that the surveys that were not returned were due to the mothers quitting breastfeeding, which would make major changes to the statistical tests that had significant findings. The findings are therefore not generalizable to the larger population.

**Implications for Clinical Practice**

The major clinical practice implication is the number of supplemental feedings given in the immediate postpartum period. One statistical analysis supported the hypothesis that giving supplemental feedings in the early postpartum period impacted breastfeeding outcomes at 10 days postpartum. These feedings may be given due to low glucose levels in the neonate immediately postpartum but it is unlikely the infant had low glucose levels for the 48 hours of hospitalization. Also current practice by most hospitals is to recommend supplemental feedings if an infant has lost more than 10% of birth weight in the 48 hours following birth, some of the infants in this study have been supplemented on advice of the pediatrician. It has been suggested that early postpartum supplementation is related to the development of obesity, a factor in health concerns for the long-term. Another finding that emerged from the study was following the CDC recommendation for rooming-in for 24 hours a day, which was positively associated with breastfeeding self-efficacy in several of the correlations. This has implications for nursing in that often parents, especially mothers, are perceived by the nurses, as tired and needing uninterrupted sleep. The nurses may encourage the parents to take the baby back to the nursery so they can rest. Although it is a commendable thought it is not supported in the literature. Parents actually get more rest if the infant is in the room with them and only fed breast milk (Doan et al., 2007). The postpartum units of this particular hospital have quiet hours from 1 to 4 p.m. when visitors are discouraged and parents can rest undisturbed during the day. The finding of increased breastfeeding self-efficacy at the initial data point positively impacting breastfeeding self-efficacy at 10 days postpartum

supports the social cognitive theory. The parents in this study had made a thoughtful decision to breastfeed their infants. They were, as Bandura (2001) suggested, proactive, self-organizing, self-reflecting, and self-regulating. Many of the mothers had themselves been breastfed which provided them with knowledgeable role models in their mothers and for many, their husbands' mothers. The mothers frequently asked for feedback and advice from those around them who they perceived to be knowledgeable, their nurse, the researcher, or the lactation consultant. It is possible that improved methods and medications for pain relief also play a part in relieving pain, particularly in the cesarean birth mothers, and help the mothers feel more confident in assuming their role. The finding in this study drives home the point that getting parents started out well with their breastfeeding experience will lead to improved self-efficacy later in their feeding experience. This also supports Labbok and Taylor (2008) in their work identifying the early postpartum as a period when the mother is most amenable to breastfeeding support. Breastfeeding practices recommended by the CDC may be delayed in the early postoperative period for the mother experiencing a cesarean section and the mother may not see or hold her infant until much later when the infant has passed through the early alert phase and is well into deep sleep phase, delaying breastfeeding initiation. Care must be taken to offer additional support to this vulnerable family.

**Implications for Further Research**

Efforts should continue to examine the effect of breastfeeding education for prospective parents on breastfeeding duration and exclusiveness. Working with the CDC recommendations for skin-to-skin contact, early breastfeeding, and 24 hour a day

rooming-in will also provide impetus to future research studies. Studies should be done to evaluate supplementation of breastfeeding in those infants losing 10% or more of their birth weight.  Thought should be given to designing research and interventions to support mothers' confidence in their ability to nurse their infants and nurses' ability to build their confidence in the antenatal, intrapartum, and postpartum periods. Exploring the time at which mothers return to work either part-time or full-time and its effect on breastfeeding practices is another area of potential research. As more hospitals attain the Baby Friendly designation it would be interesting to determine whether the practices associated with the designation potentiate exclusive breastfeeding for a longer period of time. Another area for additional research is examining the lived experience of mothers who terminated breastfeeding early in the postpartum period.

# APPENDIX 1

## Script for Staff Nurse

Mrs. _____, our nurse educator would like to speak with you about participating in a research study. Would you be willing to speak with her? Is this a good time? She can come back in an hour if that would work better?

## APPENDIX 2

## Researchers Introductory Script


Hello, my name is Candice Sullivan, I am one of the nurses here and I'm working on my

PhD at George Mason University.  As part of my education I am conducting a

breastfeeding study and I would like to include you if you are interested.  The study

involves filling out a survey now then another short survey that I will mail to you in ten

days and filling out another short survey that I will mail to you in eight weeks.

All you would need to do is fill out the surveys and mail them back to me in the

envelopes provided.

   I need to ask you to read and sign the informed consent before you get started.  Would

that be alright for you?

# APPENDIX 3

## Informed Consent

Title:   Does type of delivery impact breastfeeding self efficacy and outcome?
Principal Investigator: Candice J. Sullivan

## Informed Consent for a Research Study

### Introduction and Purpose of the Study
You are eligible to participate in a research study.  The purpose of the study is to compare breastfeeding self efficacy (self confidence) and duration in mothers who had an unplanned cesarean section with mothers who delivered vaginally. The results of this survey will be used to identify and improve the breastfeeding experience of mothers who deliver by cesarean section. Completion of the survey should take approximately 15 minutes. About 250 people are expected to take part in this study.

### What will happen if I take part in this research study?
If you agree to participate, please sign this consent form and retain the extra copy for your records. Please complete the attached survey.  Place both the signed consent form and the survey in the return envelope and return to Candice Sullivan the researcher.

There are two follow up surveys that are part of the research. If you are willing to be contacted, please print your mailing address and provide your phone number on page 3 of this form. You will receive a mailed survey at ten days postpartum and again at eight weeks postpartum to complete and return by mail.

### What risks or benefits can I expect from being in the study?
The only foreseeable risk to you is possible loss of confidentiality.  There are no benefits to you for participating in the study.

