

PRENATAL LACTATION COUNSELOR EFFECT ON BREASTFEEDING  
DURATION FOR MOTHERS AT RISK FOR EARLY WEANING

by

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## ABSTRACT

The main objective of this project was to determine the effectiveness of a prenatal consult with a Certified Lactation Counselor (CLC) on breastfeeding duration for mothers at risk for early weaning. We conducted a cohort study that utilized a blinded control trial design. Mothers were recruited from two large OBY/GYN clinics in the northwest United States, and participants were divided into a control group and an experimental group. The experimental group received the prenatal intervention which consisted of one consult with a CLC.

The results of the study indicated that mothers with lower scores on the BAPT (Breastfeeding Attrition Prediction Tool) control section showed a slight trend for decreased breastfeeding intensity at eight weeks postpartum as measured by the Index of Breastfeeding Status (IBS). Experimental and control groups had similar patterns in BAPT scores and IBS rates at eight weeks.

With the results in mind, the BAPT control section may be a useful tool for prenatal care providers to utilize to help identify mothers who are at high risk to not meet their breastfeeding goal. The results of this study neither support nor discourage the practice of referring high risk mothers to a lactation expert prenatally, but providers can consider this an option for providing additional breastfeeding education and support for their patients.

## CHAPTER I

## INTRODUCTION

According to the Center for Disease Control and Prevention (CDC, 2014), the percentage of infants who start out breastfeeding is at an all-time high of 79%, and for babies born in 2011, 49% are still breastfeeding at least part of the time at six months. These percentages show an encouraging trend, but they also show that many mothers are not meeting their breastfeeding goals. A prenatal survey conducted by the CDC found that 85% of women intend to breastfeed exclusively for at least three months, but 15% of these women had already given up on breastfeeding by the time they left the hospital. Only 32.4% of women who intend to breastfeed reach their duration goal (Perrine et al., 2012). Some of the main reasons why mothers discontinue breastfeeding include lack of support, going back to work, and challenges with breastfeeding (Joshi, Trout, Aguirre, Wilhelm, 2014; Langellier, Chaparro, & Whaley, 2012). Healthcare providers can be critical assets in supporting and educating mothers in both the pre and postnatal periods. Quality education that provides numerous opportunities for interaction, either in person, by telephone, or via the internet, can help women connect with appropriate resources and overcome breastfeeding barriers (Bonuck et al., 2014; Carlsen et al., 2013).

There are longstanding recommendations that support breastfeeding as an excellent, cost effective, and safe method for mothers to feed their babies. The American Academy of Pediatrics' (2012) longstanding recommendation is that infants be exclusively breastfed for the first six months of life, and continue to be breastfed along

with other foods for a year or longer. Numerous studies have confirmed the benefits of breastfeeding, but worldwide there continues to be widespread early cessation of breastfeeding. Many mothers are unable to breastfeed their babies for a variety of medical or personal reasons, and individual decisions about breastfeeding should be respected by healthcare professionals. However, healthcare professionals can play a pivotal role in helping mothers who wish to breastfeed reach their goals. By identifying common barriers to breastfeeding success and implementing evidenced based education techniques, healthcare providers can begin to offer the much needed guidance and support that nursing mother's need.

#### Statement of the Problem

The question this project seeks to answer is does prenatal breastfeeding education provided by a Certified Lactation Counselor (CLC) prolong breastfeeding duration and increase breastfeeding intensity compared to little or no education support from health care providers among high risk women who plan to breastfeed. Research has demonstrated the benefits of breastfeeding and numerous studies have supported the value of breastfeeding education, but it is still unclear exactly how and when health care providers should go about providing breastfeeding education in a manner that will likely have meaningful results.

### Purpose

The purpose of this project is to contribute to a shift in how breastfeeding education is initiated. The overall impact will be that more mothers are able to meet their breastfeeding goals. The recommendation right now is for expectant mothers with uncomplicated pregnancies to have ten to thirteen prenatal visits and receive breastfeeding education in all three trimesters (University of Michigan Health System, 2014), but there is little consistency in practice with how breastfeeding education is offered within these multitude of appointments. Recent legislation requires insurance plans to pay for a breast pump and the expertise of a lactation counselor, but not all insurance companies are in complete compliance at this time (U.S Department of Health and Human Services, 2014). Even with shifting insurance coverage, mothers typically do not seek out a lactation counselor or obtain a referral until breastfeeding problems have arisen (Miller, 2014). The purpose of this project is to transition lactation counselors into a role of primary prevention services. Right now, lactation counselors operate more in the context of secondary prevention; they are consulted after a problem with breastfeeding develops, but there are many lactation difficulties that could be avoided by utilizing an appointment with a lactation counselor during the prenatal period. The benefit of a prenatal consult is that it establishes a relationship between the lactation expert and the mother, and she will have the advantage of knowing where she can go for help if breastfeeding problems do arise after delivery.

### Project Objectives

The overall objective of this project was to increase and enhance the prenatal breastfeeding education that women receive while they are pregnant with the aim of helping more mothers successfully reach their breastfeeding goals. This was accomplished by developing collaboration between the prenatal clinics and local lactation experts and by trialing a potential screening and referral process to an individualized prenatal breastfeeding intervention. The project measured the impact of how coordinating one-to-one breastfeeding education during the prenatal period impacts the rate at which mothers are able to meet their breastfeeding goal.

This project had five main objectives. The first objective was to increase the rate of breastfeeding initiation at birth. The second objective was to increase the rate of exclusive breastfeeding at eight weeks postpartum. The third objective was to increase the proportion of women who are on track to meet their breastfeeding goal at eight weeks postpartum. The fourth objective was to identify a reliable screening tool for prenatal care providers to use to identify women who are at high risk to not meet their breastfeeding goal. The final objective was to identify a sustainable method for providers to refer high risk mothers to a lactation expert for additional breastfeeding support and education.

The first three objectives will be compared with those outlined by Healthy People 2020 (CDC, 2014). Currently over 53% of mothers in Montana are breastfeeding exclusively at three months, which exceeds the goal of 46.2% set by the Healthy People 2020 initiative (CDC, 2014). Unfortunately, at 50.7%, Montana falls short of the Healthy

People 2020 objective that 60.6% of infants will still be breastfed at least part of the time when they are six months old.

### Conceptual Framework

Imogene King's Goal Attainment Theory was used as a framework to guide this project. Goal Attainment Theory involves three interacting systems: personal, interpersonal, and social (King, 1996). The main assumption of this theory is that providers and patients interact and exchange information, work together to develop mutual goals, and then act to reach those goals (King, 1996). Within the context of this project, mothers interacted with their primary prenatal care provider and decided whether or not they intended to breastfeed their child. The goal of their provider was to connect women who planned to breastfeed with a CLC prior to delivery. The goal of the CLC was to work with the mother to identify her breastfeeding goals, and then work on a plan with her to help her achieve those goals. In this scenario, the mother played a very active role in the directing her breastfeeding education.

### Significance of the Project

It is often very upsetting for a woman to not meet her breastfeeding goals, and more often than not, her problems could have been successfully resolved with the proper help. Many mothers are concerned about having enough milk for their baby, what they will do if they have problems, and how they will manage going back to work and

breastfeeding. Health care providers and nurses frequently have concerns about how best to provide education for their patients in a way that is meaningful and useful.

The expectation that midwives, OB/GYNs, and pediatricians will incorporate breastfeeding education into their appointments with their patients may not be feasible considering the time constraints of an office visit. This reality presents the challenge of finding other ways to provide women with the education and support they need to be successful with breastfeeding. Incorporating the expertise of CLCs into routine prenatal care could be a promising alternative for providers to utilize in practice, and has shown promise in other translational research studies (Bonuck, Lischewski, & Brittner, 2009). This approach establishes a relationship between the mother and the lactation counselor and could prove to be valuable should the mother or infant experience breastfeeding problems in the postpartum period. Pediatricians do make referrals to lactation consultants for struggling postpartum mothers, but this is only after a breastfeeding problem has been presented. It is better to prevent a problem from occurring rather than try to correct them.

#### Operational Definition of Terms

For the purpose of this study, participants will be limited to women with uncomplicated pregnancies and a subsequent delivery of a healthy full term infant born after at least 37 weeks gestation and discharged from the hospital within six days of delivery. Mothers were also selected based on the criteria that they had expressed a desire to breastfeed at their initial prenatal appointment, spoke English, were 18 years or older,

and had a due date on or before August 31, 2015. Uncomplicated pregnancy status was determined by the woman's provider. Other factors that excluded participation included the chronic use of medications not compatible with breastfeeding, multiple gestation, and HIV-positive status.

Exclusive breastfeeding was defined as infants receiving only breast milk, either from the breast or expressed, and no artificial milk or solids. Partial breastfeeding includes infants who receive breast milk along with other forms of supplementation, including formula, juice, water, or other food items. The use of vitamin drops and water intake was not assessed. Weaning was defined as not having breastfed for 48 hours and not intending to breastfeed again.

Prenatal education was defined as having a single one-to-one consult with a certified lactation counselor at any time during the prenatal period. Initiation rate of breastfeeding was defined as having tried breastfeeding or expressing milk at least once during the postpartum period. Mothers were considered "high risk" for early cessation of breastfeeding if their BAPT control score was less than or equal to 40.

Women were classified as having met their breastfeeding goal if their breastfeeding status at eight weeks either fulfilled their breastfeeding goal or was on track meet their goal as they perceived it to be when interviewed at eight weeks.

### Assumptions and Limitations

This study involves several key assumptions. First of all, it is assumed that most women want to breastfeed and that breastfeeding is beneficial to both the mother and the child. It is also assumed that most mothers are capable of breastfeeding.

This study has had several limitations. First of all, the participants were a small convenience sample selected from two clinics. The majority of the participants were white. Therefore, the results of this project may be limited in how well they can be applied to a broader population. The second limitation was that the local hospital was in the process of becoming certified as Baby-Friendly congruent with this project, and improvements in breastfeeding rates may have been impacted by this outside variable. It was also difficult to describe what routine care would be because the participants did not all have the same provider or come from the same clinic. The final limitation was the short time frame of this project. Data was not collected past eight weeks postpartum, so comparison with Healthy People 2020 objectives was based on expected projections.

### Organization for the Remainder of Paper

The remainder of the paper will be organized according to the following format. First, an in depth presentation of the current literature on the topic will be presented. Second, the methods and data analysis will be addressed. Finally, the results of the project will be reported and followed by implications for practice.

## CHAPTER II

### LITERATURE REVIEW

A key component of providing breastfeeding education is understanding the benefits that breastfeeding can provide but also recognizing its limitations. It is also important to have a thorough grasp of the different factors that can impact breastfeeding duration and the best way to go about providing prenatal breastfeeding education.

A thorough search of the following databases was completed to compile an up to date review of the literature between 2005 and 2015: CINAHL, PsychINFO, MEDLINE, and PubMed. The following search terms and phrases were used individually and in combination: prenatal, education, lactation consultant, certified lactation counselor, breastfeeding, benefits, peer counselor, and duration. Only articles that were in English and had been peer reviewed were included.

#### Benefits of Breastfeeding

Breastfeeding has long been established as the optimal feeding method for infants due to the many benefits it can provide for both a mother and her child. In addition to the known physical and emotional benefits, breastfeeding has also been found to have a positive impact on society, especially with regards to potential financial gains.

#### Benefits for the Child

Stahl (2013), a lead researcher on human milk, highlighted some key benefits of breastfeeding for infants. These include experiencing less diarrhea, having fewer

infections, and potentially a reduced risk of developing allergies, obesity, high blood pressure, and high cholesterol. Some of these benefits are related to the unique properties of breast milk, such as the presence of certain bacteria that impact a breastfed infant's digestive system. The reduced risk of infection can be especially beneficial for premature infants, whose immune functions lag behind babies born at term (Godfrey & Meyers, 2009). Stahl (2013) also pointed out how breast milk content changes with a growing infant's needs.

A German study also found that exclusive breastfeeding cut the risk of sudden infant death syndrome in half, and partial breastfeeding showed a modest reduction of risk (Vennemann et al., 2009). The association of breastfeeding and reduced SIDS risk was confirmed by a meta-analysis, which also found a greater reduction of risk with exclusive breastfeeding, but any amount of breastfeeding was found to be protective (Hauck, Thompson, Tanabe, Moon, & Vennemann, 2011).

Dogaru, Nyffenegger, Pescatore, Spycher, and Kuehni (2014) conducted a systematic review and meta-analyses which found that breastfeeding was associated with a reduced risk of asthma, although this protection appeared to diminish after the child was two. It is worth noting, however, that a systematic review and meta-analysis by Tidswell and Langley-Evans (2011) found there to be no evidence that breastfeeding reduced the risk of allergic asthma, and it is possible that these opposing views were impacted by differences in how asthma was defined and measured within the studies examined.

