

PRENATAL BREASTFEEDING EDUCATION TOOLKIT
FOR BABY-FRIENDLY HOSPITALS

by

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DEDICATION

To my mother, Debra Hulbert, who has spent her entire nursing career ceaselessly advocating for mothers and infants. Thank you for all your support and encouragement over the years. Without you, I would never have made it this far.

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ABSTRACT

Studies suggest that approximately half of women do not meet their breastfeeding goal. The objectives of this study were to implement a prenatal breastfeeding education toolkit, assess prenatal breastfeeding goals, gauge breastfeeding goal attainment at 10 weeks postpartum, and evaluate patient variables that may impact goal attainment.

The educational information was compiled into a toolkit and divided into three sections, one for each trimester. After completing at least one trimester of education, patients were then asked to fill out a survey on their breastfeeding goals. They were contacted by phone at approximately 10 weeks postpartum to assess how their breastfeeding was progressing and if they were still on track to meeting their goals.

A total of 20 participants were included in data analysis. The reported goal duration of the whole cohort ranged from 16 weeks to two years with an average of approximately 50 weeks. The majority (75%) reported that they planned to breastfeed exclusively. At 10 weeks postpartum, 65% of subjects were on track to or had met their goal breastfeeding duration. Subsequently, 35% reported early cessation of breastfeeding prior to reaching their goal. Of the 15 participants who planned to breastfeed exclusively, only about half (53%) were still exclusively breastfeeding at the time of follow-up. Patients who planned to supplement with formula from an early stage were more than twice as likely (60%) to have early cessation of breastfeeding compared to those who planned to breastfeed exclusively (27%).

The results of this study suggest that most women would like to breastfeed exclusively and for longer periods of time. Unfortunately, many continue to fall short of their goals. Planning to breastfeed exclusively appears to increase the mother's chance of reaching her goals at ten weeks postpartum. The literature has shown that prenatal education has a positive impact on breastfeeding rates. Unfortunately, due to time constraints, this study was unable to evaluate the impact of the entire prenatal breastfeeding education toolkit on breastfeeding goal attainment.

INTRODUCTION

Background

The importance of breastfeeding is fairly well understood by health care providers. Breastfeeding has been shown to significantly decrease infants' risk for respiratory tract infections, otitis media, urinary tract infections, and sepsis. The long-term benefits also include decreased risk for acute otitis media, atopic dermatitis, nonspecific gastrointestinal infections, lower respiratory tract infections, childhood leukemia, sudden infant death syndrome, and improved cognitive development (Anderson, Johnstone, & Remley, 1999; Ip et al., 2007; Kramer et al., 2008). Furthermore, breastfeeding has been shown to significantly decrease the risk for premenopausal breast cancer and ovarian cancer for the mother as well, not to mention the numerous psychological and attachment benefits supported in the literature (Gwinn, Lee, Rhodes, Layde, & Rubin, 1990; Johnson, 2013; Lobbok, 2001; Newcomb et al., 1994).

The benefits of breastfeeding extend beyond the mother-child couplet to benefit the community as well. The American Academy of Pediatrics published a cost analysis that looked at the financial impact of exclusive breastfeeding on ten conditions including gastroenteritis, necrotizing enterocolitis, otitis media, lower respiratory tract infections, asthma, atopic dermatitis, diabetes mellitus type II, obesity, childhood leukemia, and sudden infant death syndrome. They found the United States alone would save 911 infant lives and 13 billion dollars per year if 90% of women met the recommendations for

breastfeeding up to six months (Bartick & Reinhold, 2010). Similarly, another cost analysis was conducted to look at the societal financial impact of suboptimal breastfeeding on the following maternal diseases: breast cancer, ovarian cancer, myocardial infarction, hypertension, and type II diabetes. They found that the current low breastfeeding rates lead to over 17 billion dollars in healthcare expenditures for the mother when compared to if 90% of women breastfed up to one year (Bartick et al., 2013).

In addition to displacing the potential benefits of breast milk, formula presents several other significant risks. Firstly, in-hospital supplemental feeding is the most significant predictor of breastfeeding cessation (Howard et al., 2003). Studies have shown that any non-medically indicated supplementation in the first two days of life is associated with an increased risk of early breastfeeding cessation and decreased success. Those infants who received any formula supplementation in the hospital were almost two times more likely to begin supplementing between their first and second month and nearly three times more likely to stop breastfeeding altogether by two months (Chantry, Dewey, Pearson, Wagner, & Nommsen-Rivers, 2014). This is consistent with the findings of a longitudinal cohort study of 350 newborns, which found infants who received formula supplementation in the first month of life, regardless of quantity, were almost three times more likely to have early cessation of breastfeeding (Vogel, Hutchison, & Mitchell, 1999).

Secondly, formula causes alterations in the physiology of the infant gut. Maternal colostrum and breast milk contain important immunologic components including IgA

antibodies, leukocytes, cytokines, growth factors, nucleotides, prebiotics, and enzymes that are not found in formula (Gregory, Dubois, & Steele, 2014; Jackson & Nazar, 2006). The prebiotics found in breast milk promote the growth of normal gut flora thereby supporting optimal gut maturation and nutrient absorption in the breastfed infant (Gregory et al., 2014). Formula alters this normal physiology within the infant gut leading to altered barrier function, endocrine cells, microbiota, nutrient absorption, and hydrolytic capacity. Formula causes intestinal hypertrophy, increased permeability, and bacterial translocation, therefore leading to increased risk of hypersensitivity and infection (Le Huerou-Luron, Blat, & Boudry, 2010).

According to the American Academy of Pediatrics (AAP), the current recommendation is human milk should be the exclusive source of nutrients for term infants for the first six months of life with complementary solid foods after six months of age (AAP, 2015). In 1998, the World Health Organization conducted a large, systematic review and identified healthcare practices that were negatively impacting breastfeeding. From these practices they outlined the Ten Steps to Successful Breastfeeding that should be implemented in the hospital to promote breastfeeding. Endorsed by the American Academy of Pediatrics, these include having a breastfeeding policy, training and educating staff on how to implement the policy, informing all pregnant women about the benefits and management of breastfeeding, show mothers how to breastfeed and maintain breastfeeding when separated from their infant, allow no non-medically indicated supplementation, practice rooming-in, encourage on-demand feedings, discourage the use

of pacifiers, and foster breastfeeding support groups (Eidelman, 2012). (See Appendix B.)

The World Health Organization (WHO) and the United Nations Children's Fund (UNICEF) came together to develop the Baby-Friendly Hospital Initiative (BFHI). Based on the Ten Steps, this globally recognized program supports and endorses hospitals that provide evidence-based breastfeeding care (WHO, 1991). Women who deliver at Baby-Friendly certified hospitals have higher breastfeeding self-efficacy, increased initiation and duration of breastfeeding, and higher rates of exclusivity (DiGirolamo, Grummer-Strawn, & Fein, 2008; Otsuka et al., 2014). There is a positive dose-response to the Ten Steps, so each additional step that mothers experience increases their chances of successfully breastfeeding (DiGirolamo et al., 2008).

As healthcare continues to evolve, the need to improve patient care and reduce cost has taken center stage. Research supporting the numerous benefits of breastfeeding has driven these evidence-based measures. The United States Breastfeeding Committee (USBC) Healthy People 2020 outlines goals for breastfeeding rates at three months, six months, and one year of life (USBC, 2015). The Joint Commission (TJC) has also identified breastfeeding quality measures such as in-hospital exclusive breastfeeding rates, which may soon be linked to reimbursement (TJC, 2016). (See Appendix A.)

Statement of the Problem

Despite the ever-growing mountain of knowledge about breastfeeding, rates continue to fall below national goals. In the United States, only 40.7% of infants are

exclusively breastfed at three months. That number drops to 18.8% at six months of age (CDC, 2014a).

Studies suggest that approximately 50% of women do not meet their breastfeeding goal (Adams, Berger, Conning, Cruikshank, & Dore, 2001; Odom, Li, Scanlon, Perrine, & Grummer-Strawn, 2013). Prenatal breastfeeding education can significantly improve breastfeeding initiation, duration, and exclusivity (Dyson, McCormick, & Renfrew, 2005; Mattar et al., 2007). Unfortunately, there are currently no consistent recommendations or tools for providing prenatal breastfeeding education consistent with the BFHI.