### Will my medical information be kept private?
Efforts have been made to protect your identity. Your medical record and your infant's medical record will be reviewed for eligibility in the study and number of feedings.  You and your infant's records will be kept private to the extent allowed by law.  Medical records and research material are stored and kept according to legal requirements. You will not be identified in any reports or publications about this study. However, certain people and entities will have access to your research and medical records. The Inova Institutional Review Board (IRB) and federal and state agencies that have authority over the study may look at your research and medical records.  Members of the study staff will also have access to your research and medical records.  You may request a copy of the research results by contacting Candice Sullivan at Candice.sullivan@inova.org or 703-776-8731.

### What other choices do I have if I do not take part in this study?
Taking part in this research study is voluntary.  If you choose not to participate, there will be no penalty or loss of benefits to which you are otherwise entitled.

### Who can answer my questions about the study?
If you have any questions regarding this research study, please contact Candice Sullivan at 703-776-8731. If you would like additional information about your rights as a participant in a research study, contact the Inova Human Research Protection Program at:

(703) 776-3167
Human Research Protection Program
Inova Fairfax Hospital
3300 Gallows Road
Falls Church, VA  22042

INITIALS:_____

Title:   Does type of delivery impact
breastfeeding self efficacy and outcome?
Principal Investigator: Candice J. Sullivan

APPROVED: Inova IRB
Date Approved: October 19, 2012
Authorized by: Laura Miller, IRB Manager
IRB File #12-1105
Expiration Date: 10/18/2013

1RESCNT

## Authorization to Use and Disclose Information for Research Purposes

This authorization form will explain how your Medical Record will be used, protected, and disclosed (shared).   In addition, you will receive a summary of Inova Health System's "Notice of Privacy Practices". If you agree to participate in the research, and authorize the use and disclosure of your medical information for research purposes, please sign this form.  If you choose not to authorize the use and disclosure of your health information you may not participate in the research study. Your health care benefits will not be affected if you do not sign this authorization.

**What protected health information about me will be used or disclosed as part of this research?**

You will be asked for health information relevant to the study.  In addition, your medical records will be reviewed and researchers may need to discuss your health information with your treating nurse(s), if applicable.   Researchers will also acquire new information about you as a result of the research questionnaires/interviews. This information constitutes your "Research Record".

**The following is health information that will be obtained from your medical record:**
- We will collect data from your medical record including demographics, your obstetrical history, and clinical information including type of delivery and recovery time.  We will also collect data from your infant's record to determine feeding patterns, difficulties, and birth weight.

**Who will be authorized to use or disclose your protected health information?**
If you agree to participate in the study, you authorize the investigators and research study staff to use and disclose your protected health information contained in your Research Record.

**To whom will the protected health information be disclosed?**
- Institutions, investigators outside Inova Health System participating in the research.
- Inova Institutional Review Board, the hospital committee that oversees the research.

**Your information may be given to:**
- Federal and state agencies that have authority over the study, Inova Health System, or patients. Government agencies include the U.S. Food and Drug Administration (FDA), and the U.S. Department of Health and Human Services (DHHS).

All reasonable efforts will be used to protect the confidentiality of your protected health information which may be disclosed with others in support of this research. Once your health information is shared with the sponsor, federal agencies and others as described above, there is no guarantee that these recipients will not further disclose your protected health information to other persons who may not be bound by this authorization, or who otherwise may be permitted to use or disclose your protected health information in ways that you do not intend.

**Why is it necessary to share my protected health information with others?**
The reason is to conduct the research as described in the consent form for the research study.

INITIALS:_____
Protocol date: May 2012
Consent version #1      / Date: October 16, 2012

Title: Does type of delivery impact
breastfeeding self efficacy and outcome?
Principal Investigator: Candice J. Sullivan

APPROVED: Inova IRB
Date Approved: October 19, 2012
Authorized by: Laura Miller, IRB Manager
IRB File #12-1105
Expiration Date: 10/18/2013

1RESCNT

**How long does my authorization remain in effect?**
This authorization has no expiration date. It remains in effect unless you revoke it.

**How can I revoke my authorization?**
You may revoke your authorization at any time by sending a written request to Candice Sullivan The Inova Learning Network 3300 Gallows Road Falls Church Virginia 22042. If you revoke your authorization, your participation in the study will end and no further private health information will be acquired. The study staff may keep or disclose information obtained before you revoked your authorization in order to preserve the scientific integrity of the study.

If you choose not to authorize the use and disclosure of your health information or withdraw from the study, you will continue to have access to medical care at the Inova Health System.

**Will I have access to the information in my Research Record?**
You have the right to request access to the information in your Research Record from the investigators and research staff.

**SIGNATURE:**
I have been informed about this research study's purpose, procedures, and possible risk. I voluntarily consent to participate in this research study. I will contact a member of the research team if I have any questions.