A meta-analysis done by Horta, Loret de Mola, and Victora (2015a) found that the benefits of breastfeeding may be long lasting with regards to a reduced risk of type II diabetes and obesity, but they did not find any long-term breastfeeding benefits with regards to cholesterol levels or blood pressure. In a separate meta-analysis, Horta, Lret de Mola, and Victora (2015b) found that breastfeeding was related to higher IQ scores, and Reynolds, Hennessy, and Polek (2014) reported that breastfeeding was associated with improved mental well-being later in childhood.

While there are many studies that support the benefits of breastfeeding, some studies have led to an exaggerated expectation of the effects of breastfeeding on long-term child development. Jenkins and Foster (2014) analyzed the health and cognitive outcomes for over ten thousand children born in the United States in 2001. Their results showed that exclusively breastfeeding and breastfeeding duration had little or no effect on health markers, such as BMI or cognitive development, and this study is also supported by Colen and Ramey (2014) in their sibling comparison study. While these studies do not negate previous studies that explore immediate potential benefits, it does highlight the importance of healthcare professionals using caution when discussing the benefits of breastfeeding, especially with regards to long term gains. While it is a fine option for feeding infants, mothers who choose not to breastfeed should not be made to fear that their children will definitely suffer in the long term for not having been breastfed.

### Maternal Benefits

Breastfeeding mothers also may experience numerous benefits from breastfeeding, including well documented physiological and psychological benefits.

Physiological. Godfrey and Meyers (2009) discussed current evidence, and they pointed out that some of the advantages for the mother include a reduced risk of breast and ovarian cancer and diabetes. With regards to diabetes, Ziegler et al. (2012) conducted a study on women who had gestational diabetes, a known risk factor for later developing Type II diabetes, to see if breastfeeding influenced long-term outcomes. The women in the study were followed up to nineteen years postpartum, and it was discovered that breastfeeding for longer than three months reduced the risk of developing type II diabetes by forty percent. McClure, Catov, Ness, and Schwarz (2012) found in their research that mothers who breastfed had significantly less visceral adipose tissue, and this finding could provide a possible physiological basis for why breastfeeding helps to protect women against type II diabetes. Sharma, Dee, and Harden (2014) also reported that breastfeeding was especially beneficial for obese mothers in reducing their long term weight when compared to obese mothers who never breastfed. Other studies have found that breastfeeding may help prevent hypertension (Groer, Jevitt, Sahebzamani, Beckstead, & Keefe, 2013) and heart disease (Godfrey & Lawrence, 2010).

Psychological. In addition to physiological benefits, breastfeeding has been found to be associated with a decreased risk of postpartum depression (Godfrey & Lawrence, 2010; Hamdan & Tamim, 2012), lower stress levels (Goer et al., 2013), and enhanced

infant-maternal bonding (Kim et al., 2011). Similarly, Watkins, Meltzer-Brody, Zolnoun, and Stuebe (2011) found that mothers who experienced difficulty with breastfeeding in the early postpartum period were twice as likely to experience postpartum depression at two months.

The psychological benefits of breastfeeding are not just limited to parents with only biological children. Adoptive mothers and their babies can also enjoy the benefits of breastfeeding, which may help facilitate bonding between the mother and her new child. As Gribble (2006) pointed out, the emotional benefits can be especially important for children who were abused or neglected prior to adoption. Adoptive mothers reported that being able to comfort their child through breastfeeding was very important to them and made bonding easier (Gribble, 2006).

In addition to the known physical and psychological benefits, some women may perceive breastfeeding to be more beneficial because it is natural, convenient, cheap, and suppresses ovulation (Li & Qiu, 2007).

### Societal Benefits

Breastfeeding has been found to have benefits that reach beyond breastfeeding mothers and their children. Bartick and Reinhold (2010) conducted a cost analysis of pediatric diseases, and reported that “if 90% of US families could comply with the medical recommendations to breastfeed exclusively for 6 months, the United States could save \$13 billion/year and prevent an excess 911 deaths annually, 95% of which would be of infants” (p. 1052). Bartick et al. (2013) estimated that suboptimal breastfeeding with

regards to maternal health costs society over \$17 billion in premature deaths, over \$700 million in direct costs, and \$126 million from indirect morbidity costs.

### Factors that Impact Duration of Breastfeeding

There are many variables that can impact whether or not a mother is able to fulfill her breastfeeding goals, and it is important for healthcare providers to be aware of the barriers breastfeeding mothers may face. It is important to explore a mother's perceptions regarding breastfeeding, being sensitive to individual needs, as this can help healthcare professionals identify barriers that may be surmountable versus those that are not. A complete list of the following factors can be found in Appendix A.

#### Maternal Factors

Demographical Factors. There are numerous demographic factors associated with lower breastfeeding initiation rates and shorter breastfeeding durations. African-American mothers are less likely to initiate breastfeeding and have a shorter duration than any other race (Craighead & Elswick, 2014). White mothers are less likely to initiate breastfeeding when compared to other races, excluding African-American (Craighead & Elswick, 2014). Mothers who are less than 20 years of age, unmarried, have less than a high school education (Craighead & Elswick, 2014; Thulier & Mercer, 2009), participate in WIC (Hedberg, 2013), or have low socioeconomic status (Thulier & Mercer, 2009) are less likely to initiate breastfeeding and have shorter breastfeeding durations.

Biological Factors. Maternal biological factors that attribute to decreased rates of breastfeeding initiation and shorter breastfeeding durations include obesity, physical challenges with breastfeeding, method of delivery, parity, and insufficient milk supply, either real or perceived (Thulier & Mercer, 2009). Milk supply could be negatively impacted by maternal breast injuries or surgeries (Michalopoulos, 2007; Neifert, 1990).

With regards to parity, some research had found that breastfeeding duration increases with each child (Thulier & Mercer, 2009). However, Phillips, Brett, and Mendola (2011) analyzed the results of the 2002 National Survey of Family Growth for over two thousand mothers with at least two children, and they found that breastfeeding duration for the second child was the same as that of the first child in seventy percent of the women.

Method of delivery has also garnered significant interest due to its association with breastfeeding duration. Zanardo et al. (2010) validated the previous study by Semenic, Loiselle, and Gottlieb (2008) that method of delivery impacts duration. The authors examined the effect of having a caesarian section, either elective or emergent, on breastfeeding success from birth to six months. The researchers found that at six months after birth, 59% of mothers who gave birth vaginally were still breastfeeding exclusively versus 42.9% of those who had emergency C-sections, and 46.8% of those who had elective C-sections. Other studies have had mixed results or reported that method of delivery did not significantly impact breastfeeding initiation or duration (Watt et al., 2012). Method of delivery is often out of a mother's control, and healthcare providers

should keep in mind that mothers who gave birth via cesarean section may need additional support in order to reach their breastfeeding goals.

Pain during breastfeeding is a significant barrier, and healthcare providers can play a pivotal role in evaluating and resolving pain related to breastfeeding.

Unfortunately, there is little evidence that providers are meeting this demand. Strong (2011) analyzed 117 medical records of breastfeeding women in a southern OB/GYN practice and found that although breastfeeding pain was a common complaint, little was done for these women beyond prescribing pain medication. Healthcare providers need to be knowledgeable about current evidence based practice guidelines with regards to breastfeeding education, support, and management of obstacles so they are better prepared to meet the needs of their lactating patients. Haughton, Gregorio, and Pérez-Escamilla (2010) found in their survey of Connecticut WIC participants that nipple pain was one of the top three reasons why women decided to stop breastfeeding.

Social Factors. Numerous social factors have been found to impact breastfeeding initiation and duration. Work status, family support, professional support (Thulier & Mercer (2009), smoking status (Craighead & Elswick, 2014), and prenatal education class attendance (Semenic et al., 2008) also affect breastfeeding duration.

Mirkovic, Perrine, Scanlon, and Grummer-Strawn (2014) reported that mothers who returned to work full time within three months of giving birth were less likely to reach their breastfeeding goal despite their intention to breastfeed, and Ogbuanu, Glover, Probst, Hussey, and Liu (2011) and Johnston and Esposito (2007) also found that mothers who worked full time had decreased rates of breastfeeding initiation and shorter

breastfeeding durations. However, a supportive work environment can positively influence breastfeeding duration (Balkam, Cadwell, & Fein, 2011; Johnston & Esposito, 2007). In addition to work status, childcare provider attitudes can also impact a mother's decision to continue breastfeeding. Batan and Scanlon (2013) analyzed the Infant Feeding Practices Study II survey, and they reported that mothers who perceived their childcare provider as being supportive of their breastfeeding at three months were more likely to still be breastfeeding at six months.

Another social factor that could impact duration is religious service attendance. Burdette and Pilkauskas (2012) analyzed the data from two waves of the Fragile Families and Child Wellbeing Study, and they found that mothers who reported frequent religious service attendance were more likely to initiate breastfeeding than mothers who reported that they never attend religious services.

Psychological Factors. Maternal confidence, feeding intentions, and satisfaction with breastfeeding all can have an effect on how long a mother breastfeeds. Avery, Zimmermann, Underwood, and Magnus (2009) coined the phrase “confident commitment” as a key factor that impacts breastfeeding duration (p. 144). Their qualitative research involved 24 focus groups, and a key theme that emerged was that mothers who planned to breastfeed and were confident in their ability to do so prior to the birth of their child were more successful and able to overcome challenges with breastfeeding as they occurred. Avery, Zimmermann, Underwood, and Magnus (2009) observed that the majority of mothers desired to breastfeed, and cessation of breastfeeding was more of a reaction to perceived or actual breastfeeding difficulty rather

than a deliberate and planned choice. Scharfe (2012) also found that insecure mothers with attachment issues were more likely to give up on breastfeeding, possibly because they were not as effective at seeking out and using support when problems with breastfeeding occurred. Additionally, Mathews, Leerkes, Lovelady, and Labban (2014) stated that along with insecurity, mothers with elevated depressive symptoms are also less likely to initiate and sustain breastfeeding. Mothers who are satisfied with their breastfeeding experience tend to breastfeed for longer (Humenick, Hill, & Wilhelm, 1997). Hoetmer, Li, Vandenberg (2013) found that a prenatal intention to supplement with formula was related to a shorter overall breastfeeding duration.

Overall, breastfeeding duration can be influenced by a multitude of maternal factors, and it is important for healthcare providers to have an understanding of these variables so they can better assess the needs of their patients and provide appropriate interventions and education to their patients who wish to breastfeed.

### Hospital Factors

Hospital Practices. Hospital practices can play an important role in breastfeeding promotion and success. Bramson et al. (2010) reported that newborns who experienced skin-to-skin contact within the first three hours of life had higher rates of exclusive breastfeeding, and longer durations of skin-to-skin contact correlated with an increased likelihood that the mother would breastfeed exclusively while in the hospital. Hawkins, Stern, Baum, and Gillman (2014) found that hospitals certified as Baby-Friendly had better breastfeeding rates in certain groups than non-certified hospitals. To be certified as

Baby-Friendly, hospitals must comply with a rigorous set of breastfeeding promotion and support practices, and Hawkins, Stern, Baum, and Gillman (2014) also examined how compliant with Baby-Friendly regulations the hospitals in the study were. They found that hospitals were typically not in complete compliance with the required initiatives, but even partial compliance with Baby-Friendly regulations improved breastfeeding initiation rates in lower socioeconomic groups (Hawkins, Stern, Baum, & Gillman, 2014). In another study, Langellier, Chaparro, and Whaley (2012) found that mothers who breastfed their babies exclusively while in the hospital were eight times more likely to still be breastfeeding at twelve months than mothers who did not. They also found that mothers who were given formula from the hospital in their discharge packets were half as likely to still be exclusively breastfeeding at six months compared to the mothers who did not receive formula at discharge.

This research generates the suggestion that hospitals should implement practices that encourage and support mothers to breastfeed while in the hospital, and they should refrain from including formula samples in discharge packets. It also highlights the importance of adequately training staff to provide evidenced based care for breastfeeding mothers in the early postpartum period, especially with regards to promoting early skin-to-skin contact. Grossman et al. (2009) found that when hospital staff underwent intense training regarding breastfeeding education, the rate of exclusive breastfeeding increased for babies delivered at that hospital.

### Infant Factors

Breastfeeding duration is impacted by a myriad of factors, and while much attention is paid to maternal elements, infant-related factors are also important to consider.

Gestational Age at Birth. Craighead and Elswick (2014) conducted a retrospective cohort study and they found that infants born between 37 and 38 weeks were less likely to have breastfeeding initiated than infants born after 39 weeks.