Purpose

The purpose of this study is to help mother's reach their breastfeeding goals and improve exclusive breastfeeding duration through consistent, evidence-based, prenatal breastfeeding education.

Project Objectives

1. Evaluate the current breastfeeding duration and exclusivity goals at a local obstetrics and gynecology office.
2. Evaluate current breastfeeding duration and exclusivity goal-attainment rates at 10 weeks postpartum.
3. Describe variations in patient demographics and variables and their associated goal-attainment rates.

Conceptual Framework

Doratheia Orem's Self-Care Deficit Theory will provide the conceptual framework to guide this health-promotion project (Orem, 2003). The Self-Care Deficit Theory describes the importance of self-care and the essential role nursing plays when a patient experiences a deficit in their self-care. In general, self-care is the continuous actions or behaviors done by a person that improves or promotes functioning or health (Orem, 2003, pp. 212-214). According to Orem, when a self-care deficit exists, nursing care is required to help the patient meet that deficit, thereby promoting the patient's health (Orem, 2003).

Successful breastfeeding is the targeted self-care behavior that offers significant, positive health outcomes for both the mother and infant. A self-care deficit occurs when the mother and infant are unable to successfully breastfeed. According to Orem (2003), both adequate skills and knowledge are required for self-care. It is the nurse's role to help patients meet the self-care demand of breastfeeding by providing evidence-based, breastfeeding education and support.

Significance of the Project

This project provides Baby-Friendly hospitals with an evidence-based, prenatal education toolkit aimed to meet the WHO and UNICEF breastfeeding guidelines. This project will also evaluate patients' breastfeeding goals and infant feeding plans in the prenatal period. Additionally, through follow-up phone calls, this project will provide evidence to evaluate goal-attainment rates and associated variables.

Operational Definition of Terms (Lumbiganon et al., 2012; WHO, 1991)

1. *Exclusively breastfed* is defined as an infant who is receiving only human milk and necessary medicines or vitamins such as iron or vitamin D.
2. *Breastfed with supplementation* is defined as infants receiving breast milk in addition to breastmilk substitutes or infant formula.
3. *Formula fed* is defined as an infant who receives only formula or breastmilk substitutes as their sole form of nutrition.
4. *Early cessation* is defined as the discontinuation of breastfeeding prior to the mother's stated breastfeeding goal.

Assumptions and Limitations

As a doctoral scholarly project, the time parameters acted as a significant limitation for both implementing the toolkit and measuring outcomes. As this toolkit spans all three trimesters, it would be ideal to measure outcomes a full year after implementation so as to obtain a cohort that was exposed to all three trimesters of education and extend at least three months into the postpartum period. Unfortunately, due to time constraints, this was not possible for this study.

Organization of the Remainder of the Paper

The remainder of the paper is organized into four sections, including the review of literature, methods of the study, and results, concluding with project outcomes and recommendations.

REVIEW OF THE LITERATURE

Search Methods, Topics, and Results

Literature was collected and reviewed from online databases including CINAHL, Pubmed, Cochrane, Medline, Google Scholar, Up to Date, and the National Guidelines Clearinghouse. Search terms included breastfeeding, breastfed, baby-friendly hospital, prenatal, antenatal, support, education, goals, intended duration, and toolkit. Studies were limited to only those published in peer-reviewed, scholarly journals and less than 25 years old. Studies focusing solely on high-risk populations (NICU, preterm, low birth weight, etc.), breastfeeding education for nurses or other health care professionals, and case studies were excluded.

Results varied based on the type of intervention studied including formal education, informal education, written and online material, one-on-one, group classes, and peer-support groups. The measured outcomes varied as well, including the breastfeeding initiation rates, duration of breastfeeding, and rates of exclusive breastfeeding at different time intervals. The literature reviewed included primarily systematic reviews, meta analyses, and quantitative, quasi-experimental studies; however, descriptive observational, cross sectional, and longitudinal studies were also included.

It was noted that many studies did not provide descriptions of the quality or content of educational materials. The outcomes measured also differed based on varying definitions of terms such as exclusivity or “primarily breastfeeding.” The control groups

were frequently based on “normal” or “routine” prenatal care, which was typically not described or defined.

Types of Prenatal Breastfeeding Support

Within these studies, several different forms of prenatal breastfeeding support and education were evaluated and compared for efficacy. These support and educational interventions included formal educational programs, written educational materials, lactation consults, peer counseling, one-on-one education, weekly classes, video demonstrations, hands-off teaching, positive encouragement, and routine prenatal care.

Firstly, when looking at prenatal breastfeeding education in general, one systematic review found that all forms of health education were effective in increasing initiation rates when compared to routine prenatal education (Dyson et al., 2005). Furthermore, educational programs were the single-most effective prenatal intervention to improve initiation and short-term duration of breastfeeding as well (Guise et al., 2003).

When looking at breastfeeding education and support together, one randomized control trial of 401 women found that expectant mothers who receive breastfeeding educational materials and lactation counseling prenatally were more likely to exclusively breastfeed at three and six months compared to those that received only routine prenatal care (Mattar et al., 2007). However, written educational materials alone appear to be ineffective at increasing breastfeeding rates (Guise et al., 2003).

Alternatively, a systematic review and meta-analysis was conducted in an attempt to compare these different methods of breastfeeding education and support against one

another to determine which was most effective. Lumbiganon et al. (2012), concluded that any form of prenatal education or support, including peer counseling, formal breastfeeding education, and consults with lactation consultants, was found to increase breastfeeding duration. However, due to methodological limitation, there was insufficient evidence to support any one prenatal education strategy over any other in improving breastfeeding initiation or duration (Lumbiganon et al., 2012).

There have been several studies comparing alternative methods for educating. A retrospective cohort of 194 mothers looked at the impact of different types of breastfeeding education to improve breastfeeding rates at six months postpartum. The researchers found significantly improved breastfeeding rates at six months in the groups that received either one-on-one education, video demonstration, or attended weekly classes compared with moms who received normal prenatal care; however, there was no significant difference between the intervention groups (Rosen, Krueger, Carney, & Graham, 2008).

Likewise, Wolfberg et al. (2004) found that mothers who were provided peer counseling versus routine prenatal education also had significantly increased rates of initiation of breastfeeding. Breastfeeding education and support interventions were also more effective if they utilized more than one method such as hands-off teaching with positive encouragement; however, utilizing multiple education-only methods alone does not increase breastfeeding outcomes (Hannula, Kaunonen, & Tarkka, 2008; Lumbiganon et al., 2012).

Types of Postpartum Support

Postpartum support can be divided into two main categories: postpartum breastfeeding education and support interventions. Firstly, the literature shows that postpartum breastfeeding education did not have a significant impact on breastfeeding duration. Khresheh, Suhaimat, Jalamdeh, and Barclay (2011) conducted a randomized control trial of 90 primiparous women. Half were put in the control group and received normal postnatal care. The intervention group was given one-on-one, postnatal breastfeeding education. Breastfeeding knowledge and duration was assessed at six months postpartum. The researchers found that, although there was a significant increase in the breastfeeding knowledge score in the intervention group, the postnatal education intervention did not significantly impact breastfeeding duration (Khresheh et al., 2011).

Alternatively, several studies have looked at the efficacy of varying support interventions. A systematic review that focused on different types of postpartum support interventions found that support interventions, such as peer counseling or professional support from a lactation consultant, had the greatest effect on increasing breastfeeding exclusivity rates (Britton, McCormick, Renfrew, Wade, & King, 2007). Renfrew, McCormick, Wade, Quinn, and Dowswell (2012) conducted a meta-analysis focusing on the efficacy of postnatal breastfeeding support and also found that any support, from either lay people, professionals, or both, was effective for increasing breastfeeding duration and exclusivity. Notably, breastfeeding rates are improved more by both pre- and postnatal support than by one or the other alone (Chung, Raman, Trikalinos, Lau, & Ip, 2008; Hannula et al., 2008).

Breastfeeding Goals

The majority of women know that breastfeeding is the best form of nutrition for infants. Unfortunately, approximately 50% of mothers still do not reach their intended goal duration (Adams et al., 2001; Chezem, Friesen, & Boettcher, 2003; Odom et al., 2013). Furthermore, approximately two-thirds of women fail to reach their exclusive breastfeeding goals (Perrine, Scanlon, Li, Odom, & Grummer-Strawn, 2012). Women who are unmarried, with lower education levels, enrolled in WIC, or multiparous are at higher risk of not meeting their breastfeeding goals (Odom et al., 2013).