_____          _____          _____
Signature of Participant                 Printed Name of Participant              Date

Phone Number: _____          Mailing Address: _____

_____          _____


_____


_____          _____          _____
Signature of Witness                     Printed Name of Witness                  Date


_____          _____          _____
Signature of Person Obtaining Consent    Printed Name                            Date


INITIALS: _____
Protocol date: May 2012
Consent version #1    / Date: October 16, 2012

# APPENDIX 4

## Initial Data and Demographics

**Circle One:   Cesarean Section/ Vaginal Birth**

**Please answer the following questions by checking a response or writing the answer in the space provided.**

**1.  After your baby's birth was he/she placed on your bare skin wearing only a diaper?**

☐ 1. Yes   1

☐ 2. No    0

**2.  Was your baby placed skin-to-skin with you before he/she was an hour old?**

☐ 1. Yes   1

☐ 2. No    0

**3.  Was your baby placed skin-to-skin with you before he/she was two hours of age?**

☐ 1. Yes       1

☐ 2. No        0

**4.  How long was your baby placed skin-to-skin with you?**

☐ 1. My baby was not placed skin-to-skin with me            0

☐ 2. My baby was placed on my skin less than 30 minutes    10

☐ 3. My baby was placed on my skin at least 30 minutes     30

☐ 4. My baby was placed on my skin more than 30 minutes   40

**5.  How soon after your baby's birth did you get to nurse your baby?**

☐ 1. Within the first hour 1

☐ 2. Within two hours    2

☐ 3. Within three hours    3

☐ 4.  Within four hours    4

☐ 5. More than four hours after birth  5

☐ 6. I have not nursed my baby  0

**6.  Since your baby was born has he/she received any formula feedings?**

☐ 1. Yes  0

☐ 2. No   1

**7.  How many formula feedings has your baby had?**

☐ 1. none

☐ 2. 1-2

☐ 3. 3-4

☐ 4. 5 or more

**8.  How many hours a day does your baby stay in the room with you?**

**(Except for brief visits to the nursery)**

☐ 1. 24 hours

☐ 2. 18 hours

☐ 3. 12 hours

☐ 4. 6 hours

☐ 5. 3 or less hours

**9.  With which ethnic group do you most closely identify ?**

☐ 1. White    ☐ 2. Black/African American  ☐ 3.American Indian/Alaska Native

☐ 4. Hawaiian Native/Pacific Islander   ☐ 5.  Hispanic/Latino  ☐ 6. Asian-Korean

☐ 7.  Asian- Chinese  ☐ 8.  Asian – Vietnamese  ☐ 9.  Asian- Japanese

☐ 10. Middle Eastern  11.  Another  (specify): _____

**10.** What is your primary language?

    ☐ 1. English            ☐ 2. Spanish

    ☐ 3. Some other language (specify): _____

**11.  How old were you on your last birthday?** _____ years old

**12.  What is your highest level of education?**

    ☐ 1. Grade School

    ☐ 2. High school diploma or GED

    ☐ 3. Some college/Associate's degree/technical certificate

    ☐ 4. Bachelor's degree

    ☐ 5. Graduate degree (e.g., Master's, Ph.D., J.D.)

**13.  What is your current employment status?**

    ☐ 1. Working for pay at a job or business

    ☐ 2. Looking for work, not currently employed

    ☐ 3. Not currently working and not looking for work

**14**.  **In 2011, what was your total family income from all sources?  Was it:**

    ☐ 1. Less than $25,000,

    ☐ 2. $25,000 to $49,999,

    ☐ 3. $50,000 to $100,000, or

    ☐ 4. More than $100.000?

**15.  Where are you currently living?**

    ☐ 1. With your spouse or with a partner?

    ☐ 2. With parents or other relatives?

    ☐ 3. Alone

☐ 4. Other (please describe)_____

**16**. **During your pregnancy did anyone discuss breastfeeding with you?**

    ☐ 1. Yes

    ☐ 2. No

**17.** **If you heard about breastfeeding was it:**

    ☐ 1. In the prenatal clinic?

    ☐ 2. While in the doctor's office?

    ☐ 3. From the WIC program?

    ☐ 4. Other?  Please describe_____

    ☐ 5. I did not hear about breastfeeding

**18**. **Did your mother or a close family relative breastfeed?**

    ☐ 1. Yes

    ☐ 2. No

**19**. **Did your husband or partner's mother or close family breastfeed?**

    ☐ 1. Yes

    ☐ 2. No

**20.** **During your pregnancy did you attend a breastfeeding class?**

    ☐ 1. Yes

    ☐ 2. No

**21.** **Have you seen another woman breastfeed an infant?**

    ☐ 1. Yes

    ☐ 2. No

**22.** **Infant's birth weight_____**

**23.** **What was your prepregnancy weight?_____**

**4. Are you a WIC RECIPIENT?**

☐ 1. Yes

☐ 2. No

**For each of the following statements, please choose the answer that best describes how confident you are with breastfeeding your new baby. Please mark you answer by circling the number that is closest to how you feel. There is no right or wrong answer.**

        **1= not at all confident**
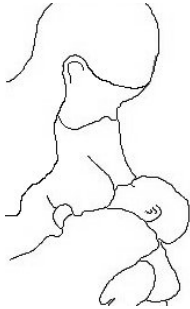        **2= not very confident**
        **3 sometimes confident**
        **4= confident**
        **5=very confident**    ©Dr. Cindy-Lee Dennis

| | | | | | |
|---|---|---|---|---|---|
| **1. I can always determine that my baby is getting enough milk** | **1** | **2** | **3** | **4** | **5** |
| **2. I can always successfully cope with breastfeeding, like I have with other challenging tasks** | **1** | **2** | **3** | **4** | **5** |
| **3. I can always breastfeed my baby without using formula as a supplement** | **1** | **2** | **3** | **4** | **5** |
| **4. I can always ensure that my baby is properly latched on for the whole feeding** | **1** | **2** | **3** | **4** | **5** |
| **5. I can always manage the breastfeeding situation to my satisfaction** | **1** | **2** | **3** | **4** | **5** |
| **6. I can always manage to breastfeed even if by baby is crying** | **1** | **2** | **3** | **4** | **5** |
| **7. I can always keep wanting to breastfeed** | **1** | **2** | **3** | **4** | **5** |
| **8. I can always comfortably breastfeed with my family members present** | **1** | **2** | **3** | **4** | **5** |
| **9. I can always be satisfied with my breastfeeding experience** | **1** | **2** | **3** | **4** | **5** |
| **10. I can always deal with the fact that breastfeeding can be time consuming** | **1** | **2** | **3** | **4** | **5** |
| **11. I can always finish feeding my baby on one breast before switching to the other breast** | **1** | **2** | **3** | **4** | **5** |
| **12. I can always continue to breastfeed my baby for every feeding** | **1** | **2** | **3** | **4** | **5** |
| **13. I can always manage to keep up with my baby's breastfeeding demands** | **1** | **2** | **3** | **4** | **5** |
| **14. I can always tell when my baby is finished breastfeeding** | **1** | **2** | **3** | **4** | **5** |