Birth Weight. Flaherman, McKean, and Cabana (2013) reported that birth weight was strongly associated with exclusive breastfeeding at three months, and smaller babies were more likely to receive formula supplementation. While formula use in the hospital is typically associated with shorter breastfeeding durations (Langellier, Chaparro, & Whaley, 2012; Semenic et al., 2008), conversely, Flaherman et al. (2013) found that formula use for a limited time in infants who experienced high early weight loss may actually be beneficial in prolonging breastfeeding duration in the long term. Infants who were randomly assigned to receive ten milliliters of formula following breastfeeding until mature milk production began had higher rates of exclusive breastfeeding at three months compared to the control group whose mothers continued to attempt exclusive breastfeeding in the early weeks (Flaherman et al., 2013). This research is a reminder to providers to individualize care for newborns and their mothers and to consider the possibility that formula supplementation may be appropriate in certain circumstances, and its medicinal use should not be completely discounted in all situations.

Physical Characteristics. Infant physical characteristics, such as the presences of ankyloglossia, cleft palate, or some other congenital anomaly or physical disorder could certainly impact breastfeeding and make it more difficult or impossible (Mojab, 2000). The mothers of infants with special needs will very likely need additional support in order to breastfeed successfully, but the presence of a physical barrier should not automatically exclude the possibility of breastfeeding.

Pacifier Use. Kronborg and Vaeth (2009) explored the impact of pacifier use and breastfeeding technique as they related to breastfeeding problems and duration. They found that although breastfeeding technique is important to preventing problems that may shorten breastfeeding duration, it is not necessarily a good predictor of breastfeeding duration. Pacifier use, on the other hand, is related to shorter exclusive breastfeeding duration, and so Kronborg and Vaeth (2009) recommend that mothers who wish to breastfeed should avoid giving their babies pacifiers in their early weeks of life.

Early Introduction of Solid Foods. Research has found a link between the early introduction of solids and breastfeeding cessation. Grummer-Strawn, Scanlon, Fein (2008) analyzed the Infant Feeding Survey II and found that 70% of the infants who were fed solids at the age of four months had discontinued breastfeeding by six months, while only 34% of the infants who were not fed solids had discontinued breastfeeding by six months.

In general, there are fewer infant factors that impact breastfeeding duration when compared to maternal factors, and most are non-modifiable. Providers need to take into

account how the presence of risk factors such as prematurity and low birth weight may necessitate the need to provide the mother with additional breastfeeding support.

Providers can also take care to educate mothers about how early pacifier use and food introduction may have the unintended effect of shortening how long their baby breastfeeds.

### Predicting Duration

Research has helped to identify both modifiable and non-modifiable factors that can impact breastfeeding duration. The next step is translating this knowledge into practices that help women reach their breastfeeding goal. By understanding what factors play a role in breastfeeding duration, providers can begin to work on a plan to identify women at risk for early cessation of breastfeeding who may benefit from early breastfeeding education and interventions designed to help the mother meet her goal. The Breastfeeding Attrition Prediction Tool (BAPT) is a 5-point Likert scale developed by Janke (1991) using the Theory of Planned Behavior. The goal of the tool is to identify mothers at high risk for early cessation of breastfeeding. The BAPT has been used in numerous studies during both prenatal and postpartum periods. Gill, Reifsnider, Lucke, and Mann (2007) used a modified BAPT in their research during the prenatal period to identify mothers at high risk for early weaning, and they suggested that the modified BAPT could be an option for providers to use as a screening tool. Dick et al. (2002) used a modified BAPT early in the postpartum period, and their results found that the modified BAPT accurately predicted 78% of the women who weaned within eight weeks

postpartum and 68% of the women who were still breastfeeding. Evans, Dick, Lewallen, and Jeffrey (2004) discovered in their research that the modified BAPT was not predictive of breastfeeding duration, either when administered prenatally or postpartum, among women recruited at prenatal breastfeeding education classes. Evans et al. (2004) acknowledged that this could be due to the fact that this group of women were less likely to express negative thoughts regarding breastfeeding because they had already made a strong commitment to breastfeeding by independently signing up for prenatal classes. Conversely, Joshi, Trout, Aguirre, and Wilhelm (2014) found that mothers who breastfed for six months or longer had higher BAPT scores than mothers who stopped breastfeeding before six months.

### Breastfeeding Education

Healthcare providers can play an important role in providing breastfeeding mothers with education to help them meet their breastfeeding goals. Many studies have been conducted to explore various education techniques and their effectiveness on increasing breastfeeding duration. Recent legislation recognizes the importance of provider education and support in the hope of increasing breastfeeding rates. The Affordable Care Act requires that insurance companies cover “comprehensive lactation support and counseling, by a trained provider during pregnancy and/or in the postpartum period, and costs for renting breastfeeding equipment” (U.S Department of Health and Human Services, 2014, para. 5).

### Prenatal Breastfeeding Education

Numerous methods and their efficacy have been explored for providing breastfeeding education, but a systematic review of the topic revealed that there is no clear consensus about how and when prenatal breastfeeding education should be provided (Lumbiganon et al., 2012). Possibilities include prenatal interactive computer programs, group classes, educational pamphlets, consults with lactation experts, provider education, and peer support, and some studies show that there should be an increased emphasis placed on prenatal breastfeeding education for those mothers who have non-modifiable risk factors for shorter breastfeeding durations.

E-based Technologies. E-based technologies might be an especially useful means of providing prenatal breastfeeding education as supported by Pate's (2009) systematic review. One example of this type of education was explored by Edwards et al. (2013) when they developed an interactive computer agent designed to support breastfeeding during both the prenatal and postpartum periods. Similarly, Huang et al. (2007) had positive results with the use of an internet based prenatal breastfeeding education program on breastfeeding exclusivity.

Group Classes. Prenatal classes have been supported by numerous studies as a potential avenue to provide prenatal breastfeeding education. Rosen, Krueger, Carney, and Graham (2008) found that attendance at a prenatal breastfeeding class was correlated with an increased rate of breastfeeding at six months in a cohort study involving 194 mothers who had expressed a desire to breastfeed. This was supported by a small pilot

study by Schlickau and Wilson (2005), who discovered a trend that a culturally sensitive prenatal education session could prolong breastfeeding duration and by Noel-Weiss (2006) who found in an RCT that a prenatal group breastfeeding education workshop could positively impact exclusive breastfeeding rates.

Artieta-Pinedo et al. (2013) reported findings that agreed with Rosen, Krueger, Carney, and Graham (2008). These authors conducted a prospective cohort study on a sample of 614 mothers, and they found that mothers who did not attend any prenatal classes were three times more likely to quit breastfeeding in the first month compared to mothers who attended five or more classes. Mothers who attended one to four prenatal classes also showed modest improvements in breastfeeding duration. Interestingly, Artieta-Pinedo et al. (2013) noted that the benefits of taking prenatal classes did not extend beyond one month postpartum in this study. Overall, the research is clear that prenatal education is an important, yet most likely underutilized tool, in prolonging breastfeeding duration, and there are numerous ways that providers can incorporate these evidence based suggestions into practice.

Sandy, Anisfeld, and Ramirez (2009) conducted a randomized control trial on Latina immigrants in New York City, and they found that exposure to their prenatal intervention resulted in a statistically significant increase in exclusive breastfeeding in the first week postpartum compared to the control group. Their intervention involved at least one prenatal visit from a specially trained Family Support Worker, who provided in-depth breastfeeding education.

Some studies have recognized the need to target interventions towards women who have known risk factors to not meet their breastfeeding goals. For example, delivering via caesarian section is a known risk factor for having a shorter breastfeeding duration, but providing mothers with scheduled C-sections with prenatal breastfeeding education has been shown to help reduce the impact of this risk factor on breastfeeding duration (Lin, Kuo, Lin, & Chang, 2008).

Lactation Consultants. Similarly, Bass, Rogers, and Baker (2014) reported from a clinical trial that making a lactation consultant available within an obstetric office caused the rate of exclusive breastfeeding to increase from 33% to 60% over an eight month period.

Breastfeeding education and its long term benefits are not likely to be accomplished in one sitting, and there are numerous studies that have looked at the value of starting education prenatally and continuing for months after the baby is born, including a systematic review by Chung et al. (2008). Bonuck et al. (2014) found that prenatal and postnatal education from a lactation consultant increased breastfeeding exclusivity at three months postpartum. Participants in the test group received two prenatal visits, one hospital visit, and phone call during the postpartum period from the lactation consultant in addition to provider breastfeeding support. The authors also examined the impact of short provider directed breastfeeding education at five prenatal visits, and they found that this intervention also showed an increase in breastfeeding duration. However, the improvement was not as drastic as when the provider education was combined with the lactation consultant counseling. Bonuck et al.'s (2014) findings

have been replicated several times with various patient populations and risk factors, and the overall theme is that lactation consultants can be instrumental in providing prenatal breastfeeding education and improving duration (Duffy, Percival, & Kershaw, 1997; Carlsen et al., 2013; Gill, Reifsnider, & Lucke, 2007; Mattar et al., 2007).

However, there have also been several studies, including Kools et al. (2005), that have not found conclusive evidence that lactation consultation in the prenatal period are beneficial at prolonging breastfeeding. These studies however could simply act as reinforcement that breastfeeding education should be started in the prenatal period but should certainly continue well into the postpartum period. Mother's in a Maryland WIC program were interviewed about breastfeeding experiences and an overwhelming theme that emerged was the importance of education and support being consistently offered from prenatal visits until a child stops breastfeeding (Cross-Barnet, Augustyn, Gross, Resnik, & Paige, 2012).

Provider Based Interventions. Prenatal breastfeeding education has been recognized as an essential element of prenatal care by numerous national and world health organizations, including the United Nations Children's Fund (UNICEF) and the World Health Organization (WHO) (Baby-Friendly USA, Inc., 2010). UNICEF and WHO came together to develop the global Baby-Friendly Hospital Initiative (BFHI) to promote successful breastfeeding in hospitals and birthing centers. The following two guidelines from US Baby-Friendly Hospital Initiative include recommendations with regards to prenatal breastfeeding education in hospital affiliated clinics:

1. Education about breastfeeding, including individual counseling, should be made available to pregnant women for whom the facility or its associated clinics provide prenatal care. The education should begin in the first trimester, whenever possible. (Baby-Friendly USA, Inc., 2010, p. 9)
2. The education should cover the importance of exclusive breastfeeding, non-pharmacologic pain relief methods for labor, the importance of early skin-to-skin contact, early initiation of breastfeeding, rooming-in on a 24-hour basis, feeding on demand or baby-led feeding, frequent feeding to help assure optimal milk production, effective positioning and attachment, exclusive breastfeeding for the first six months, and that breastfeeding continues to be important after 6 months when other foods are given. Individualized education on the documented contraindications to breastfeeding and other special medical conditions should be given to pregnant women when indicated. (Baby-Friendly USA, Inc., 2010, p. 10)

Unfortunately, research has found that providers in general are not meeting the educational needs of breastfeeding mothers. Demirci et al. (2013) analyzed 172 prenatal visits and found that breastfeeding education was provided infrequently and only briefly, and nurse midwives were more likely to initiate breastfeeding discussion compared to residents. When breastfeeding education is provided, it may not be at all what the mother prefers or expects. Graffy and Taylor (2005) addressed the question of what mothers are looking for with regards to provider directed breastfeeding education in their qualitative study of mostly first-time mothers. They reported five main elements that mothers wanted: “information about breastfeeding and what to expect, practical help with positioning the baby to breastfeed, effective advice and suggestions, acknowledgment of mothers’ experiences and feelings, and reassurance and encouragement” (Graffy & Taylor, 2005, p. 179). In addition, Taveras et al. (2004) elaborated that there is a disconnect between the provider’s and mothers’ perspectives of breastfeeding education. In their prospective cohort study, the authors interviewed both mothers and their

providers and compared their responses. Several inconsistencies emerged such as how among the group of providers who reported that they “usually or always discuss breastfeeding duration at prenatal appointments” only 16% of the mothers corroborated that this occurred (Taveras et al., 2004, p. 408). Most of the providers said they discussed the mother’s plans to continue breastfeeding after returning to work, but only about half of the mothers reported this (Taveras et al., 2004). These findings are impacted by both the provider’s and the mother’s ability to recall, but they still suggest that there are significant communication gaps between the two. One suggestion that these studies generate is that providers become familiar with the educational needs of their patients and utilize educational techniques that have been shown to help patients remember information, such as the teach-back technique (White, Garbez, Carroll, Brinker, & Howie-Esquivel, 2013)

Chen, Johnson, and Rosenthal (2012) analyzed data from the Infant Feeding Practices Survey II, and they explored how providing mothers with education about breastfeeding and breast pumps impacted the length of time mothers exclusively breastfed their babies. The authors concluded a negative correlation existed between breastfeeding duration and education about breastfeeding and pump use from a physician or physician assistant; there was no correlation between education provided by other healthcare professionals. While the research was unable to explain this negative correlation, Chen, Johnson, and Rosenthal (2012) speculated that resource limitations and lack of education training for healthcare providers could be responsible for this unfortunate correlation. It is also possible that physicians and physician assistants tend to

only provide breastfeeding and breast pump education for mothers they have determined to be at risk for early cessation. The survey may not capture how successfully breastfeeding mothers do not elicit education from their provider. Conversely, Chen, Johnson, and Rosenthal (2012) found that education from social supports, such as from classes, support groups, family, or friends, was associated with longer breastfeeding duration. This finding was supported by Bevan and Brown (2014) in their systematic review of factors that promote exclusive breastfeeding. Perhaps education from healthcare providers can focus primarily on helping nursing mothers connect with social support groups, rather than attempting to provide breastfeeding education in the span of a short office visit.