Gagnon, Leduc, Waghorn, Yang, and Platt (2005) published a secondary analysis study that looked at different protective variables for breastfeeding duration. They found intent to breastfeed greater than three months and early childbirth education had a significant protective effect on successful breastfeeding duration. In contrast to this, Odom et al. (2013) found no significant difference in breastfeeding goal attainment based on the prenatally reported goal duration. In other words, women were not more or less likely to reach their goal based on their intended breastfeeding duration.

Alternatively, Chezem et al. (2003) found that the method of infant feeding had a significant impact on whether a mother met her breastfeeding goal. According to the data, mothers who choose both breastfeeding and formula feeding are less likely to reach their intended breastfeeding duration compared to women who choose to exclusively breastfeed.

Another very important consideration when evaluating breastfeeding goals is the reported reasons for early cessation. One study by Adams et al. (2001) found the most

commonly reported reasons for quitting were dissatisfaction with their breastfeeding experience and perceived inadequate supply. The authors also discovered that primiparous women are less likely to reach their goal compared to multiparous women, which is in contrast to the findings of Odom et al. (2013). The most commonly cited breastfeeding problem in this group was sore or cracked nipples (Adams et al., 2001).

Of women who do not meet their breastfeeding goals, the most commonly cited reasons included lactation and infant weight concerns, issues with pumping, and the need to take medications (Odom et al., 2013).

Baby-Friendly Hospital Initiative

The Baby-Friendly Hospital Initiative (BFHI), developed by the WHO and UNICEF, recognizes hospitals that successfully implement the Ten Steps to Successful Breastfeeding. The Ten Steps include having a written breastfeeding policy, training healthcare professionals to understand and follow the policy, educating mothers on the importance of and how to maintain breastfeeding, infant rooming-in, initiating breastfeeding within the first hour after birth, encouraging breastfeeding on-demand, limiting the use of pacifiers, discouraging non-medically indicated formula supplementation, and fostering breastfeeding support groups (WHO, 1998). Each of these steps is an evidence-based practice that healthcare professionals can implement to promote breastfeeding. The literature shows that women who deliver at Baby-Friendly certified hospitals have increased rates of breastfeeding initiation, duration, degree of

exclusivity, and level of self-efficacy (DiGirolamo et al., 2008; Kramer et al., 2001; Otsuka et al., 2014).

In 2001, the Promotion of Breastfeeding Intervention Trial (PROBIT), a randomized controlled trial, looked at over 31 healthcare facilities and 17,000 mother-infant pairs. They found that infants born at hospitals modeled after the BFHI were more likely to be exclusively breastfed at three months and six months, and breastfed to any degree at 12 months of age. These infants also had significantly fewer cases of atopic dermatitis and gastrointestinal tract infections (Kramer et al., 2001).

Similarly, based on the Infant Feeding Practices Study II, DiGirolamo et al. (2008) published an analysis that looked at the efficacy of six out of the Ten Steps, evaluating only the steps mothers could easily self-report (BF within the first hour, no supplements, rooming-in, utilizing BF support group, supporting BF on-demand, and limiting the use of pacifiers). The researchers concluded that mothers who reported experiencing none of the steps were almost 13 times more likely to have early cessation of breastfeeding. In fact, each additional step that mothers experienced had a positive dose-response on breastfeeding success. Essentially, every extra step that mothers experienced increased their chances of successfully breastfeeding.

Incidence

The current recommendation is human milk should be the exclusive source of nutrients for term infants for the first six months of life with complementary solid foods after six months of age (AAP, 2015). In the United States, only 40.7% of infants are

exclusively breastfed at three months. That number drops to 18.8% at six months of age (CDC, 2014a). Even with all the education, support, and resources available, more than half of women are still failing to reach their breastfeeding goals (Adams et al., 2001; Chezem et al., 2003).

Summary

Overall, the literature available on the benefits of breastfeeding and risks of formula is vast. The current recommendation is human milk should be the exclusive source of nutrients for term infants for the first six months of life. Nonetheless, over half of breastfeeding mothers still fail to meet their breastfeeding goals. The Ten Steps and the Baby-Friendly Hospital Initiative outline well-supported, evidence-based practices that improve breastfeeding initiation, duration, and exclusivity. Among these recommendations is the need to provide prenatal breastfeeding education and support to all pregnant women. Unfortunately, there are currently no consistent recommendations, methods, or tools for providing prenatal breastfeeding education consistent with the BFHI.

Many different forms of prenatal breastfeeding support and education were evaluated and compared for efficacy including formal educational programs, written educational materials, lactation consults, peer counseling, one-on-one education, weekly classes, video demonstrations, hands-off teaching, positive encouragement, and, finally, routine prenatal care. The literature shows that educational programs are the most effective prenatal education method for improving breastfeeding initiation and short-term

duration. There is no strong evidence to support one specific intervention over the other; however, it is clear written materials alone are ineffective. Utilizing multiple methods appears to be more effective than a single method and support interventions, such as peer counseling, must be provided in the postnatal period. In order to improve breastfeeding rates and help mothers reach their goals, education and support must begin early in the prenatal care and extend beyond delivery well into the postnatal period.

Stated Problem

Despite the immense amount of knowledge about the benefits of breastfeeding, U.S. breastfeeding rates continue to fall well below national objectives. Studies have shown the majority of women do not meet their breastfeeding goals and prenatal breastfeeding education can significantly improve breastfeeding initiation, duration, and exclusivity. Unfortunately, there are currently no consistent recommendations or tools for providing prenatal breastfeeding education consistent with the Baby-Friendly Hospital Initiative. Furthermore, there is no current evidence looking at the impact of prenatal breastfeeding education on breastfeeding goal attainment.

Intended Improvement

The intended objective of this quality improvement project is to create an evidence-based, prenatal breastfeeding education toolkit that is consistent with the Ten Steps and can be utilized by Baby-Friendly Hospitals and associated clinics.

Project Question

The question to be addressed by this project is: What breastfeeding goals are mothers setting for themselves in the prenatal period and how are mothers doing with reaching those goals at 10 weeks postpartum?

METHODS

Design

This study is a quality improvement project based on the implementation and evaluation of an evidence-based, prenatal education toolkit for Baby-Friendly Initiative Hospitals.

Setting and Sample Population

This study was conducted at a local obstetrics office in Eastern Montana in conjunction with a local hospital. Patients and mothers in the late prenatal period were recruited if they completed at least one trimester of education and were to be approximately 10 weeks postpartum during follow-up data collection. The sample included approximately 20–30 women in the postpartum period. Subjects were excluded if they were no longer in custody of their infant, experienced complications such as miscarriage or stillbirth, or if they indicated the desire to solely formula feed. No compensation was offered.

Institutional Review Board and Subject Protection

IRB approval was granted from Montana State University Institutional Review Board and the Institutional Review Board of Billings. The prenatal education curriculum was implemented for all patients at the clinic. The informed-consent form was obtained from all participants prior to their being asked to complete the breastfeeding education

survey and receiving a follow-up phone call at 10 weeks postpartum. Patient identifying information collected included first name and phone number. This information was kept secure and confidential at all times. While at the clinic, surveys were kept in a locked file cabinet at all times. While in the researcher's possession, surveys were stored in a locked file cabinet. Data was stored on a password-protected computer and only unidentifiable data were included in the final report. Once all data had been collected and evaluated, surveys were destroyed.

Measures and Instruments

The educational toolkit was developed based on requirements outlined by the Baby-Friendly Hospital Initiative and current evidence available in the literature. Information was collected and compiled primarily from the American Academy of Pediatrics, as well as a few other credible, peer-reviewed sources, then divided into three sections to be implemented throughout the pregnancy. First-trimester education includes information on the benefits of breastfeeding, the importance of exclusive breastfeeding, and the basic physiology involved in lactogenesis. Second-trimester education focuses on requirements outlined by the Baby-Friendly Hospital Initiative, including the importance of rooming-in, baby-led feeding, frequency of feeding, skin-to-skin care, and non-pharmacologic pain relief methods along with information on breastfeeding support group options. Finally, the third-trimester education focuses on position and latch techniques, troubleshooting common issues, how to get help in the hospital, and how to obtain a breast pump. The education ends with information on breastfeeding in public,

returning to work or school while breastfeeding, and recommendations for continuation of breastfeeding after adding in complementary solid foods.