Thank You for participating in my study.  Please feel free to contact me if you have any questions about the study.  My phone number is 703-776-8731 and my email is Candice.sullivan@inova.org

You will receive another survey from me at ten days after delivery and again at eight weeks after delivery by email or regular mail depending on your preference.  Please fill them in and return them in the envelope provided.

I appreciate your willingness to share your experience with me and assist me with completing my PhD  Thank you again.

**Data Survey at 10 Days and 8 Weeks Postpartum**

**Please answer the following questions by checking a response or writing the answer in the space provided.  Then return the survey in the envelope provided.  Thank you**

1.  How many times in a day do you feed your infant?  _____

2.  How many formula feedings does your infant receive each day? _____

3.  Have you met with a lactation consultant since you left the hospital?

   ☐ 1. Yes

   ☐ 2. No

4.  Have you attended a breastfeeding support group since you left the hospital?

   ☐ 1. Yes

   ☐ 2. No

   **For each of the following statements, please choose the answer that best describes how confident you are with breastfeeding your new baby.  Please mark you answer by circling the number that is closest to how you feel.  There is no right or wrong answer.**

   **1= not at all confident**
   **2= not very confident**
   **3 sometimes confident**
   **4= confident**
   **5=very confident**

| | | | | | |
|---|---|---|---|---|---|
| 1. I can always determine that my baby is getting enough milk | 1 | 2 | 3 | 4 | 5 |
| 2. I can always successfully cope with breastfeeding, like I have with other challenging tasks | 1 | 2 | 3 | 4 | 5 |
| 3. I can always breastfeed my baby without using formula as a supplement | 1 | 2 | 3 | 4 | 5 |
| 4. I can always ensure that my baby is properly latched on for the whole feeding | 1 | 2 | 3 | 4 | 5 |
| 5. I can always manage the breastfeeding situation to my satisfaction | 1 | 2 | 3 | 4 | 5 |
| 6. I can always manage to breastfeed even if by baby is crying | 1 | 2 | 3 | 4 | 5 |
| 7. I can always keep wanting to breastfeed | 1 | 2 | 3 | 4 | 5 |
| 8. I can always comfortably breastfeed with my family members present | 1 | 2 | 3 | 4 | 5 |
| 9. I can always be satisfied with my breastfeeding experience | 1 | 2 | 3 | 4 | 5 |
| 10. I can always deal with the fact that breastfeeding can be time consuming | 1 | 2 | 3 | 4 | 5 |
| 11. I can always finish feeding my baby on one breast before switching to the other breast | 1 | 2 | 3 | 4 | 5 |
| 12. I can always continue to breastfeed my baby for every feeding | 1 | 2 | 3 | 4 | 5 |
| 13. I can always manage to keep up with my baby's breastfeeding demands | 1 | 2 | 3 | 4 | 5 |
| 14. I can always tell when my baby is finished breastfeeding | 1 | 2 | 3 | 4 | 5 |

## APPENDIX 7
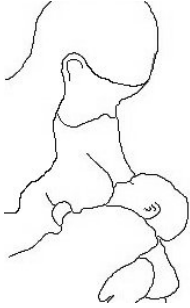
Thank you for participating in my study.  Please fill out the survey and mail it back to me in the envelope provided.  You will get one more survey from me at about eight weeks after you baby was born.  If you have  a question just send me an email at Candice.sullivan@inova.org

**APPENDIX 8**
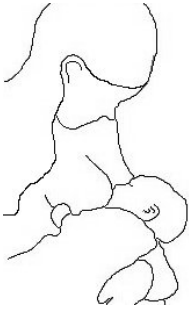
Thank you for participating in my study and helping me finish my education.  I really appreciate you taking the time to fill out the surveys and share your breastfeeding experience with me.  If you should at any time have questions about the study please feel free to email me at Candice.sullivan@inova.org

I wish you and your family the very best of luck in the coming years.  Candice

**Sullivan, Candice**

From: Cindy-Lee Dennis [cindylee.dennis@utoronto.ca]
Sent: Monday, June 18, 2012 11:20 AM
To: Sullivan, Candice
Subject: RE: BFSE-SF
Attachments: BSES-SF.DOC

Hi Candice
As per our conversation, attached is my Breastfeeding Self-Efficacy Scale-short Form that you can use in your doctoral dissertation. Good luck with your studies.
Warm regards,
C-L Dennis

Cindy-Lee Dennis, PhD
Professor in Nursing and Medicine, Dept. of Psychiatry;
Canada Research Chair in Perinatal Community Health;
Shirley Brown Chair in Women's Mental Health Research, Women's College Research Institute;

University of Toronto
Lawrence S. Bloomberg Faculty of Nursing
155 College St
Toronto, Ontario
Canada M5T 1P8
Tel: (416) 946-8608
Fax: (416) 978-8222
www.cindyleedennis.ca

# Mothering Transitions
### RESEARCH

From: Sullivan, Candice [mailto:Candice.Sullivan@inova.org]
Sent: June 4, 2012 9:09 AM
To: Cindy-Lee Dennis
Subject: BFSE-SF

I would like very much to use your tool Breast feeding Self efficacy for my dissertation research. May I have your permission?