The literature illustrates that new mothers increase their breastfeeding duration when connected to social support rather than their providers. McInerney and Langton (2012) reinforced the importance of education in promoting breastfeeding from both professionals and peers in their systematic review of qualitative studies. They described what women found the most helpful with regards to support. Having an “authentic presence,” allowing for sufficient time to interact, providing positive encouragement, avoiding critical mannerisms that may make a mother feel guilty, and having open interactions are all ways that can help facilitate a positive educational experience that is individualized and centered on the mother (McInerney & Langton, 2012, p. 134). This study emphasizes that it is especially important for healthcare workers to develop their communication skills because well-intentioned advice delivered in an abrasive manner can do more harm than good when it comes to supporting and educating a breastfeeding

mother. The research supports the need for social support and positive educational experiences, but it does not find providers to be the best resource to provide breastfeeding education. Referring patients to social networks or supports, including lactation consultants, could be the best direction for prenatal and postnatal breastfeeding education to take.

Peer Based Interventions. A promising avenue for providing mothers with breastfeeding support is utilizing community members to provide peer support. Research that looked at the effectiveness of peer counseling developed out of the need to find sustainable and affordable means of providing nursing mothers with support. Campbell, Wan, Speck, and Hartig (2014) examined data from the 2009 WIC Infant Feeding Practice Survey, and they found that women who reported interacting with a WIC peer counselor during the prenatal period, at the hospital, and postpartum were more likely to try breastfeeding compared to women who reported no such contact. This supported previous research by Olson et al. (2010) who found in their study of nearly a thousand WIC participants that breastfeeding support from a peer counselor significantly lengthened breastfeeding duration. Similarly, Shaw and Kaczorowski (1999), conducted a survey and chart review on nearly 300 WIC mothers in Tennessee. They found that mothers who were given peer counseling both prenatally and postpartum had increased breastfeeding initiation rates and breastfeeding duration compared to mothers in the control group. Morrow et al. (1999) reported on their randomized control trial involving a sample of 130 postpartum mothers in Mexico City. Sixty seven percent of the mothers who received six postpartum visits from a Le Leche League trained peer counselor were

still breastfeeding exclusively compared to 50% of the three visit group and 12% of the control group. Other research has also found that more breastfeeding education correlates to longer durations. The overall value of peer support in breastfeeding continuation was confirmed by Kaunonen, Hannula, and Tarkka (2012) in their systematic review and others (Rempel & Moore, 2012; Chung et al., 2008; Anderson et al., 2005). Hannula, Kaunonen, and Tarkka (2008) added that peer support is especially beneficial for mothers with low socioeconomic status.

### Summary

Breastfeeding provides numerous health benefits for both a mother and her infant, but many mothers still fall short of their breastfeeding goals. In order for health care providers to assist mothers, they must understand the complex and varied factors that impact breastfeeding duration. Physical, psychological, and social barriers do not need to be the reason a mother fails to reach her breastfeeding goal. Understanding what places a mother at risk for early weaning can help guide breastfeeding education practices, which should ideally begin during the prenatal period and continue well into the postpartum period. Certified lactation counselors are in a prime position to assist prenatal care providers in getting the mothers the help they need to be successful.

## CHAPTER III

## METHODS

Numerous studies have examined various prenatal education methods and their impact on breastfeeding duration. The main goal of this project was to help prenatal clinics implement successful methods into clinical practice. Research has found that one-to-one breastfeeding education from a lactation expert can improve breastfeeding duration and help mothers, especially first time mothers, reach their breastfeeding goals (Bass, Rogers, & Baker, 2014; Bonuck et al. 2014; Bonuck, Trombley, Freeman, & McKee, 2005).

Design

This project was a cohort study that utilized a randomized controlled trial design. Participants were randomly assigned to either the control group or the experimental group. Neither the primary investigator (PI) nor the lactation counselors were blinded with regard to which treatment group participants were in. However, the lactation counselors did not have access to the participants completed questionnaires or postpartum feeding data.

Setting and Sample Population

Participants for this project were recruited from two large OB/GYN clinics in the northwest United States. Both clinics served primarily middle class Caucasian women.

To be included in the study, participants must speak English, be 18 years or older, and have expressed a desire to breastfeed. Other factors that excluded participation included the chronic use of medications classified as L5 by Hale and Rowe (2014), multiple gestation, HIV-positive status, delivery prior to 37 weeks gestation, and maternal or infant factors that would preclude breastfeeding (infant congenital anomaly). Recruitment was limited to mothers with a due date on or before August 31, 2015.

Several studies have examined the effectiveness of prenatal breastfeeding education interventions on duration and have found statistically significant improvements with various sample sizes. Rosen et al. (2008) had 75 participants in their experimental group that received a one-time two hour prenatal group class with a certified lactation counselor, and they found that breastfeeding rates were significantly better in this group compared to the control group. Likewise, Sandy, Anisfeld, and Ramirez (2009) and Lin, Kuo, Lin, and Chang (2008) found a statistically significant improvement in exclusive postpartum breastfeeding rates in their studies with experimental groups consisting of 137 and 54 participants, respectively. The experimental groups in both studies received a prenatal breastfeeding education intervention. The sample size for this study was 55 with seven of the participants receiving the intervention.

#### IRB Approval

This study was approved by Montana State University's Institutional Review Board, and the complete letter can be found in Appendix B.

### Measures and Instruments

The Breastfeeding Attrition Prediction Tool (BAPT) is comprised of four subscales: positive breastfeeding sentiment, negative breastfeeding sentiment, support, and control. Just the ten questions of the breastfeeding control (BFC) section were used in this project. The BFC section of the BAPT was used to measure how likely a mother was to need additional support in order to meet her breastfeeding goals by quantifying a mother's perceived ability to be successful at breastfeeding; a low score indicated that she was at a higher risk to not reach her breastfeeding goal. The reliability of the BFC section was reported by Janke (1994) to have a Cronbach's alpha of 0.81, and the predictive validity was reported to be statistically significant for infant feeding at eight weeks with  $p = 0.017$ . A modified version of the BAPT was used in this study, and other studies have used modified versions of the BAPT as well with good reliability and validity (Gill, Reifsnider, Lucke, and Mann, 2007; Evans et al., 2005; Dick et al., 2002). Evans et al. (2004) reported a Cronbach alpha of 0.868 for the BFC section when the BAPT was administered prenatally, and similarly Dick et al. (2002) reported a Cronbach alpha of 0.864 for in hospital administration of the BFC. Gill et al. (2007) reduced the BFC section to seven questions, and reported that the Cronbach alpha was 0.82 when administered in the third trimester. Some research has found the BAPT tool is less effective when used to measure attrition in mothers who independently plan to take prenatal courses, but it was determined that eliminating all mothers who had attended or planned to attend a prenatal class would make the sample size too small in this study (Evans, Dick, Lewallen, & Jeffrey, 2004).

The full BAPT tool is 94 questions and time consuming to score, but the BFC section of the BAPT was a short and efficient means to quickly assess whether or not a mother may need further interventions to help her meet her breastfeeding goals. The author of the tool also reported that experience has shown the BFC section to be the most predictive scale in the tool. Each question uses a 6-point Likert type scale, and the BFC section was scored by summing all of the responses. The higher the score, the greater the sense of control a woman has about her ability to be successful at breastfeeding.

The Index of Breastfeeding Status (IBS) was used to measure breastfeeding intensity in the hospital and at eight weeks postpartum. The IBS is a 7-point ordinal scale that was developed by the Interagency Group for Breastfeeding to help standardize how breastfeeding intensity is measured in research. Mothers were asked to recall how their infant was fed in the last week, and give an IBS rating using the following scale: 1) 100% breast milk, 2) >80% breast milk, with <20% artificial milk or solids, 3) 50%-80% breast milk, 4) 50% breast milk, 5) 20%-50% breast milk, 6) <20% breast milk, and 7) 100% artificial milk and/or solids (Cadwell, 2002). Chart reviews were used to gather data on hospital IBS rates, delivery mode, and birth weight. The IBS was again used during follow-up interviews at eight weeks. All participants were initially contacted by phone, but participants had the option to request further correspondence to be done via text messaging or email.

Eight weeks was chosen as the point to do the postpartum interviews because Kronborg and Væth (2004) found that over half of the mothers who weaned before four months did so by five weeks postpartum, and other studies have also reported that the

majority of mothers who wean do so within eight weeks (Cooke, Sheehan, & Schmied, 2003; Lowe, 1988). With this in mind, eight weeks postpartum was chosen as the time for follow-up interviews with the assumption that breastfeeding would be well-established by eight weeks, and the majority of mothers who were going to wean early would have already done so.

### Procedures

All participation was voluntary, and participants could request to leave the project at any time. Participants were recruited by their provider's registered nurse (RN) or licensed practical nurse (LPN), who had all been trained on the project goals, methods, and recruitment criteria by the PI. If a woman met all of the inclusion criteria as determined by the provider's nurse and she agreed to participate, she signed an informed consent and was given a questionnaire to complete. The questionnaire included the BFC section from the BAPT, demographic data, and breastfeeding duration goal (see Appendix C). Questionnaires were given to the mothers to fill out in the exam room either before or after a scheduled prenatal appointment between 27 and 40 weeks. Upon completion, the participant placed the questionnaire into an envelope and sealed it. The sealed envelope with the questionnaire was deposited in a secure location by the RN or LPN. Participants were recruited over a four month period, and all of the completed questionnaires were kept in a secure area in each of the respective clinics. The questionnaires were collected by the PI each week during the recruitment phase, and collected questionnaires were randomly assigned by block randomization to either the

control group or the experimental group. The app Randomizer for Clinical Trial developed by MEDSHARING was used to randomly select one of the six possible combinations of assignment for each block. This was done as a continuous process in order to increase the likelihood that recruited mothers in the experimental group would receive the intervention before delivery.

Women in the experimental group had their name and phone number given to one of the four certified lactation counselors (CLC) involved with the study. A CLC contacted each of the participants to schedule one prenatal appointment, which would take place on the women and children's unit at the hospital. The PI also contacted mothers in the experimental group via text messaging or phone to give them the CLC contact information. The hospital was located within two blocks of each clinic. Participants were required to register at the hospital, but they were not charged for the counseling session. Each counselor was an RN who had at a minimum completed the 45-hour breastfeeding course. Three of the counselors were also International Board Certified Lactation Consultants (IBCLC). Each CLC was educated regarding the project aims, and they utilized a prenatal lactation assessment tool to guide each prenatal consult. The tool was compliant with the Baby-Friendly USA (2010) guideline requirements for prenatal breast education which states the following:

The education should cover the importance of exclusive breastfeeding, non-pharmacologic pain relief methods for labor, the importance of early skin-to-skin contact, early initiation of breastfeeding, rooming-in on a 24-hour basis, feeding on demand or baby-led feeding, frequent feeding to help assure optimal milk production, effective positioning and attachment, exclusive breastfeeding for the first six months, and that breastfeeding continues to be important after 6 months when other foods are given. Individualized education on the documented contraindications to

breastfeeding and other special medical conditions should be given to pregnant women when indicated. (Baby-Friendly USA, Inc., 2010, p. 10)

The CLCs charted on each encounter in the hospital system. Charts were reviewed to ensure content consistency.

Both the experimental and control group participants received routine care. Participants were not limited in their choice of a prenatal care provider, seeking breastfeeding support or education before or after delivery, or any aspect of their prenatal care. Therefore, routine care was essentially defined by each mother. The CLC intervention in the experimental group was in addition to routine care. Within a few months of the study beginning all of the prenatal care providers had completed three hours of breastfeeding continuing education and their nurses had completed five.

Breastfeeding initiation rates, breastfeeding intensity according to the IBS, birth weight, and delivery mode were gathered by hospital chart reviews from both the experimental and control groups once the baby was born. IBS rate was collected via phone interviews and email interviews at eight weeks postpartum. The follow-up interview also included asking mothers whether they had met their breastfeeding goal or were on track to meet their goal as they perceived it to currently be, reasons they did or did not attend a consult if assigned to the experimental group, whether or not their insurance covered prenatal lactation services and whether or not they would use such a benefit, and if they could think of anything that might have helped them reach their breastfeeding goals. Mothers who gave an IBS rate of seven were also asked if they had tried breastfeeding and if so, how many weeks old their infant was when they weaned. Refer to Appendix D for a complete list of follow-up questions. All phone interviews and

email correspondence were conducted by the PI. The PI attempted to contact all of the participants in both the control and experimental groups at eight weeks postpartum.