Consent was provided and a survey was given at the end of the third trimester if the mother had received at least one trimester of education. Data collected included age, ethnicity, level of education, expected date of delivery, primiparity, if they met their breastfeeding goals in the past, and what their current breastfeeding goal was. Space was provided for first name and contact information for follow-up to see if they were on track to meeting their goal.

Procedures

All nurses were required to complete breastfeeding education outlined by the Baby-Friendly Hospital Initiative, thereby establishing internal consistency. The educational information was compiled into a toolkit and divided into three sections; one for each trimester. The toolkit was given to the patient to keep, review, and make notes. Education was conducted by the nurse in the first, second, and third trimesters. If patients received at least one trimester of education prior to delivery, they were offered the opportunity to give consent to be included in the study and fill out a survey (Appendix C). On the survey, patients listed their goal for how long they wished to breastfeed. Those mothers who indicated desire to partially or exclusively breastfeed were then contacted by phone at approximately 10 weeks postpartum to assess how their breastfeeding was progressing. Due to time constraints of this project, it was not possible to fully implement all three sections of education and follow-up at the designated goal outlined by mothers if

it was longer than 10 weeks postpartum. Therefore, any patients who had received at least one trimester's worth of education and reported a desire to breastfeed were recruited.

Data Analysis

Data analysis was conducted in consultation with Montana State University Statistical Consulting and Research Services. The intended sample size of 30 patients was determined based on the analysis of power using the Rule of Three. There were three primary objectives for the data analysis. The first objective was to evaluate patients' history of breastfeeding and initial breastfeeding goals identified in the prenatal period. The second objective was to evaluate and quantify the rates of goal attainment, looking at both duration and exclusivity and any impact prenatal education had on goal attainment. The final object was to evaluate any confounding variations based on age, ethnicity, parity, previous success, or education level that may have affected outcomes.

RESULTS

Research Participants

A total of 26 subjects were initially recruited. One subject was excluded from the sample after reporting her wish to exclusively formula feed. The remaining 25 subjects were contacted at approximately 10 weeks postpartum via the phone. Of these 25 subjects, five did not respond to attempts to contact. The remaining 20 provided follow-up data that was compiled for analysis.

Demographic Information

All subjects for this study were recruited from a local obstetrics office after being provided a prenatal education toolkit. Subjects who received at least one trimester of education and who would deliver in time for follow-up data collection were offered a survey. Unfortunately, due to time constraints, participants were limited to only those in the third trimester. They received follow-up phone calls at approximately 10 weeks postpartum. Data was not collected on patients who declined to be surveyed. Follow-up data was coded based on breastfeeding goal duration and exclusivity.

Subjects ranged from 19 to 38 years old with an average age of 28 years old. Of the 20 participants, 80% identified themselves as Caucasian, 15% identified themselves as Native American, and 5% identified as “Other.” Thirty percent of subjects reported completing high school, 30% reported having some college education, and 40% reported

completing college. Overall, the majority of participants identified themselves as Caucasian and had either completed or received some college education.

Project Goal 1: Description of Breastfeeding Duration and Exclusivity Goals

The first goal of the study was to evaluate patients' history of breastfeeding and initial breastfeeding goals identified in the prenatal period. Goals were then classified by duration and exclusive versus non-exclusive breastfeeding. On the initial survey, 11 participants (55%) reported having at least one baby previously. Of these 11 subjects, all reported having attempted breastfeeding at least once previously. Nine of the 11 participants, or 82%, reported some degree of success with breastfeeding in the past. The reported duration goals of the whole cohort ranged from 16 weeks to two years with an average of approximately 50 weeks. Of the subjects, 75% (15) reported that they planned to breastfeed exclusively; the remaining 25% (5) reported that they planned to both breast- and formula-feed their infant. Ninety-five percent of the subjects (19) reported a duration goal of greater than six months.

Project Goal 2: Description of Duration and Exclusivity Goal Attainment

The second goal of data analysis was to quantify goal attainment. At 10 weeks postpartum, 65% of subjects were on track to meet, or had met, their goal breastfeeding duration. Subsequently, 35% reported early cessation of breastfeeding prior to reaching their goal. Of the 15 participants who planned to breastfeed exclusively, only about half

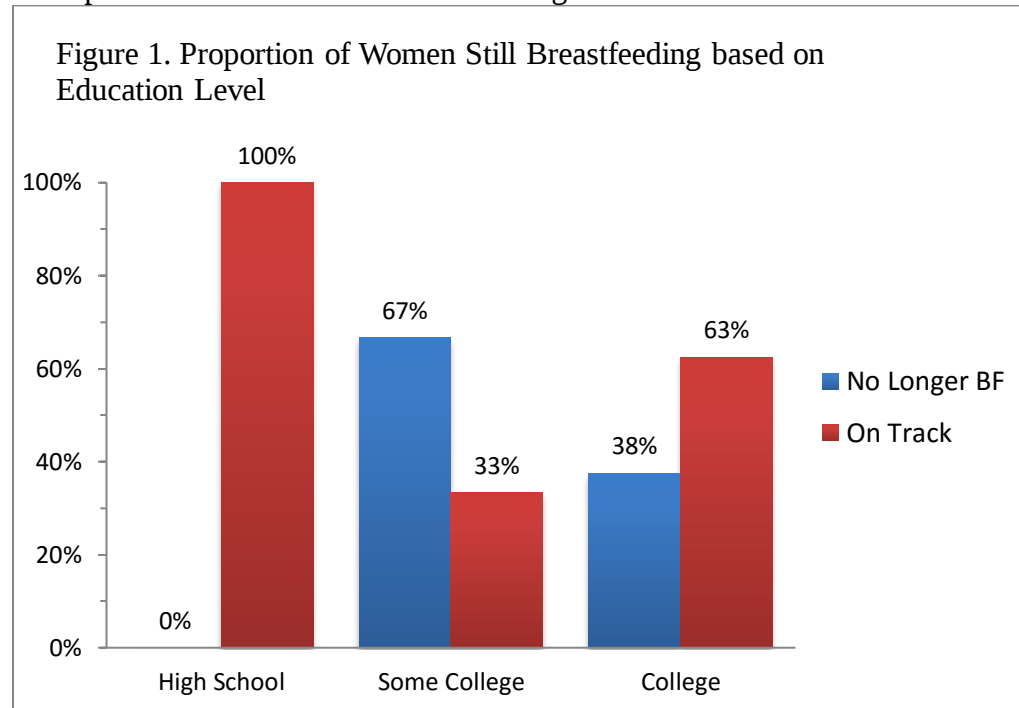
(53%) were still exclusively breastfeeding at the time of follow-up and 20% were both breast and formula feeding. Overall, approximately two-thirds of women were still breastfeeding at ten weeks, but only half of women who wanted to exclusively breastfeed were doing so at that time.

Without a control group, it is difficult to determine to what degree the education toolkit influenced goal attainment. Furthermore, due to time constraints, only women in the third trimester were recruited and, therefore, did not benefit from early and ongoing prenatal breastfeeding education as set up in the toolkit. It is thought that women who receive more education early-on are more likely to have success with their breastfeeding goals. However, due to the design of this study, a conclusion about the impact of the education on goal attainment could not be drawn.