Candice J. Sullivan
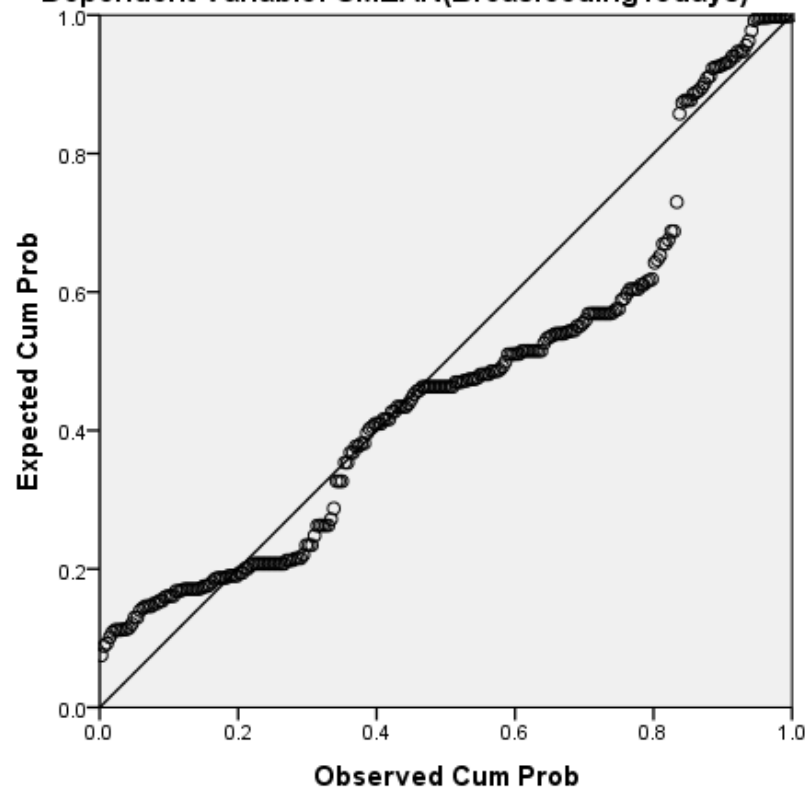MSN, RNC, LCCE
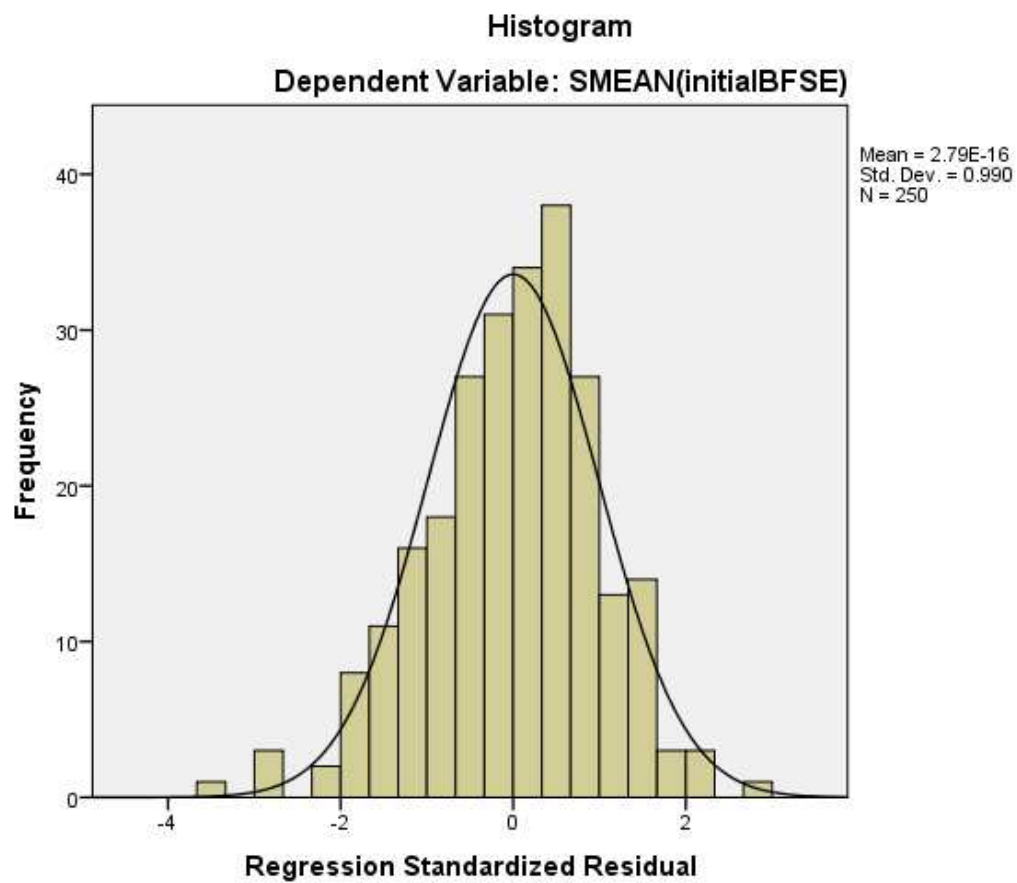Education Coordinator-ILN