### Data Analysis

All data was entered into Microsoft Excel, and descriptive statistics were used to represent the demographic data on the participants. Data was analyzed by observing plots and trends. The responses to open-ended questions that were asked on the questionnaire and in the follow-up interviews were analyzed by using Giorgi's Method. This method involves reading all of the responses to get a sense of the whole data set, rereading the set to develop "meaning units or themes," looking for recurrent themes, reflecting on the themes, and developing a consistent description of the themes and what they say about the participants as a group (Fain, 1999, p. 230).

## CHAPTER IV

## RESULTS

A total of 56 participants were recruited for the study, and 44 participants completed the study, with one participant officially leaving the study. Only mothers who indicated an intent to breastfeed were recruited. Among those 44 participants, 19 finished the complete study protocol by answering all of the questions on the questionnaire that were used to compare the experimental group and the control group, receiving their assigned intervention, and being successfully contacted for the eight week postpartum follow-up interview; 14 participants were in the control group and five participants were in the experimental group. Only those who met the complete study protocol were used to compare the experimental group and the control group. Variables measured were: BAPT score, IBS rate, age, education, initial breastfeeding goal, previous breastfeeding experience, WIC status, relationship status, race, delivery mode, gender of the baby, birth weight, and gestational age. These variables were chosen due to their potential to impact a woman's breastfeeding success.

Due to the small sample size, plots were used to visualize the similarities between the experimental group and the control group. The experimental and control group participants were similar in their BAPT scores. The average BAPT score was 46 for the experimental group and 48.07 for the control group, so those in the control group were slightly more likely to meet their breastfeeding goals. The mean scores for individual BAPT questions can be found in Appendix E. All of the 19 participants from both groups

had an IBS rate of one in the hospital, which means they breastfed 100% of the time while in the hospital. They were also similar in age with all of the mothers being between 18 and 35, with the exception of one mother who was 42. Education levels were similar. Twenty percent of the mothers in the experimental group and 21.4% in the control group had C-sections.

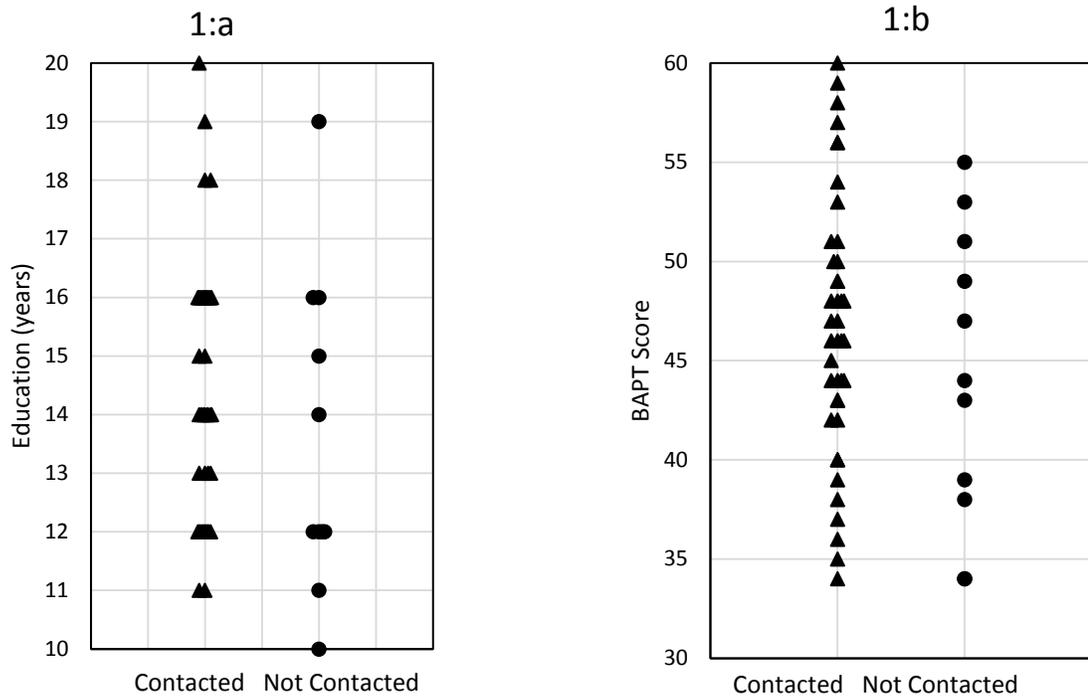
Among the babies of the participants, 64.3% in the control group were males and 80% in the experimental group were males. Birth weights and gestational ages at delivery were similar. All of the babies were born after 38 weeks gestation, and none were small for gestational age. All of the babies were discharged from the hospital within six days of delivery. None of the babies had significant congenital abnormalities.

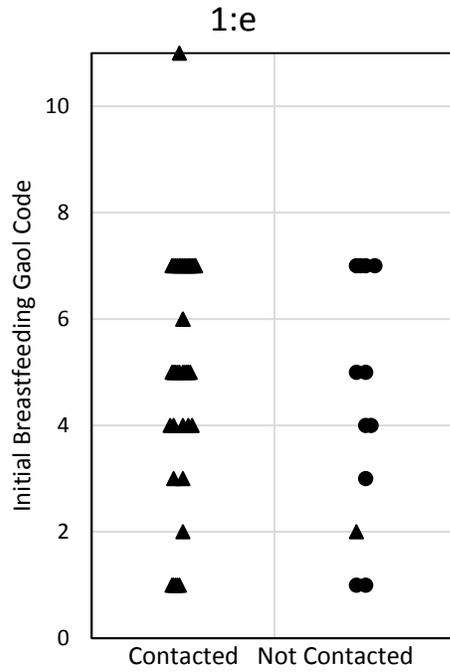
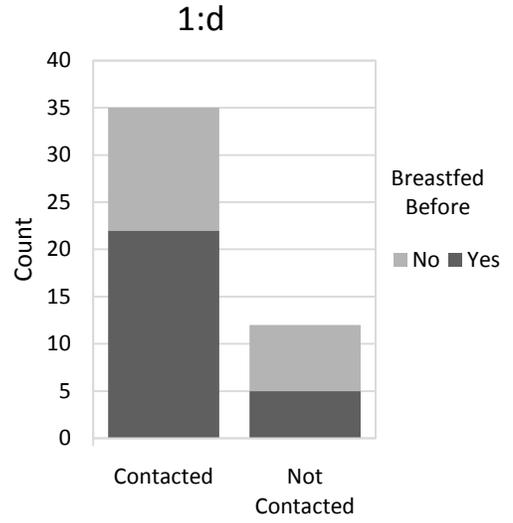
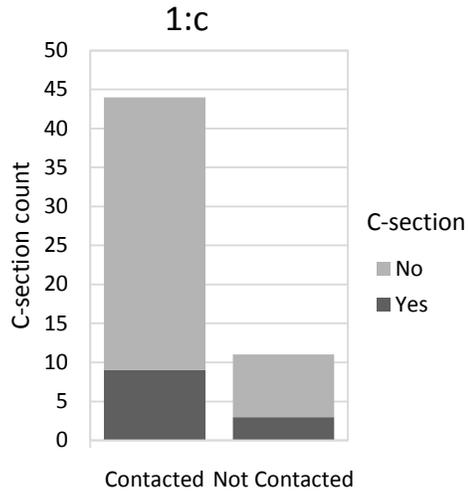
One key difference between the groups was that 85.7% of the mothers in the control group had breastfed before while only 20% of the mothers in the experimental group reported previous breastfeeding experience, and this may account for the slightly higher BAPT scores in the control group. Appendix F provides a table of participant characteristics, and Appendix G includes plots and graphs for the characteristics of each group.

#### Differences between Participants Contacted at Eight Weeks Postpartum versus Not

The researchers were also interested in whether or not there were any significant differences between the mothers who were contacted at eight weeks postpartum versus the mothers who could not be reached, regardless of which group they were assigned to. Any differences could potentially enlighten a hypothesis about why mothers could not be

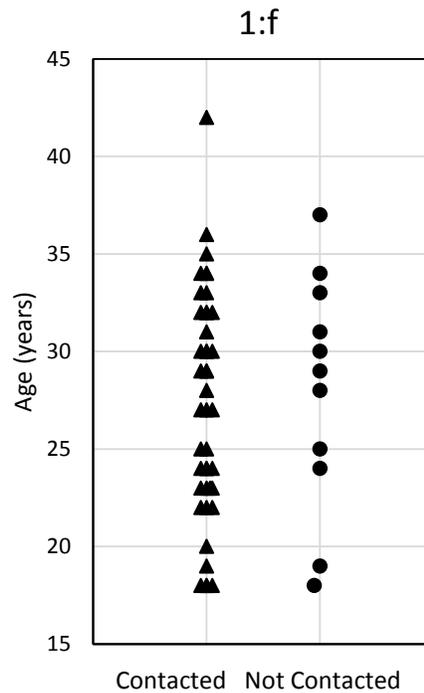
reached. However, those contacted versus those not, appear in plots to be very similar with regards to age, education level, BAPT scores, mode of delivery, previous breastfeeding experience, and initial breastfeeding goals, with the exception of one mother who was contacted at eight weeks and reported an initial breastfeeding goal of two years. All other participants had an initial breastfeeding goal of 15 months or less. With this in mind, the data does not suggest that any particular variable had an associate with the researcher's ability to contact a mother for the eight week follow-up interview. Figures 1: a-f illustrate the different variables between the mothers who were contacted at eight weeks versus those who were not.





**Breastfeeding Goal Code (Key)**

- Unsure = 1
- As long as possible = 2
- <3 months = 3
- 3 to < 6 months = 4
- 6 to < 9 months = 5
- 9 to < 12 months = 6
- 12 to < 15 months = 7
- 15 to < 18 months = 8
- 18 to < 21 months = 9
- 21 to < 24 months = 10
- ≥ 24 months = 11



Figures 1: a-f. Characteristics of Participants Contacted vs. Not Contacted.

### BAPT and IBS Score at Eight Weeks Postpartum

BAPT scores and IBS scores at eight weeks were compared between the completely adherent experimental group and control group, and the plot in Figure 2 reveals that the experimental and control groups had similar patterns in BAPT scores and IBS rates at eight weeks. However, there does appear to be a slight trend between low BAPT scores and high IBS scores, regardless of the intervention. Two of the participants were at high risk to not meet their breastfeeding goals because their BAPT score was less than 40, and neither of these two were breastfeeding exclusively at eight week. With both groups combined, the mean BAPT score of the participants breastfeeding 100% of the time at the eight week follow-up interview was 49.15, and the mean BAPT score of

participants not breastfeeding at 100% at the eight week follow up was 44. In other words, women who reported low BAPT scores tended to be breastfeeding less at eight weeks when compared with mothers who scored very high on the BAPT, regardless of whether they were in the experimental group or the control group. This finding would be consistent with the expectation that the BAPT is a helpful tool for predicting breastfeeding success.

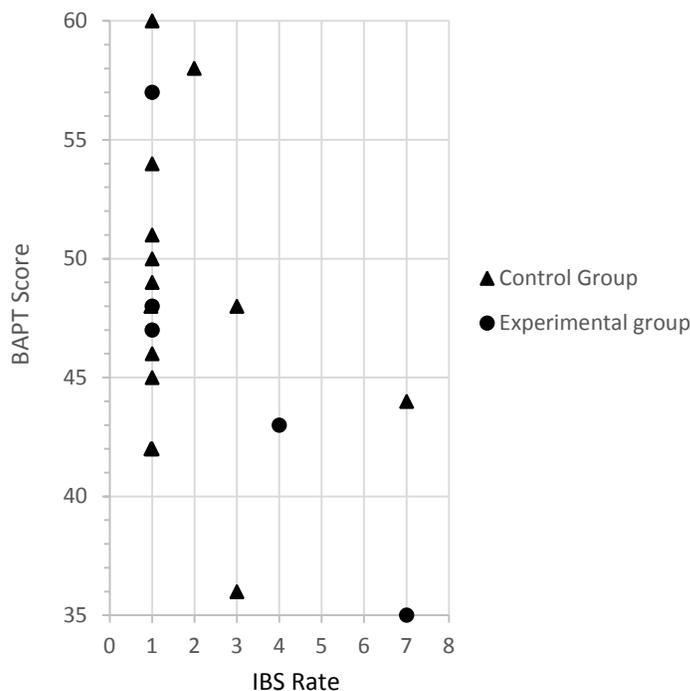


Figure 2. BAPT Scores and IBS Rates at Eight Weeks.