Project Goal 3: Description of Variations in Variables and Associated Goal Attainment

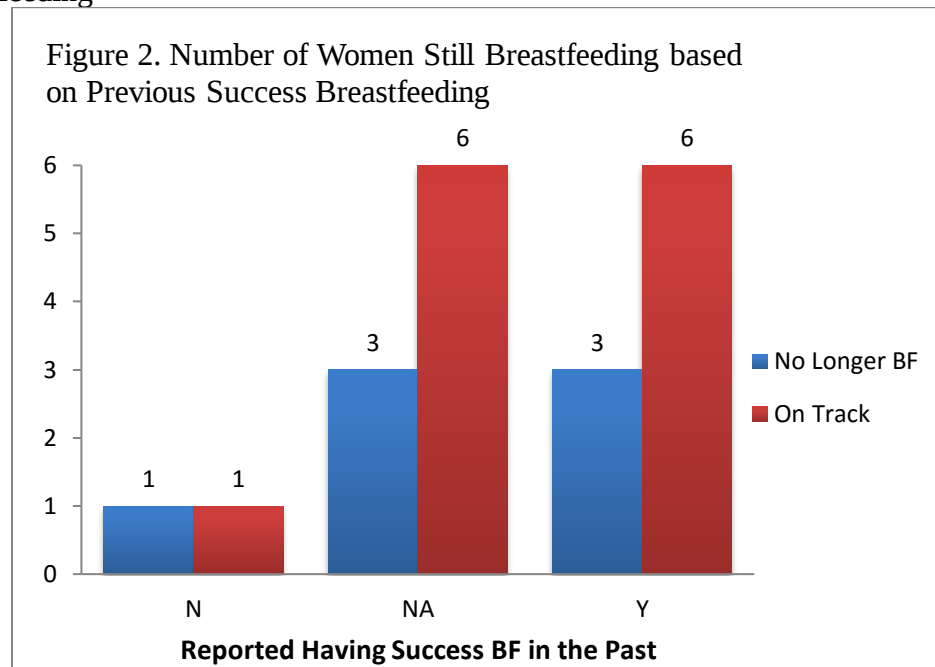
Finally, the third goal of data analysis was to show how goal attainment varies based on age, education, past breastfeeding success, and parity. Patients' education levels were divided into three groups: "high school," "some college," and "finished college." Of the high-school group, all six (100%) were on track to meet or met their breastfeeding duration goal. Only 33% of the "some college" group was on track to meet their goal, while, of the "finished college" group, 63% were still on track to meeting their goal. Thus, both moms who completed high school and those who completed college were most likely to be on track to meeting their breastfeeding goals.

Figure 1. Proportion of Women Still Breastfeeding Based on Education Level



On the survey, patients were asked if they had success meeting their breastfeeding goals in the past. The term “success” was not defined and was self-reported. Of the 11 patients who had breastfed in the past, nine reported success with breastfeeding and two reported “no success” with breastfeeding previously. Of the two participants who stated they did not have success in the past, only one was still on track to meeting her goal. The groups that reported “success in the past” and those who reported “no previous experience breastfeeding” had similar rates of goal attainment. Within these two groups, 67% of participants reported being on track to meet, or had already met, their goal duration.

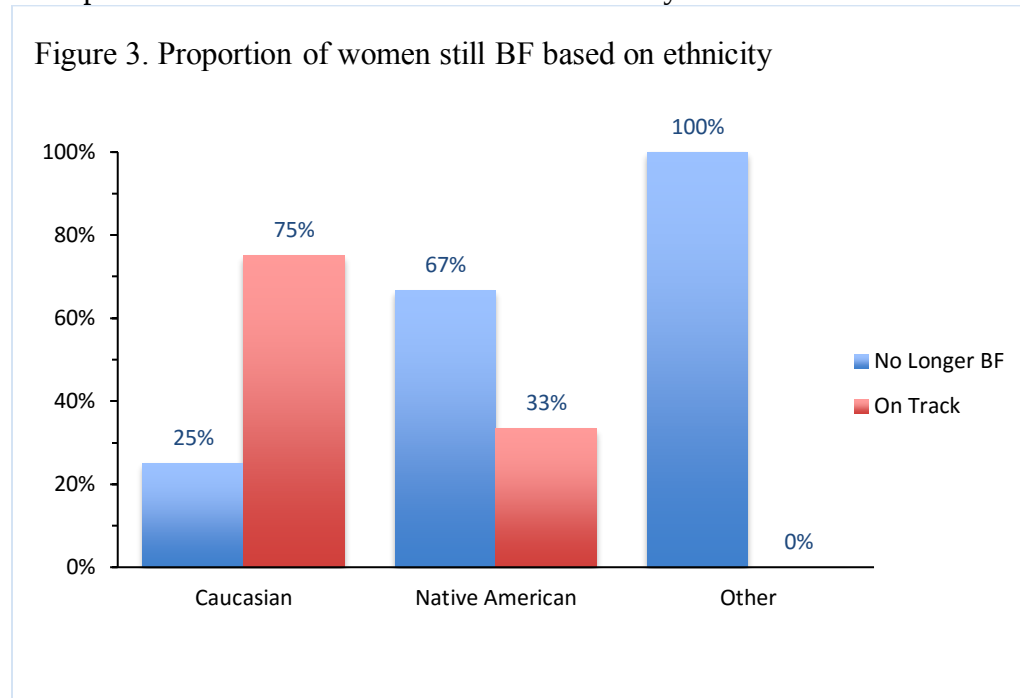
Figure 2. Number of Women Still Breastfeeding Based on Previous Success Breastfeeding



Patients in the age groups 18 to 24, 25 to 29, and over 35 were most likely to still be breastfeeding at the time of follow-up while the participants in the 30–34-year-old group were more likely to have early cessation at approximately 10 weeks postpartum.

Of the 20 participants, 16 identified as Caucasian, three identified as Native American and one identified as “other.” Within these groups, at the time of follow-up, 12 of the 16 patients who reported being Caucasians were still breastfeeding and one of the three Native American patients were still breastfeeding. The singular “other” individual was no longer breastfeeding.

Figure 3. Proportion of Women Still BF Based on Ethnicity



The breastfeeding rates were similar between first-time moms and those with other children. Of first-time moms, 67% were on track to meet or had met their goal duration, while 64% of the multiparous group reported being on track to meet their goals.

Table 1. Percent (#) of Pts That Met BF Goal Based on First Child or Not First Child

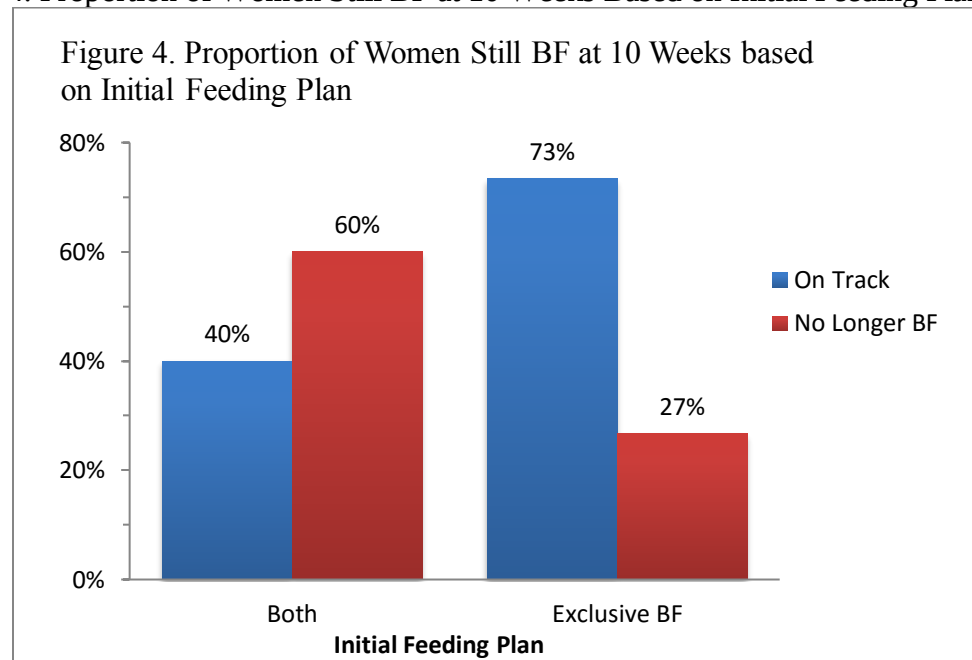
Table 1. Percent (#) of Pts that Met BF Goal based on First Child or Not First Child

Number of Children	Did Not Meet Goal	On Track/Met Goal
First Child	33% (3)	67% (6)
Not First Child	36% (4)	64% (7)

On the survey, subjects were asked *How do you plan to feed your newborn?* and options included: *Breastfeeding Only*, *Formula Feeding Only*, or *Both Formula and*

Breastfeeding. Of women who selected *Both Formula and Breastfeeding*, only 40% were still breastfeeding to any degree at the time of follow-up. This is compared to women who planned to breastfeed exclusively, of whom 73% were still breastfeeding to any degree at the time of follow-up. Therefore, making a plan to breastfeed exclusively in the prenatal period was associated with a higher chance of meeting or being on track to meeting their goal breastfeeding duration when compared to those who planned to both breast and formula feed early on. This is consistent with other studies that found that women who plan to exclusively breastfeed, breastfeed for a longer time duration and are twice as likely to reach their goals (Chezem et al., 2003).