**APPENDIX 10**

**Scatter plot matrix for skin-to-skin contact and Breastfeeding Self-Efficacy Score**



Partial Regression Plot
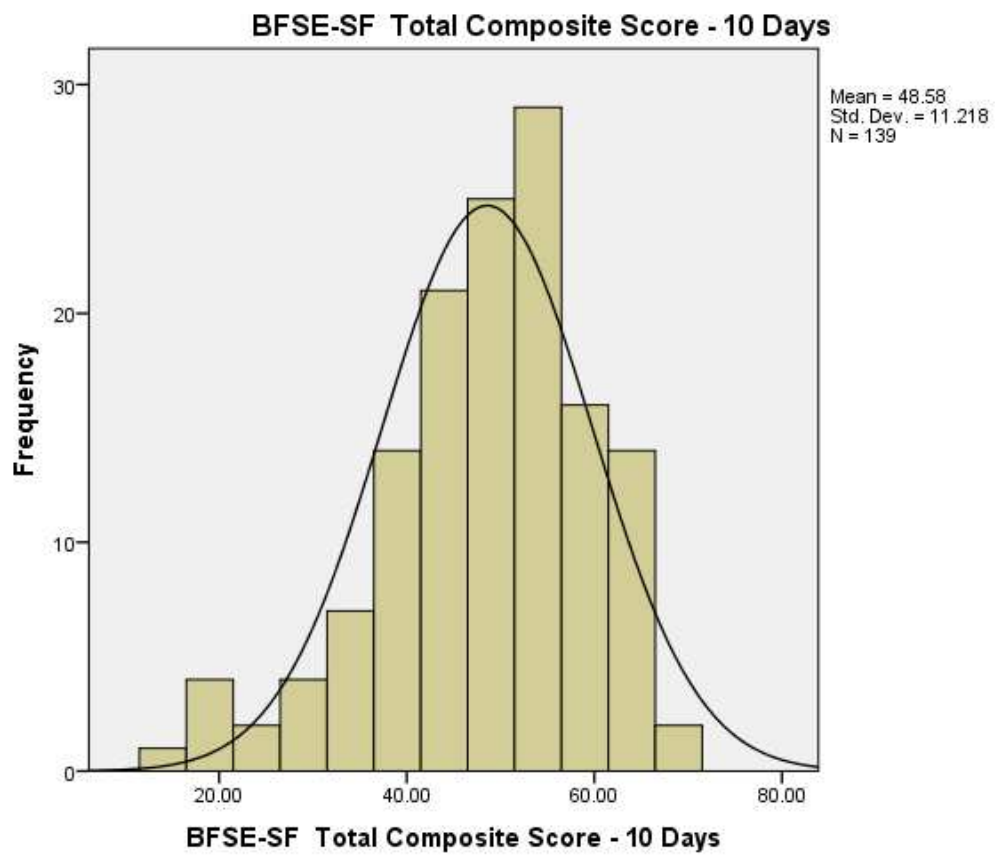Dependent Variable: SMEAN(BFSE10days)
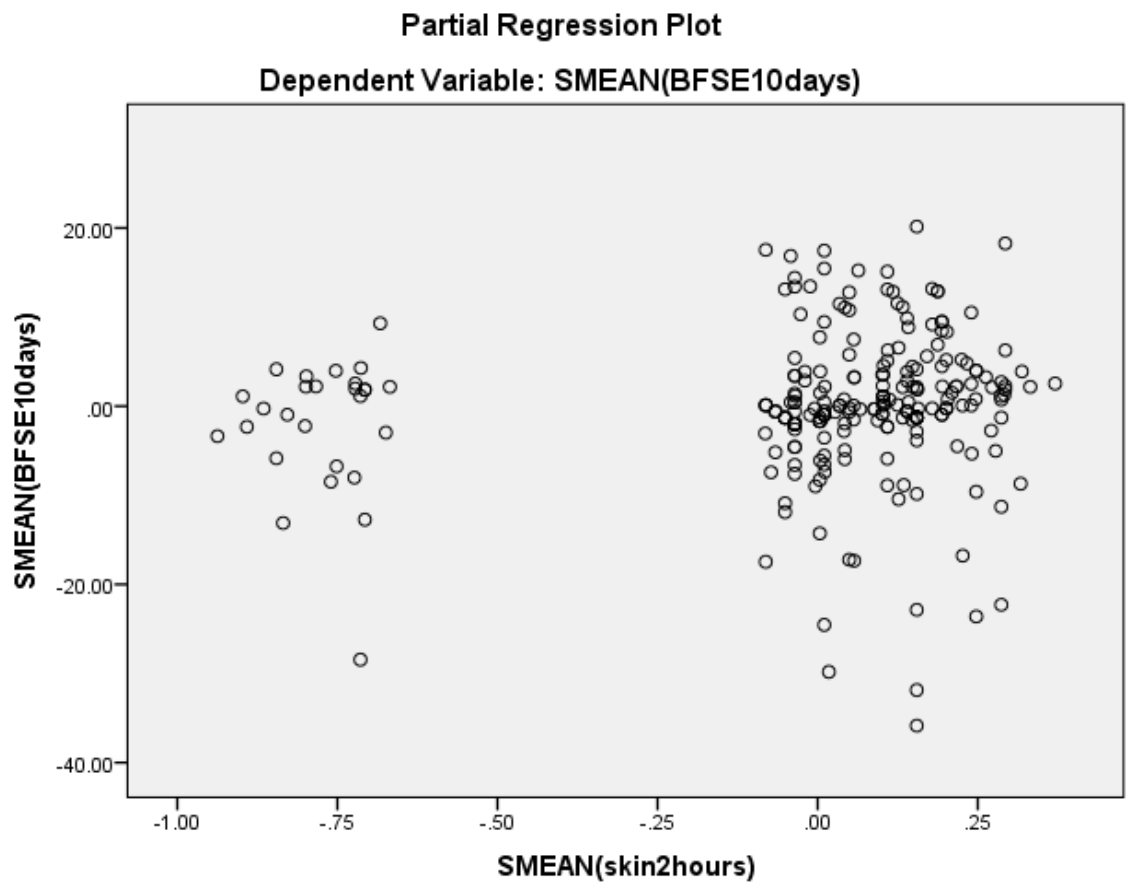
Normal P-P Plot of Regression Standardized Residual