### Meeting Breastfeeding Goals

It is worth noting that most of the women in both groups who completed the full study protocol reported having met their breastfeeding goal at eight weeks, regardless of

IBS score, with only one participant in the experimental group reporting that she did not meet her goal.

However, it is important to consider that a woman's breastfeeding goal may have changed from the time of the initial questionnaire to the eight week postpartum interview. Among all of the participants who reported both their initial breastfeeding goal and their breastfeeding goal at eight weeks postpartum, 60% reported that their eight week breastfeeding goal was the same or shorter than their initial goal, 23% reported a longer breastfeeding goal at eight weeks, and 17% reported vague initial or eight week goals such as "unsure" or "as long as possible." This indicates that breastfeeding goals are not necessarily stable and may change. Mothers were asked in the follow up interview whether or not they had met their breastfeeding goal as they perceived it to be at the time of the interview, and this goal may or may not match what they originally identified as their breastfeeding goal while they were still pregnant. The researchers chose to allow mother's to adjust their goals because this was felt to more accurately capture the subjective nature of whether or not a goal was met. Asking mothers whether or not they met their original breastfeeding goal would perhaps discount a mother's perception that she did in fact meet her breastfeeding goal, even if it changed.

#### Study Breastfeeding Rates Compared to Healthy People 2020

Exclusive breastfeeding rates were compared to the Healthy People 2020 objectives. Forty-four mothers responded to the eight week postpartum interview questions of what their current IBS score is, and 24 of those mothers reported an IBS

score of 1 (100% breastmilk). This result that 54.5% of the participants were exclusively breastfeeding at eight weeks postpartum is similar to CDC data that reports exclusive Montana breastfeeding rates at three months postpartum to currently be over 53%. The exclusive breastfeeding goal at three months set by Healthy People 2020 is 46.2% (CDC, 2014). Among the 19 mothers who finished the complete study protocol, the exclusive breastfeeding rate was even higher with 60% of experimental group mothers and 71.4% of control group mother exclusively breastfeeding at eight weeks postpartum.

The small sample size could account for why such a large difference exists between the mothers who finished the complete study protocol and the entire sample, which includes mothers who may not have answered all of the study questions. However, the rates of exclusive breastfeeding among mothers with incomplete versus complete study protocol participation both indicate that Montana would most likely exceed the Healthy People 2020 goal for exclusive breastfeeding at three months. However, this is only a projection because data was gathered at eight weeks postpartum for this study and the Healthy People 2020 goals is set for breastfeeding rates at three months.

#### Importance of Intervention Timing

The researchers hypothesized that the timing of the intervention would impact the effectiveness of the intervention or the likelihood that a mother would schedule the intervention if assigned to the experimental group. However, the plots, which include non-adherent participants as well and can be found in Appendix H, do not demonstrate that mothers who were contacted to schedule a lactation consult sooner after filling out the questionnaire were more likely to attend a consult. The plots also did not show that

mothers who had a consult sooner after being contacted breastfed with greater intensity at eight weeks. However, one of the plots showed a slight trend that those who had consultation closer to filling out the questionnaire were breastfeeding less at the eight week interview. Overall, it does not appear to matter how quickly the lactation consultants contacted mothers to schedule their consult or how close in time the consult was from initial contact, and the slight negative trend could be the result of a very small sample size.

### Qualitative Results

Participants were asked several open-ended questions in the questionnaire and during the eight week postpartum follow-up interview. The questionnaire asked women to list the main reasons they were planning to breastfeed, and women were asked in the follow-up interview the reasons they did or did not attend a consult if assigned to the experimental group, whether or not their insurance covered prenatal lactation services and whether or not they would use such a benefit, and finally, if they could think of anything that might have helped them reach their breastfeeding goals.

#### Themes Regarding Reasons to Breastfeed

The vast majority of the participants listed two or more main reasons to breastfeed, and there were numerous common themes that occurred in the list of reasons. Appendix I provides percentages of participants who listed a theme in their reasons to breastfeed.

Healthy for Baby. The strongest theme throughout all of the participant responses was that breastfeeding was healthy for the baby. Women used different short phrases to describe their perception that breastfeeding is healthy for the baby such as: healthiest for baby, healthy for baby, health benefits, better for immune system, more nutrition for baby, baby's brain development, prevents SIDS, etc. Some moms were very specific about the health benefits they believed breastfeeding provides, and other mother moms simply listed "healthy" as their main reason to breastfeed. It is also very possible that mothers who listed reasons such as "better for baby" or "good for baby" would include health benefits within that reason.

Healthy for Mom. Some mothers specifically identified maternal health benefits as a reason to breastfeed, such as "prevents and helps engorgement" and "helps lose baby weight." It is also possible that mothers who listed only the phrase "healthy" intended the mother to be included within this phrase and not just the baby.

Cost. Nearly half of the mothers surveyed listed cost as a reason to breastfeed, and common phrases included: cost, cheaper, and cheap.

Social. Numerous women also cited social reasons to breastfeed, such as they have friends who breastfeed, they were breastfed, or they have already breastfed other children. Bonding was also frequently mentioned as a reason to breastfeed.

Natural. The phrase "natural" came up numerous times with nine mothers including it in their list of reasons.

Themes for Attending or Not  
Attending a Prenatal Lactation Consult

The main themes among mothers who did attend a prenatal consult were that they wanted the extra support and education. Among the mothers who did not go to a prenatal consult, they most commonly cited the reasons that they did not feel it was necessary or they did not have time. Some mothers specified other support sources that contributed to them feeling like the consult was unnecessary. Only a few moms reported not going because they delivered before they could make it to the intervention.

Themes about Insurance  
Coverage of Prenatal Lactation Benefits

Only three mothers interviewed at eight weeks postpartum could say with certainty that their insurance does cover prenatal lactation services, and the vast majority of women reported that they were unsure or did not know. Most of the women stated that they would use prenatal lactation counseling services if it was covered by insurance. Thus, it appears that there is a significant knowledge deficit regarding this benefit and its availability.

Themes about What Would  
Have Helped Breastfeeding

Responses about what would have helped mothers reach their breastfeeding goal were varied. Numerous mothers could not think of anything. Several women mentioned that they would have liked to have had help increasing their supply, and many moms in both the experimental and control groups stated that it would have been helpful to see a lactation consultant. Other responses included having a place to pump, more resources,

eating healthy, having support, and rearranging work and school schedules to better accommodate breastfeeding. One mother when asked this question was not able to give specific ideas but instead expressed her frustration for not meeting her breastfeeding goal when she stated:

Nothing prepares you for how hard it can be. Breastfeeding was the hardest part of my entire pregnancy process. I remember people saying it could be difficult, but in no way was I prepared for how difficult it actually was. It seems like it should be such a natural easy thing. My little guy could not latch. He had a slight tongue restriction and ended up losing too much weight. We also experienced a death in the family a week after he was born and the combination of the stress from everything didn't help with my milk production, no matter how often I pumped. I didn't make enough and we had to switch him to formula so he could thrive. I am devastated that I wasn't able to achieve my goal to breastfeed my son. It is especially hard when he is having difficulty with formula. We are trying our 3rd kind now, and I feel like I failed him even though I know I did everything in my power (Personal communication, October 2015).

In summary, there was not common theme regarding what would have helped mothers meet their breastfeeding goals.

Overall, the small sample size of the study made it difficult to analyze the data and draw conclusions, and there were also numerous other limitations that impacted the results of this study.

### Project Goals

As previously articulated, the main goal of this project was to implement a sustainable protocol for prenatal care providers to use in order to facilitate prenatal breastfeeding education and increase the proportion of mothers who successfully reach

their breastfeeding goals. The five main project objectives are discussed in light of the project results.

#### Increasing the Rate of Breastfeeding Initiation at Birth

Among the fifty-five participants, all except one initiated breastfeeding while in the hospital, and 100% of the participants who finished the complete study protocol initiated breastfeeding. Initiation of breastfeeding does not imply that formula was not introduced at some point in the hospital stay, but it does indicate that mothers who expressed a desire to breastfeed prenatally were serious about at least trying to breastfeed while in the hospital. The Healthy People 2020 goal is that 81.9% of infants will have received some breastmilk (CDC, 2014). This study's participants far surpassed this goal.

Healthy People 2020 also includes the goal that 14.2% or less of all infants will receive formula supplementation in the first two days of life (CDC, 2014). Again, this study group exceeds this goal with only four of the fifty-five infants in the study being given formula while in the hospital, and none of the mothers who completed the full study protocol gave their infants formula in the hospital. In other words, only 7.3% of the infants in this study received formula while in the hospital, which is much less than the 14.2% goal.

### Increasing the Rate of Exclusive Breastfeeding at Eight Weeks Postpartum

Among the mothers who finished the complete study protocol, 60% in the experimental group and 71.4% in the control group were breastfeeding exclusively at eight weeks postpartum. If all of the mothers in the study are included, even those with incomplete participation, the percentage of exclusive breastfeeding is 54.5%. There did not appear to be any difference between the mothers in the control group versus the mothers in the experimental group with regards to exclusive breastfeeding rates, so it cannot be said definitively that the intervention improved exclusive breastfeeding rates. However, the small sample size made it difficult to draw conclusions, so this study neither supports nor discourages the use of lactation counselors in providing prenatal breastfeeding education in order to improve exclusive breastfeeding rates. A larger sample size would be helpful to add clarity to whether or not this intervention is useful.

### Increasing the Proportion of Women who Meet their Breastfeeding Goals

Within the mothers who finished the full study protocol, all of the mothers in the control group and all but one of the mothers in the experimental group reported having met their breastfeeding goal. The only mother who did not meet her goal received the intervention, so it cannot be ruled out that the receiving the intervention could be a factor for not meeting breastfeeding goals. However, the small sample size again limits the conclusions that can be drawn from the data. One participant who did not meet her goal despite having gone to the intervention does not negate the possibility that the intervention could be helpful to some women, but it does highlight the importance of

understanding that no intervention aimed at helping women meet their breastfeeding goals is going to have complete effectiveness for all women.

### Identify a Screening Tool

Prenatal care providers need a way to help them decide which of their patients may need additional support to meet their breastfeeding goal, and they must also have an understanding that there will most likely be limited availability with regards to outside resources that can offer individualized prenatal breastfeeding education. With this in mind, having a reliable screening tool can help to ensure that the highest risk patients are being identified, and this study did show that a low score on the BAPT control section correlated with less breastfeeding at eight weeks. The simplicity and ease of this tool make it an ideal screening tool to introduce into practice.

### Develop a Sustainable Referral Process

This project could be seen as an illuminating initial test of a process, but it did not quite achieve a permanent and sustainable referral process within the two participating clinics. Participation with the referral process was severely lacking in the experimental group, so it would be worth redesigning this process with the hope of increasing participation. Perhaps there needs to be more education about the purpose of the referral, and perhaps it would have better success if discussion about the referral was initiated by the provider. Despite failing to meet this final goal, the project did overall accomplish most of its key objectives.

### Limitations

This study had several limitations that may have impacted the results and the researcher's ability to draw conclusions. Most notably was the small sample size, and the fact that only six women assigned to the experimental group received the prenatal breastfeeding education intervention. This was partially impacted by the small local population, the short recruitment window of the study, and the difficulty the lactation counselors had in reaching women in the experimental group to schedule a consult. It could also be related to some women not understanding that the intervention was to take place during the prenatal period, and this misunderstanding was apparent in several eight week follow-up interviews.

Another limitation is that the PI had to rely heavily on the assistance of the clinic nurses in recruiting patients, and there was no way to completely ensure that all of the nurses were adhering to the study protocol. Participants were not randomized while they were still at the clinic, so the nurses were unable to provide further instruction to them about the study process. For example, mothers in the experimental group did not find out they were in that group until they were contacted by the PI or lactation counselors to schedule an appointment. The recruitment process also made it difficult to keep an accurate tally of how many eligible women declined to participate in the study.

The final limitation is that the area where this study took place already had breastfeeding rates well above the national average, so it may be more difficult to elicit a significant improvement with breastfeeding intensity with an intervention in a population that already has high rates of breastfeeding intensity.

It is important to note, the local hospital was in the process of becoming Baby Friendly Certified at the time of the study. One of the requirements for Baby Friendly certification is that all obstetricians, midwives, and pediatricians undergo three hours of intense breastfeeding education. This could have resulted in a sudden shift in how they run their practices, and some of the plots may have reflected changes in practice.

This study was of one small patient population in a small northwest town, so the findings will only be applicable to a very specific population. The generalizability of the results are very limited by the location of the study and the small sample size.

## CHAPTER V

## DISCUSSION

Supporting women to help them reach their breastfeeding goals should be a priority among healthcare workers because of the many benefits that breastfeeding provides for both the mother and her nursing infant.