Figure 4. Proportion of Women Still BF at 10 Weeks Based on Initial Feeding Plan



Discussion

Demographically, the sample in this study was comparable to other studies with similar age range, ethnicity, and educational levels (Chezem et al., 2003; Perrine et al., 2012). The population had a mean goal duration of almost one year and the majority of women (75%) reported a desire to breastfeed exclusively. This is similar to the results of the Infant Feeding Practice Study II, which found that 60% of mothers intended to breastfeed exclusively, and the majority of those planned to do so for three months or more (Perrine et al., 2012).

At 10 weeks postpartum, 65% of the total population was still breastfeeding, whether exclusively or with formula supplementation. This is on track with national standards, which show approximately 52% of women are still breastfeeding to some degree at six months (CDC, 2016). Furthermore, 40% were exclusively breastfeeding at the time of follow-up. This is also similar to national statistics, which show approximately 44% of women nationwide are breastfeeding exclusively at 3 months (CDC, 2016).

When looking at education level, women who completed high school and those who completed college were most likely to be on track to meeting their breastfeeding goal duration. Therefore, women who reported “some college” were less likely to reach their breastfeeding goal. Surprisingly, this trend was also found in the Infant Feeding Practices Survey II; however, the underlying significance is unknown (CDC, 2014b).

All multiparous women had reported experience with breastfeeding previously and the majority (9 of 11) reported success with breastfeeding in the past. Within that

group, six of the nine women (67%) who reported success in the past were still breastfeeding at 10 weeks postpartum. Of the group that reported an “unsuccessful” past breastfeeding experience, only one of the two, or 50%, were still on track to meeting their goal at 10 weeks postpartum. Thus, it appears that a negative past experience may negatively impact future breastfeeding success. Unfortunately, the term “success” was not well-defined on the survey and, therefore, cannot be well quantified. It would be helpful for future studies to have patients define “success” and what it means for them.

When looking at the women who planned to breastfeed exclusively compared to those who planned to both breast- and formula-feed, an interesting pattern arose. Of the women who planned to breastfeed exclusively, 73% were still on track to meeting their goal duration at 10 weeks. Alternatively, when looking at the participants who planned to both breast- and formula-feed, only 40% were still on track to meeting their goal duration. In summary, patients who planned to supplement with formula from an early stage were more than twice as likely (60%) to have early cessation of breastfeeding compared to those who planned to breastfeed exclusively (27%). This is consistent with other studies that found that women who plan to both breast- and formula-feed, breastfeed for a shorter duration and are less likely to reach their goals (Chezem et al., 2003). Therefore, it appears that planning to exclusively breastfeed in the prenatal period is associated with increased breastfeeding duration in patients up to 10 weeks postpartum.

PROJECT OUTCOMES AND RECOMMENDATIONS

This quality improvement project was focused on the implementation and evaluation of an evidence-based, breastfeeding-education curriculum in the prenatal setting. Educational information was based on information published by the American Academy of Pediatrics and the Ten Steps to Successful Breastfeeding. Education was compiled by the lead researcher and divided into three parts to be implemented in each trimester.

This study suggests that, although many women would like to breastfeed exclusively and for longer periods of time, many continue to fall short of their goals. Of all participants initially surveyed, nearly all reported that they wanted to breastfeed to some extent and the majority indicated that they planned to breastfeed exclusively. When asked about how long they wished to breastfeed for, most women wanted to breastfeed for at least the recommended one-year duration. In fact, many indicated that they wished to breastfeed their infant for up to two years and beyond. Unfortunately, a significant number of women failed to reach their stated goal duration. At the time of follow-up, one out of every three had already discontinued breastfeeding. This is a trend seen consistently throughout the literature as well and underlines the primary purpose of this study (Adams et al., 2001; Chezem et al., 2003; McLeod, Pullon, & Cookson, 2002; Odom et al., 2013).

A secondary purpose of this study was to look at patient variables and associated goal-attainment rates. There was no difference in breastfeeding rates between patients who reported success in the past compared to those with no previous breastfeeding

experience. However, women who reported a “poor previous experience” were less likely to be breastfeeding at the time of follow-up. This suggests that having a “poor previous experience” is associated with higher early cessation rates than having “no experience.”

While there was no concrete pattern between age groups, a curious trend was seen based on education levels. According to this study, women who completed high school and those who completed college were more likely to be on track to meeting their breastfeeding goal duration at 10 weeks postpartum when compared to women who reported “some college.” While the underlying cause of this trend is unknown, it does suggest that women who start, but do not finish, college may be at higher risk of early breastfeeding cessation.

Finally, an interesting and significant pattern was found when looking at the impact of the prenatal breastfeeding plan on goal attainment. The data show that patients who had planned in the prenatal period to breastfeed exclusively were more likely to still be breastfeeding at 10 weeks compared to the group who had planned to both breast- and formula-feed from the beginning. This is significant because it suggests that women who plan to breastfeed exclusively, even if they do eventually supplement with formula, tend to breastfeed longer and are more likely to reach their goal duration compared to those who plan to supplement with formula from the start.

Critique of the Data

Many of the results found in this study are similar to those seen throughout the literature while other results varied somewhat. For example, the sample in this study had

a tendency to have longer breastfeeding goals than those seen in the literature. Adams et al. (2001) found that the median breastfeeding goal among women is approximately six months. In this study the median breastfeeding goal was 12 months with many subjects reporting that they wished to breastfeed up to two years and beyond. According to the IFPS II raw data, pregnant women plan to breastfeed, on average, a total of 9.6 months (CDC, 2014b). In this study, the average breastfeeding goal was nearly 12 months.

Perrine et al. (2012) found that 85% of mothers want to breastfeed exclusively for at least three months. In this study, 75% reported that they planned to breastfeed their infant exclusive breastmilk.

On the other hand, this study also helped to underline and emphasize the continued issue with how many women fail to reach their breastfeeding goals. Many studies have found that about half of women do not meet their goal breastfeeding duration (Adams et al., 2001; Chezem et al., 2003; McLeod et al., 2002; Odom et al., 2013). The exclusive breastfeeding rates in this sample are similar to those published by the United States Breastfeeding Committee (USBC, 2015). Within this sample, half of women had failed to reach their exclusive breastfeeding goals at 10 weeks. Likewise, Perrine et al. (2012) found that only about 45% of mothers who had planned to exclusively breastfeed (greater than three months) were successful.

Chezem et al. (2003) found that the method of infant feeding had a significant impact on whether a mother met her breastfeeding goal. According to their research, mothers who choose breastfeeding and formula feeding are less likely to reach their intended breastfeeding duration compared to women who choose to exclusively

breastfeed. This supports the findings here that women who choose both formula- and breastfeeding were more than twice as likely to have early cessation of breastfeeding at 10 weeks postpartum. This is consistent with evidence that states early formula supplementation is associated with higher rates of early breastfeeding cessation (Chantry et al., 2014; Howard et al., 2003; Vogel et al., 1999).

In this study, women who were between 30 to 35 years old were least likely to be breastfeeding at 10 weeks postpartum. However, several other studies have found that, in general, a younger age is associated with a higher risk of early breastfeeding cessation (Ruowei et al., 2008; Chezem et al., 2003). The cause of this discrepancy is most likely multifactorial and may be related to differences in breastfeeding support, ethnicity, or education among the different age groups. When looking at ethnicity, in the literature those who reported as white or Caucasian planned to breastfeed longer than those who were black or African American or Hispanic ethnicity (CDC, 2014). In this population, the primary ethnicities are Caucasian and Native American. In this study, at 10 weeks postpartum, Caucasian women were more likely to be on track to meeting their goals than Native American women. While the underlying cause is unknown, it would be important to further investigate this occurrence in this region.

According to the results of this study, women who reported “some college” were most likely to have early breastfeeding cessation at 10 weeks postpartum. This is in contrast to the results of several other studies that found that the more formal education a mother has, the more likely she is to reach her breastfeeding goal in general (Chezem et al., 2003; Li, Fein, Chen, & Grummer-Strawn, 2008; Odom et al., 2013). This

discrepancy may be related to the time frame in which this study took place and the goals set by different educational groups. According to the Raw Data from the IFPSII, of mothers who completely stopped breastfeeding by three months postpartum, women who reported an education of “some college” were less likely to have breastfed their babies as long as they wanted to (CDC, 2014b), thus suggesting that, at this time period, women in the “some college” group are most at risk for breastfeeding cessation prior to reaching their goal.