Dependent Variable: SMEAN(Breasfeeding10days)

## Histogram

### Dependent Variable: SMEAN(initialBFSE)



Mean = 2.79E-16
Std. Dev. = 0.990
N = 250

BFSE-SF  Total Composite Score - 10 Days

Mean = 48.58
Std. Dev. = 11.218
N = 139

**Histogram**

Dependent Variable: SMEAN(BFSE8weeks)

Mean = -1.41E-14
Std. Dev. = 0.988
N = 250

# APPENDIX 11

## GMU HRB

**GEORGE MASON UNIVERSITY**
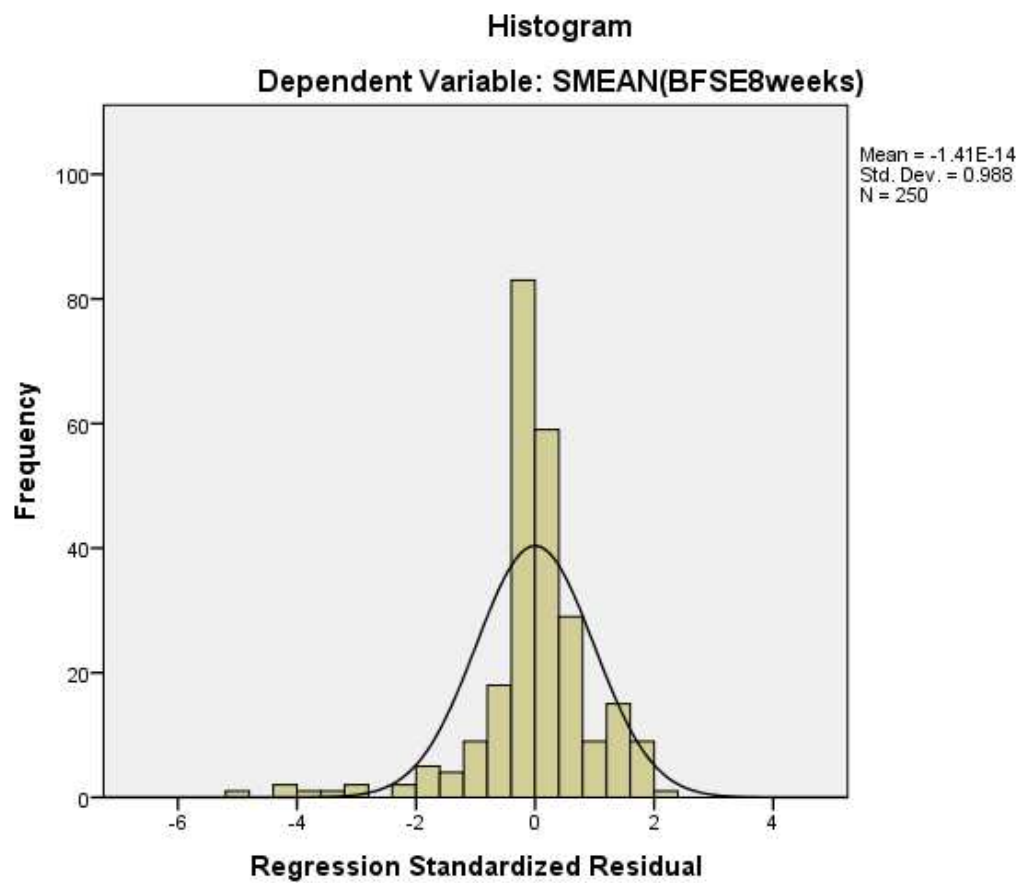
Office of Research Integrity and Assurance

Research Hall
4400 University Drive, MS 6D5, Fairfax, Virginia 22030
Phone: 703-993-4121; Fax: 703-993-9590

TO:           Marie Kodadek, College of Health and Human Services

FROM:         Aurali Dade
              Assistant Vice President, Research Compliance

PROTOCOL NO.: 8190

PROPOSAL NO.: N/A

TITLE:        Does Type of Delivery and Hospital Practices Impact Breastfeeding Efficacy and
              Outcome?

DATE:         October 22, 2012

Cc:           Candice Sullivan

Under George Mason University (GMU) procedures, this project was determined to be exempt by the Office of Research Integrity & Assurance (ORIA) since it falls under DHHS Exempt Category 2, research involving the use of educational tests (cognitive, diagnostic, aptitude, achievement), survey procedures, interview procedures or observation of public behavior.

You may proceed with data collection. **Please note that all modifications in your protocol must be submitted to the Office of Research Integrity & Assurance for review and approval prior to implementation**. Any unanticipated problems involving risks to participants or others, including problems regarding data confidentiality must be reported to the GMU ORIA.

GMU is bound by the ethical principles and guidelines for the protection of human subjects in research contained in The Belmont Report. Even though your data collection procedures are exempt from review by the GMU IRB, GMU expects you to conduct your research according to the professional standards in your discipline and the ethical guidelines mandated by federal regulations.

Thank you for cooperating with the University by submitting this protocol for review. Please call me at 703-993-5381 if you have any questions.