BAPT Control Section as a Screening Tool

The small sample size of this study limits the strength of the results, but using the BAPT control section as a screening tool could be an effective means to identify mothers at high risk to not meet their breastfeeding goal. The BAPT control accomplishes this by quantifying a mother's perceived ability to be successful at breastfeeding. Primary prenatal care providers have the difficult task of educating their patients on a variety of pertinent topics, and finding time to include thorough prenatal breastfeeding education is a significant barrier. Utilizing a team approach to providing this education may help alleviate the burden, but providers need a way to systematically decide which of their patients may need additional support in order to reach their breastfeeding goals. The BAPT control section is a short and effective tool for providers to use to help guide their referrals to lactation experts.

Effectiveness of One-to-One  
Prenatal Breastfeeding Education

While the results of this study were unable to report conclusively that one-to-one prenatal breastfeeding education helps promote breastfeeding duration and intensity, this intervention may still be a valuable tool to assist women in meeting their breastfeeding goals. The majority of mothers interviewed at eight weeks postpartum reported that they would use prenatal lactation services if it was covered by insurance, so there is a general sense that prenatal breastfeeding education does have value for women. One possible method to help improve this knowledge deficit would be for nurses and providers at prenatal care clinics to specifically encourage their patients to contact their insurance companies during the prenatal period to identify what lactation benefits are covered by their insurance providers. This education could be included as part of their routine prenatal education.

Recommendation for Future Study

First, the lack of response among the mothers assigned to receive the prenatal intervention could indicate several considerations. It would appear that even though mothers report interest in prenatal breastfeeding education, it remains a low priority for most women, even those who appear to be at very high risk to not meet their goal. This study had the clinic nurses recruiting participants, but perhaps the nurses are not the best healthcare professionals to encourage women to schedule a referral appointment. Further studies should explore whether women are more likely to attend a prenatal breastfeeding

education referral if their prenatal care provider suggested it versus their provider's nurse. It could also be possible that the lack of participation in the intervention among the experimental group was related to a poor understanding of the study expectations. Future studies should ensure that their design allows for the opportunity for the clinic nurses or the providers to give additional education about the referral and the potential advantages of attending a one-to-one prenatal consult with a lactation expert.

Second, this study highlighted the necessity of a prenatal clinic interested in incorporating translational research into their practice of having a sustainable protocol in place. It may be better to have data gathered over a much longer period and to also utilize a structure that could operate independently without the need of an outside researcher. For example, a different method of determining the usefulness of the BAPT control section as a screening tool in a new referral process could include three key elements. First, a clinic gathers baseline postpartum breastfeeding rates using the IBS scale at six week postpartum visits. Second, the clinic implements the screening process using the BAPT control section, and refers only those mothers indicated as high risk to not meet their breastfeeding goals. Last, the clinic continues to gather data regarding breastfeeding intensity at the six week postpartum visits. Breastfeeding intensity data after the referral process was initiated could be compared to the baselined data gathered in order to determine whether or not the screening and referral process is effective at helping mothers reach their breastfeeding goals. Such a protocol would be more sustainable than relying on a team of researchers.

Third, this study set 40 as the cutoff score of the BAPT control section for being considered at high risk to not meet breastfeeding goals, but there has not been any research to determine what the best cutoff score should be. The average BAPT score for mothers who were not exclusively breastfeeding at eight weeks was 44, so perhaps 45 would be a better score to use. It would be helpful if further research could be done to answer this question with greater clarity about where the cutoff score should be in order to provide better guidelines for how to use the BAPT as a screening tool in practice.

The results of this study indicated that the actual referral appointment did not necessarily need to take place shortly after it was recommended. However, having no clear timeline guidelines may make it more difficult for clinics to follow-up on women sent for referrals. It would be helpful for future studies to further consider the question of where in the prenatal period referrals should be initiated. Overall, it will take perseverance and collaboration to shift current prenatal breastfeeding education practices to reflect the best evidence, but making this a priority can have far reaching positive impacts for women and their children.

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APPENDICES

APPENDIX A

FACTORS RELATED TO BREASTFEEDING DURATION

Table 1

*Factors Related to Breastfeeding Duration*

	Maternal	Infant
Demographical	Race Age Marital status Education level Socioeconomic status WIC participation	
Biological	Obesity Insufficient milk supply Physical challenges Method of delivery Parity Pain	Gestational age at birth Birth weight Physical deformities
Social	Work status Family support Professional support Smoking status Daycare support	Pacifier use Early intro to solid foods Early skin-to-skin
Psychological	Maternal confidence Feeding intentions Breastfeeding satisfaction Mental health	
Hospital	Breastfeeding in hospital Baby Friendly certification	Given formula

APPENDIX B

IRB APPROVAL LETTER



**INSTITUTIONAL REVIEW BOARD**  
**For the Protection of Human Subjects**  
**FWA 0000165**

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 c/o Immunology & Infectious Diseases  
 Montana State University  
 Bozeman, MT 59718  
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 406-994-5721  
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*Administrator:*  
 Cheryl Johnson  
 406-994-6783  
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**MEMORANDUM**  
 .....

**TO:** Jessica Havens and Maria Wines

**FROM:** Mark Quinn *Mark Quinn cy*  
 Chair, Institutional Review Board for the Protection of Human Subjects

**DATE:** March 31, 2015

**SUBJECT:** "Prenatal Lactation Counselor Effect on Breastfeeding Duration for Mothers at Risk for Early Weaning" [JH033115-FC]

The above proposal was reviewed by expedited review by the Institutional Review Board. This proposal is now approved for a period of one-year.

Please keep track of the number of subjects who participate in the study and of any unexpected or adverse consequences of the research. If there are any adverse consequences, please report them to the committee as soon as possible. If there are serious adverse consequences, please suspend the research until the situation has been reviewed by the Institutional Review Board.

Any changes in the human subjects' aspects of the research should be approved by the committee before they are implemented.

It is the investigator's responsibility to inform subjects about the risks and benefits of the research. Although the subject's signing of the consent form, documents this process, you, as the investigator should be sure that the subject understands it. Please remember that subjects should receive a copy of the consent form and that you should keep a signed copy for your records.

In one year, you will be sent a questionnaire asking for information about the progress of the research. The information that you provide will be used to determine whether the committee will give continuing approval for another year. If the research is still in progress in **3 years**, a complete new application will be required.

APPENDIX C

QUESTIONNAIRE

Participation is voluntary. You can choose to not answer any question that you do not want to answer, and you can stop at any time.

**PLEASE INDICATE THE DEGREE TO WHICH YOU AGREE OR DISAGREE WITH THE FOLLOWING STATEMENTS.**

BAPT Control Section (10 questions)

**PLEASE CIRCLE THE CORRECT ANSWER OR FILL IN THE BLANKS FOR THE FOLLOWING QUESTIONS:**

Contact information:

Name: \_\_\_\_\_ Home phone number: \_\_\_\_\_

Cell phone number: \_\_\_\_\_

11. How long do you intend to breastfeed (# of months)? \_\_\_\_\_
  
12. When did you decide you were going to breastfeed?
  - a. Before you became pregnant
  - b. During the first three months of your pregnancy (1st trimester)
  - c. During the middle three months of your pregnancy (2nd trimester)
  - d. During the last three months of your pregnancy (3rd trimester)
  
13. What was the main reason(s) you chose to breastfeed? (list as many reasons that apply)  
\_\_\_\_\_  
\_\_\_\_\_
  
14. What is your due date (month/day/year): \_\_\_\_\_
  
15. Will you have a scheduled C-section?
  - a. Yes
  - b. No
  
16. Have you attended any prenatal education classes?
  - a. Yes
  - b. No
  
17. Do you plan to attend any prenatal education classes?
  - a. Yes
  - b. No
  
18. Have you ever breastfed before?
  - a. Yes **(if yes, proceed to question #19)**
  - b. No **(if no, skip to question #21)**
  
19. How long did you breastfeed your last child (# of months)? \_\_\_\_\_

20. Was the experience:
- a. Extremely successful
  - b. Very successful
  - c. Moderately successful
  - d. Slightly successful
  - e. Not at all successful
21. How many children have you given birth to? \_\_\_\_\_
22. What is your age? \_\_\_\_\_
23. What is your ethnic origin?
- a. Black
  - b. Asian
  - c. White
  - d. Hispanic
  - e. Native American
  - f. Other (please specify): \_\_\_\_\_
24. Circle the highest grade completed:
- |                  |    |    |    |     |   |   |   |   |
|------------------|----|----|----|-----|---|---|---|---|
| Grade school:    | 1  | 2  | 3  | 4   | 5 | 6 | 7 | 8 |
| High school:     | 9  | 10 | 11 | 12  |   |   |   |   |
| College:         | 13 | 14 | 15 | 16  |   |   |   |   |
| Graduate School: | 17 | 18 | 19 | 20+ |   |   |   |   |
25. Are you enrolled in WIC?
- a. Yes
  - b. No
26. What is your relationship status? \_\_\_\_\_
27. Who is YOUR primary prenatal care provider?
- a. Nurse midwife
  - b. Obstetrician
  - c. Family practice physician
  - d. Other (please specify) \_\_\_\_\_

This is the end of the questionnaire. If you have further comments, please write them on the back of this page. **Thank you for your time.**

APPENDIX D

8 WEEK POSTPARTUM FOLLOW-UP INTERVIEW QUESTIONS

1. On a scale of 1 to 7, with 1 being your baby is 100% breastfed and 7 being your baby is currently 100% formula fed, how would you rate your current feeding practices over the last week?
2. If you are still breastfeeding at all, what is your current breastfeeding goal in months?
3. Have you met your breastfeeding goal or are you on track to meet it? (yes/no)
4. If you gave yourself a rate of 7, did you try to breastfeed? (yes/no)
5. If you gave yourself a rate of 7, how many weeks old was your baby when you last breastfed?
6. What is the gender of your baby?
7. Did you receive the free prenatal breastfeeding consult with one of the St. Peter's LCs? (yes/no)
8. Can you tell me some of the reasons why you did or did not attend a prenatal LC consult?
9. Do you know if your insurance covers prenatal lactation services? If so, is this a benefit you would have liked to have used?
10. Is there anything you can think of that would have helped you meet your breastfeeding goals?

APPENDIX E

COMPARISON OF BAPT STATEMENTS OF WOMEN EXCLUSIVELY  
BREASTFEEDING AND PARTIAL/NO BREASTFEEDING  
AT 8 WEEKS (COMPLETELY ADHERENT PARTICIPANTS)

Comparison of BAPT Statements of Women Exclusively Breastfeeding (n=13) and  
Partial/No Breastfeeding (n=6) at 8 Weeks (Completely Adherent Participants)

<i>BAPT Statements</i>	<u>Exclusively BF</u>		<u>Partial/No BF</u>	
	<i>Mean</i>	<i>SD</i>	<i>Mean</i>	<i>SD</i>
<i>(scale 1-6, 1=strongly disagree, 6= strongly agree)</i>				
I have the necessary skills to breastfeed	5.46	0.78	4.83	0.75
I am physically able to breastfeed	5.77	0.60	4.67	1.37
I know how to breastfeed	4.92	0.95	4.50	1.64
I am emotionally ready to breastfeed	5.54	0.52	5.50	1.22
I am determined to breastfeed	5.54	0.78	6.00	0.00
I won't need help to breastfeed	3.85	1.34	3.17	0.98
I have total control over my breastfeeding	4.54	1.27	3.50	1.52
Breastfeeding is easy	3.23	1.48	2.67	1.75
I am confident I can breastfeed	5.38	0.87	4.83	1.47
I know I will have enough milk for the baby	4.85	0.99	4.17	1.94