Consistently throughout the literature, parity has been used to assess a woman’s risk for early breastfeeding cessation (Odom et al., 2013; Perrine et al., 2012). Unfortunately, the results have varied. For example, Odom et al. (2013) found that multiparous women were less likely to reach their goal. Alternatively, (Perrine et al., 2012), who took their results from the IFPS II, concluded that multiparous women were more likely to reach their breastfeeding goals. The results of this study are consistent with the latter. In general, from the IFPS II, women who were primiparous, planned to both breast- and formula-feed, reported “some college education,” and those who fell in the middle age groups (25–29 and 30–34) were less likely to breastfeed for as long as they wanted (CDC, 2014b).

Restrictions and Limitations

This study took place at only one prenatal clinic and, thus, the sample size was relatively small. Due to time constraints, only patients in the third trimester were recruited. They were given all three parts of the education at once rather than staggered

throughout their pregnancy as it was designed. No data was collected on patients who declined to participate in the study and no control group was used for comparison, therefore limiting the generalizability. Goals, previous success, and breastfeeding status were also self-reported by the patient and, therefore, at risk for reporting bias. There was a sample drop out of five subjects. Due to significant time constraints, however, the sample population did not receive early and ongoing, prenatal breastfeeding education, but rather received the entire toolkit in the third trimester, therefore, diminishing its effect on goal-attainment and breastfeeding rates.

Recommendation for Future Research

More studies are needed to look at barriers preventing the translation of breastfeeding research into practice; specifically provider, nursing, and administrative barriers. Additionally, more research is needed to evaluate breastfeeding goal attainment in at-risk populations such as Native American and rural populations.

This study highlights the potential relationship between patient-specific variables and goal attainment. Furthermore, it underscores the high rates of early breastfeeding cessation and the importance of prenatal breastfeeding education on goal attainment. Educational programs have been shown to be the single-most effective prenatal intervention to improve initiation and short-term duration of breastfeeding (Guisse et al., 2003). In this study, nurses played a critical role in educating patients about the benefits of breastfeeding and supporting them in their personal goals. Nurses also helped to initiate conversation with patients about their personal goals and how to reach them. This

toolkit provides information about the benefits of breastfeeding and the Ten Steps as well as resources in the community that can support breastfeeding mothers. Findings from this project support the need for a prenatal education program to improve goal attainment and breastfeeding duration. By providing patients with evidence-based, breastfeeding education, nurses can help to improve breastfeeding initiation, duration, exclusivity, and goal-attainment rates and, thereby, positively impact the health of mothers, infants, families, and the community as a whole.

Conclusion

The benefits of breastfeeding are well known and understood in the medical community. The American Academy of Pediatrics, the World Health Organization, and Healthy People 2020 have highlighted the importance of improving current breastfeeding initiation, duration, and exclusivity rates. Despite all the knowledge and controversy surrounding breastfeeding practices, more than half of mothers are still failing to reach their goals (Adams et al., 2001; Chezem et al., 2003; McLeod et al., 2002; Odom et al., 2013). The literature has outlined various healthcare practices, such as prenatal education, that can improve breastfeeding rates. The goal of this study was to implement an evidence-based, prenatal-education curriculum that was consistent with the standards of the Baby-Friendly Hospital Initiative to improve breastfeeding rates. This study found that over half of women in a small, northwestern hospital are failing to reach their goals. Planning to supplement with formula early-on was associated with twice the risk of early breastfeeding cessation prior to ten weeks postpartum.

The literature has shown that prenatal breastfeeding education increases initiation, short term duration, and exclusivity (Dyson et al., 2005; Guise et al., 2003; Mattar et al., 2007). Unfortunately, as this study lacked a control group, it is difficult to determine to what degree the education toolkit influenced goal attainment in this population. Due to the time constraints of this project, only women in the third trimester were recruited and, therefore, subjects did not benefit from early and ongoing prenatal breastfeeding education as set up in the toolkit. More research is needed to determine the effects of the toolkit on the barriers to breastfeeding goal attainment as well as the efficacy of prenatal education on long-term breastfeeding duration and exclusivity.

REFERENCES CITED

- AAP. (2015). Where we stand: Breastfeeding. Retrieved from <https://www.healthychildren.org/English/ages-stages/baby/breastfeeding/Pages/Where-We-Stand-Breastfeeding.aspx>
- Adams, C., Berger, R., Conning, P., Cruikshank, L., & Dore, K. (2001). Breastfeeding trends at a Community Breastfeeding Center: an evaluative survey. *J Obstet Gynecol Neonatal Nurs*, 30(4), 392-400.
- Anderson, J. W., Johnstone, B. M., & Remley, D. T. (1999). Breast-feeding and cognitive development: a meta-analysis. *Am J Clin Nutr*, 70(4), 525-535.
- Bartick, M. C., & Reinhold, A. G. (2010). The burden of suboptimal breastfeeding in the United States: a pediatric cost analysis. *Pediatrics*, 125(5), e1048-1056. doi:10.1542/peds.2009-1616
- Bartick, M. C., Stuebe, A. M., Schwarz, E. B., Luongo, C., Reinhold, A. G., & Foster, E. M. (2013). Cost analysis of maternal disease associated with suboptimal breastfeeding. *Obstet Gynecol*, 122(1), 111-119. doi:10.1097/AOG.0b013e318297a047
- Britton, C., McCormick, F. M., Renfrew, M. J., Wade, A., & King, S. E. (2007). Support for breastfeeding mothers. *Cochrane Database Syst Rev*(1), CD001141. doi:10.1002/14651858.CD001141.pub3
- CDC. (2014a). Breastfeeding report card. *United States: Outcome indicators*. Retrieved from <http://www.cdc.gov/breastfeeding/pdf/2014breastfeedingreportcard.pdf>
- CDC. (2014b). Infant feeding practices study and its six follow-up. Retrieved from <https://www.cdc.gov/breastfeeding/data/ifps/results.htm>.
- CDC. (2016). Breastfeeding report card. Retrieved from http://www.cdc.gov/nchs/data/nvsr/nvsr64/nvsr64_12.pdf
- Chantry, C. J., Dewey, K. G., Pearson, J. M., Wagner, E. A., & Nommsen-Rivers, L. A. (2014). In-hospital formula use increases early breastfeeding cessation among first-time mothers intending to exclusively breastfeed. *J Pediatr*, 164(6), 1339-1345 e1335. doi:10.1016/j.jpeds.2013.12.035

- Chezem, J., Friesen, C., & Boettcher, J. (2003). Breastfeeding knowledge, breastfeeding confidence, and infant feeding plans: effects on actual feeding practices. *J Obstet Gynecol Neonatal Nurs*, 32(1), 40-47.
- Chung, M., Raman, G., Trikalinos, T., Lau, J., & Ip, S. (2008). Interventions in primary care to promote breastfeeding: an evidence review for the U.S. Preventive Services Task Force. *Ann Intern Med*, 149(8), 565-582.
- DiGirolamo, A. M., Grummer-Strawn, L. M., & Fein, S. B. (2008). Effect of maternity-care practices on breastfeeding. *Pediatrics*, 122 Suppl 2, S43-49. doi:10.1542/peds.2008-1315e
- Dyson, L., McCormick, F., & Renfrew, M. J. (2005). Interventions for promoting the initiation of breastfeeding. *Cochrane Database Syst Rev*(2), CD001688. doi:10.1002/14651858.CD001688.pub2
- Eidelman, A. I. (2012). Breastfeeding and the use of human milk: an analysis of the American Academy of Pediatrics 2012 Breastfeeding Policy Statement. *Breastfeed Med*, 7(5), 323-324. doi:10.1089/bfm.2012.0067
- Gagnon, A. J., Leduc, G., Waghorn, K., Yang, H., & Platt, R. W. (2005). In-hospital formula supplementation of healthy breastfeeding newborns. *J Hum Lact*, 21(4), 397-405. doi:10.1177/0890334405280835
- Gregory, K. E., Dubois, N., & Steele, T. (2014). Nutritional and immunological considerations relevant to infant nutrition. *J Perinat Neonatal Nurs*, 28(1), 80-86. doi:10.1097/JPN.0000000000000015
- Guisse, J. M., Palda, V., Westhoff, C., Chan, B. K., Helfand, M., Lieu, T. A., & Force, U. S. P. S. T. (2003). The effectiveness of primary care-based interventions to promote breastfeeding: systematic evidence review and meta-analysis for the US Preventive Services Task Force. *Ann Fam Med*, 1(2), 70-78.
- Gwinn, M. L., Lee, N. C., Rhodes, P. H., Layde, P. M., & Rubin, G. L. (1990). Pregnancy, breast feeding, and oral contraceptives and the risk of epithelial ovarian cancer. *J Clin Epidemiol*, 43(6), 559-568.
- Hannula, L., Kaunonen, M., & Tarkka, M. T. (2008). A systematic review of professional support interventions for breastfeeding. *J Clin Nurs*, 17(9), 1132-1143. doi:10.1111/j.1365-2702.2007.02239.x