# APPENDIX 12

## Hospital IRB Approval

**INOVA HEALTH SYSTEM**

Inova Human Research Protection Program (HRPP)
Claude Moore Health Education & Research Building – 3rd Floor
Inova Fairfax Hospital
3300 Gallows Road
Falls Church, Virginia 22042-3300

Tel: 703-776-3167
Fax: 703-776-6678

### NOTICE OF APPROVAL FOR HUMAN SUBJECT RESEARCH

| | |
|---|---|
| **DATE:** | 10/15/2013 |
| **TO:** | Sullivan, Candice, Nursing |
| | Kodadek, Marie, Nursing , Friesen, Mary Ann, PhD, RN, CPHQ, Nursing |
| **FROM:** | Ababio, Kathy, IRB Coordinator, IRB Group B |
| **PROTOCOL TITLE:** | Does the type of delivery and hospital practices impact breastfeeding efficacy and outcomes at ten days and eight weeks postpartum |
| **FUNDING SOURCE:** | NONE |
| **PROTOCOL NUMBER:** | 12-1105 |
| **APPROVAL PERIOD:** | Approval Date: 10/14/2013 — Expiration Date: 10/13/2014 |

The Institutional Review Board (IRB) for the protection of human subjects has reviewed the protocol entitled: Does the type of delivery and hospital practices impact breastfeeding efficacy and outcomes at ten days and eight weeks postpartum. The project has been approved for the procedures and subjects described in the protocol. This protocol must be reviewed for renewal on a yearly basis for as long as the research remains active. Should the protocol not be renewed before expiration, all activities must cease until the protocol has been re-reviewed.

If approval did not accompany a proposal when it was submitted to a sponsor, it is the PI's responsibility to provide the sponsor with the approval notice.

This approval is issued under Inova Health System's Federal Wide Assurance 00000573 with the Office for Human Research Protections (OHRP). If you have any questions regarding your obligations under Committee's Assurance, please do not hesitate to contact us.

Please direct any questions about the IRB's actions on this project to the Inova IRB at 703-776-3167 or 703-776-3370 or Email: HRPP@inova.org.

Miller, Laura C.

Study is active closed to enrollment with data analysis only. 250 subjects were enrolled including 2 minors. Poor response rate after surveys were mailed out at 10 days and 8 weeks postpartum, only 139 responses at 10 days and 126 at eight weeks.
Expedited category (8) Continuing review of research previously approved by the convened IRB as follows: (c) where the remaining research activities are limited to data analysis.

| | |
|---|---|
| **Approval Period:** | 10/14/2013 through 10/13/2014 |
| **Review Type:** | EXPEDITED |
| **IRB Number:** | IRB00001101 |

Page: 1

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# APPENDIX 13

## Hospital IRB Extension

Inova Human Research Protection Program (HRPP)
Claude Moore Health Education & Research Building – 3rd Floor
Inova Fairfax Hospital
3300 Gallows Road
Falls Church, Virginia 22042-3300

Tel: 703-776-3167
Fax: 703-776-6678

### NOTICE OF APPROVAL FOR HUMAN SUBJECT RESEARCH

| | |
|---|---|
| **DATE:** | October 19, 2012 |
| **TO:** | Sullivan, Candice, Nursing |
| | Kodadek, Marie, Nursing , Friesen, Mary Ann, PhD, RN, CPHQ, Nursing |
| **FROM:** | Miller, Laura C., MSHA, CIP,IRB Manager, IRB Group B |
| **PROTOCOL TITLE:** | Does the type of delivery and hospital practices impact breastfeeding efficacy and outcomes at ten days and eight weeks postpartum |
| **FUNDING SOURCE:** | NONE |
| **PROTOCOL NUMBER:** | 12-1105 |
| **APPROVAL PERIOD:** | Approval Date: October 19, 2012     Expiration Date: October 18, 2013 |

The Institutional Review Board (IRB) for the protection of human subjects has reviewed the protocol entitled: Does the type of delivery and hospital practices impact breastfeeding efficacy and outcomes at ten days and eight weeks postpartum. The project has been approved for the procedures and subjects described in the protocol. This protocol must be reviewed for renewal on a yearly basis for as long as the research remains active. Should the protocol not be renewed before expiration, all activities must cease until the protocol has been re-reviewed.

If approval did not accompany a proposal when it was submitted to a sponsor, it is the PI's responsibility to provide the sponsor with the approval notice.

This approval is issued under Inova Health System's Federal Wide Assurance 00000573 with the Office for Human Research Protections (OHRP). If you have any questions regarding your obligations under Committee's Assurance, please do not hesitate to contact us.

Please direct any questions about the IRB's actions on this project to:

Miller, Laura C.

Consent version dated October 16, 2012.
Approved expedited category (7) Research on individual or group characteristics or behavior (including, but not limited to, research on perception, cognition, motivation, identity, language, communication, cultural beliefs or practices, and social behavior) or research employing survey, interview, oral history, focus group, program evaluation, human factors evaluation, or quality assurance methodologies.

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| **Approval Period:** | October 19, 2012 through October 18, 2013 |
| **Review Type:** | EXPEDITED |
| **IRB Number:** | IRB00001101 |

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# BIOGRAPHY

Candice J. Sullivan grew up in Missouri. She attended Trinity Lutheran Hospital School of Nursing where she received a Diploma of Nursing in 1970. She attended the University of Maryland, where she received her Bachelor of Science in 1982. She went on to receive her Master of Nursing from The Catholic University of America in 1987. She then received her Doctorate in Nursing from George Mason University in 2014. She is the Education Coordinator for Woman's Services at the Inova Health System.