\*Statements reprinted with permission from Janke

APPENDIX F

DESCRIPTION OF OVERALL SAMPLE

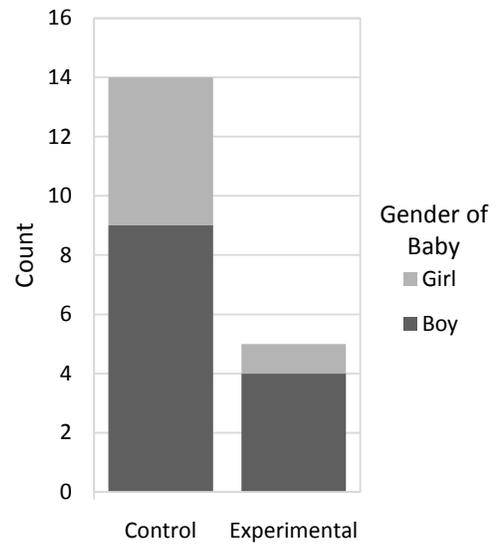
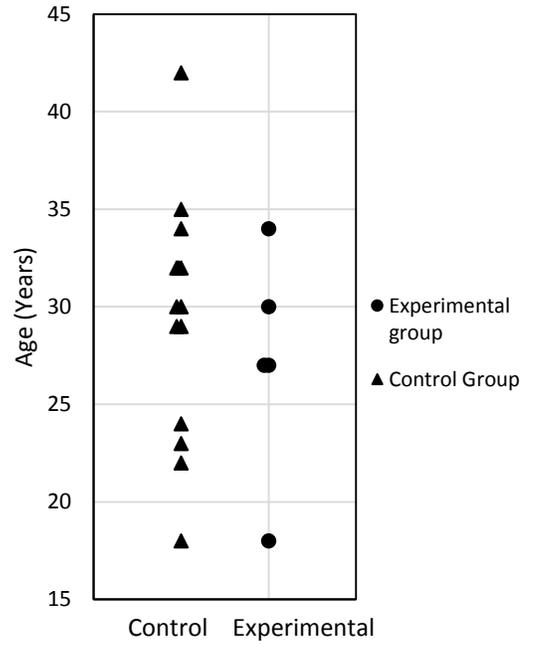
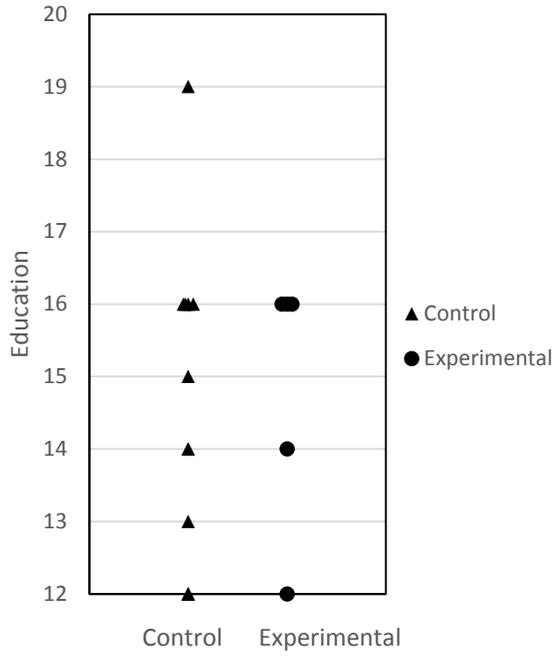
Table 2

*Description of Overall Sample*

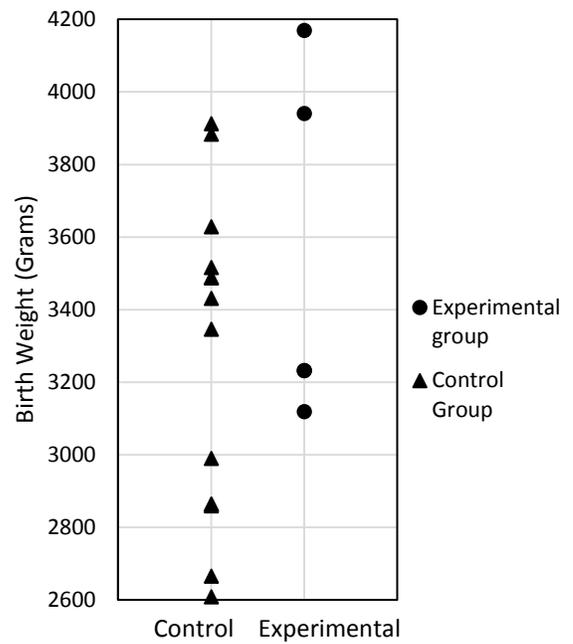
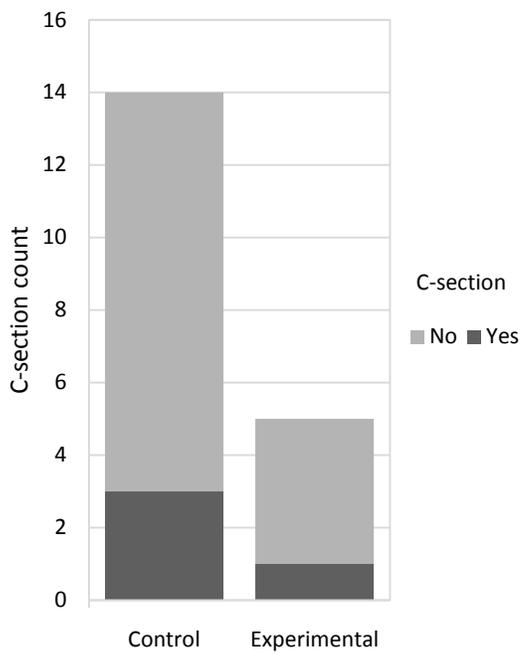
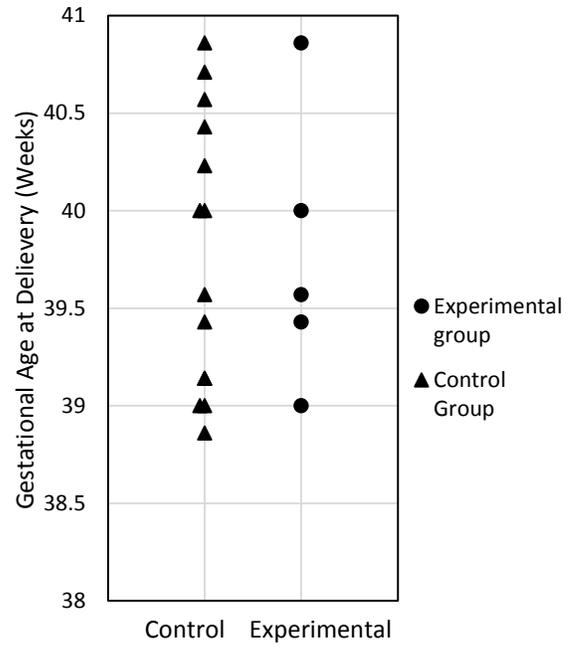
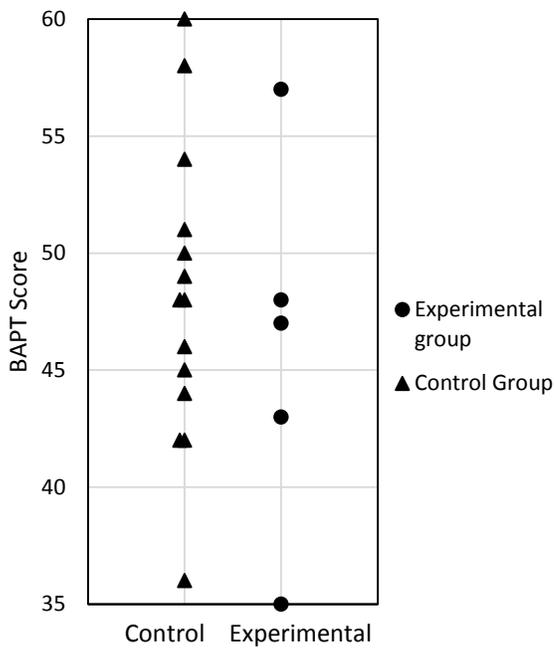
Variable/Description	Control group <i>n</i> = 14 (73.7%)	Experimental group <i>n</i> = 5 (26.3%)
Age (years)		
< 20	1 (7.1%)	1 (20%)
20-35	12 (85.7%)	4 (80%)
> 35	1 (7.1%)	0
Level of Education		
High school graduate	3(21.4%)	1 (20%)
Some college	4 (28.6%)	1 (20%)
College graduate	4 (28.6%)	3 (60%)
Race		
Caucasian	13 (92.9%)	4 (80%)
Asian	0	1 (20%)
Native American	1 (7.1%)	0
Relationship Status		
Married	12 (85.7%)	3 (60%)
Single	1 (7.1%)	2 (40%)
In a relationship	1 (7.1%)	
Enrolled in WIC		
Yes	3 (21.4%)	1 (20%)
No	11 (78.6%)	4 (80%)
Mode of Birth		
Vaginal	11 (78.6%)	4 (80%)
C-section	3 (21.4%)	1 (20%)
Gender of Baby		
Male	9 (64.3%)	4 (80%)
Female	5 (35.7%)	1 (20%)
BAPT score (average)	48.07	46
Hospital IBS score		
1	14 (100%)	5 (100%)
2-7	0	0
Previous Breastfeeding Experience		
Yes	12 (85.7%)	1 (20%)
No	2 (14.3%)	4 (80%)
Initial Breastfeeding Goal		
Unsure	0	1 (20%)
<3 months	1 (7.1%)	0
3 to <15 months	12 (85.7%)	4 (80%)
>24 months	1 (7.1%)	0\

APPENDIX G

EXPERIMENTAL AND CONTROL GROUP CHARACTERISTICS

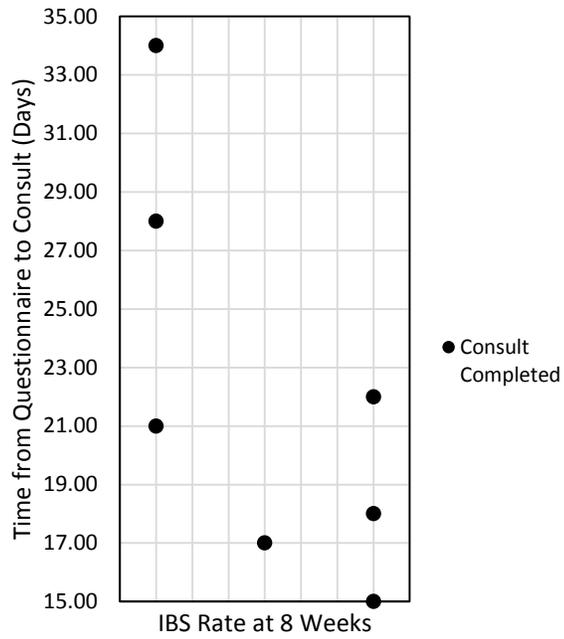
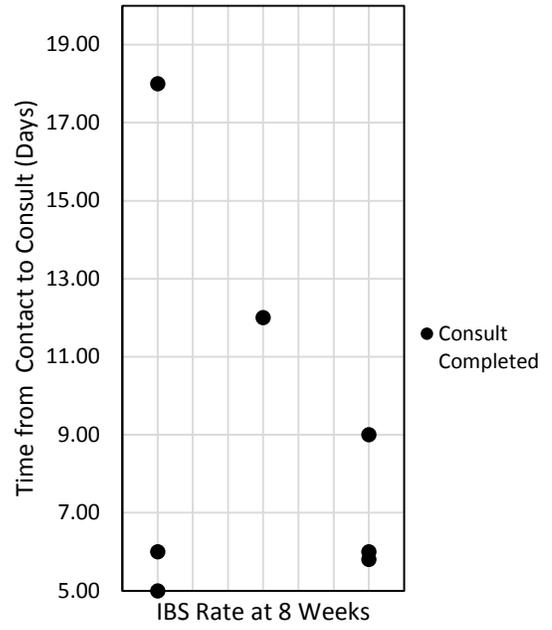
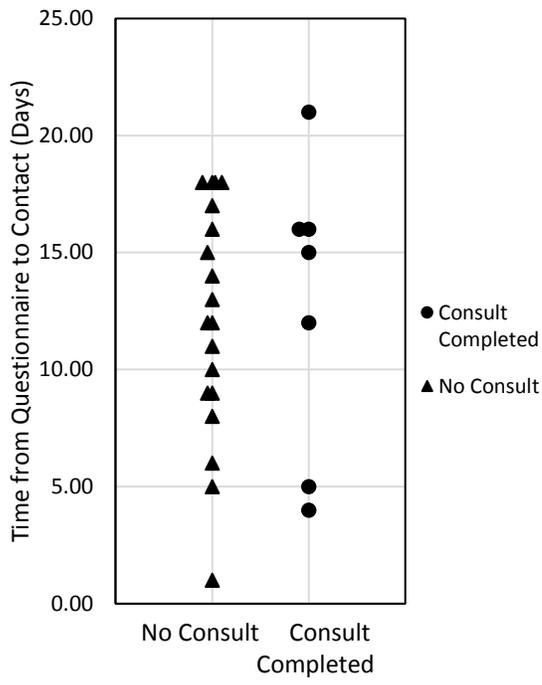


Appendix G (Continued)



APPENDIX H

TIMING: IMPACT ON LIKELIHOOD OF COMPLETING  
A CONSULT AND IBS RATE AT EIGHT WEEKS



APPENDIX I

MAIN REASONS WOMEN CHOOSE TO BREASTFEED

Table 3

*Main Reasons Women Choose to Breastfeed*

(n = 56)	Percent of Participants
Healthy for baby	55% (31)
Cheap	48% (27)
Bonding	25% (14)
Healthy	25% (14)
Natural	18% (10)
Convenient	16% (9)
Good/best for baby	16% (9)
Other	13% (6)
Previous experience	1% (5)