- Howard, C. R., Howard, F. M., Lanphear, B., Eberly, S., deBlieck, E. A., Oakes, D., & Lawrence, R. A. (2003). Randomized clinical trial of pacifier use and bottle-feeding or cupfeeding and their effect on breastfeeding. *Pediatrics*, 111(3), 511-518.
- Ip, S., Chung, M., Raman, G., Chew, P., Magula, N., DeVine, D., . . . Lau, J. (2007). Breastfeeding and maternal and infant health outcomes in developed countries. *Evid Rep Technol Assess (Full Rep)*(153), 1-186.
- Jackson, K. M., & Nazar, A. M. (2006). Breastfeeding, the immune response, and long-term health. *J Am Osteopath Assoc*, 106(4), 203-207.
- Johnson, K. (2013). Maternal-Infant Bonding: A Review of Literature. *International Journal of Childbirth Education*, 28(3).
- Khreshneh, R., Suhaimat, A., Jalamdeh, F., & Barclay, L. (2011). The effect of a postnatal education and support program on breastfeeding among primiparous women: a randomized controlled trial. *Int J Nurs Stud*, 48(9), 1058-1065. doi:10.1016/j.ijnurstu.2011.02.001
- Kramer, M. S., Aboud, F., Mironova, E., Vanilovich, I., Platt, R. W., Matush, L., . . . Promotion of Breastfeeding Intervention Trial Study, G. (2008). Breastfeeding and child cognitive development: new evidence from a large randomized trial. *Arch Gen Psychiatry*, 65(5), 578-584. doi:10.1001/archpsyc.65.5.578
- Kramer, M. S., Chalmers, B., Hodnett, E. D., Sevkovskaya, Z., Dzikovich, I., Shapiro, S., . . . Group, P. S. (2001). Promotion of Breastfeeding Intervention Trial (PROBIT): a randomized trial in the Republic of Belarus. *JAMA*, 285(4), 413-420.
- Labbok, M. H. (2001). Effects of breastfeeding on the mother. *Pediatr Clin North Am*, 48(1), 143-158.
- Le Huerou-Luron, I., Blat, S., & Boudry, G. (2010). Breast- v. formula-feeding: impacts on the digestive tract and immediate and long-term health effects. *Nutr Res Rev*, 23(1), 23-36. doi:10.1017/S0954422410000065
- Li, R., Fein, S. B., Chen, J., & Grummer-Strawn, L. M. (2008). Why mothers stop breastfeeding: mothers' self-reported reasons for stopping during the first year. *Pediatrics*, 122(Supplement 2), S69-S76.

- Lumbiganon, P., Martis, R., Laopaiboon, M., Festin, M. R., Ho, J. J., & Hakimi, M. (2012). Antenatal breastfeeding education for increasing breastfeeding duration. *Cochrane Database Syst Rev*(9), CD006425. doi:10.1002/14651858.CD006425.pub3
- Mattar, C. N., Chong, Y. S., Chan, Y. S., Chew, A., Tan, P., Chan, Y. H., & Rauff, M. H. (2007). Simple antenatal preparation to improve breastfeeding practice: a randomized controlled trial. *Obstet Gynecol*, 109(1), 73-80. doi:10.1097/01.AOG.0000249613.15466.26
- McLeod, D., Pullon, S., & Cookson, T. (2002). Factors influencing continuation of breastfeeding in a cohort of women. *J Hum Lact*, 18(4), 335-343.
- Newcomb, P. A., Storer, B. E., Longnecker, M. P., Mittendorf, R., Greenberg, E. R., Clapp, R. W., . . . MacMahon, B. (1994). Lactation and a reduced risk of premenopausal breast cancer. *N Engl J Med*, 330(2), 81-87. doi:10.1056/NEJM199401133300201
- Odom, E. C., Li, R., Scanlon, K. S., Perrine, C. G., & Grummer-Strawn, L. (2013). Reasons for earlier than desired cessation of breastfeeding. *Pediatrics*, 131(3), e726-732. doi:10.1542/peds.2012-1295
- Orem, D. E. (2003). *Self-care Theory in Nursing: Selected Papers of Dorathea Orem*: Springer Publishing Company.
- Otsuka, K., Taguri, M., Dennis, C. L., Wakutani, K., Awano, M., Yamaguchi, T., & Jimba, M. (2014). Effectiveness of a breastfeeding self-efficacy intervention: do hospital practices make a difference? *Matern Child Health J*, 18(1), 296-306. doi:10.1007/s10995-013-1265-2
- Perrine, C. G., Scanlon, K. S., Li, R., Odom, E., & Grummer-Strawn, L. M. (2012). Baby-Friendly hospital practices and meeting exclusive breastfeeding intention. *Pediatrics*, 130(1), 54-60. doi:10.1542/peds.2011-3633
- Renfrew, M. J., McCormick, F. M., Wade, A., Quinn, B., & Dowswell, T. (2012). Support for healthy breastfeeding mothers with healthy term babies. *Cochrane Database Syst Rev*(5), CD001141. doi:10.1002/14651858.CD001141.pub4
- Rosen, I. M., Krueger, M. V., Carney, L. M., & Graham, J. A. (2008). Prenatal breastfeeding education and breastfeeding outcomes. *MCN Am J Matern Child Nurs*, 33(5), 315-319. doi:10.1097/01.NMC.0000334900.22215.ec

- TJC. (2016). Perinatal care. Retrieved from http://www.jointcommission.org/perinatal_care/default.aspx
- USBC. (2015). Healthy People 2020: Breastfeeding objectives. Retrieved from <http://www.usbreastfeeding.org/LegislationPolicy/FederalPoliciesInitiatives/HealthyPeople2020BreastfeedingObjectives/tabid/120/Default.aspx>
- Vogel, A., Hutchison, B. L., & Mitchell, E. A. (1999). Factors associated with the duration of breastfeeding. *Acta Paediatr*, 88(12), 1320-1326.
- WHO. (1991). Indicators for assessing breast feeding practices. *WHO Geneva, Switzerland: WHO Document WHO/CDD/SER*, 91, 14.
- WHO. (1998). Evidence for the ten steps to successful breastfeeding. Retrieved from <http://apps.who.int/iris/handle/10665/43633>
- Wolfberg, A. J., Michels, K. B., Shields, W., O'Campo, P., Bronner, Y., & Bienstock, J. (2004). Dads as breastfeeding advocates: results from a randomized controlled trial of an educational intervention. *Am J Obstet Gynecol*, 191(3), 708-712.
doi:10.1016/j.ajog.2004.05.019

APPENDICES

APPENDIX A

UNITED STATES BREASTFEEDING RATES

United States Breastfeeding Rates

Appendix A: Data taken from the 2014 CDC Breastfeeding Report Card and Healthy People 2020 Objectives.

Measure	<u>Ever Breastfed</u>			<u>Exclusively Breastfed</u>	
	Ever BF	BF at 6 mo	BF at 12 mo	Exclusive BF at 3 mo	Exclusive BF at 6 mo
U.S. National	79.2	49.4	26.7	40.7	18.8
Montana	91.2	50.7	25.5	53.4	19.3
HP 2020 Target	81.9	60.6	34.1	46.2	25.5

APPENDIX B

TEN STEPS TO SUCCESSFUL BREASTFEEDING

Ten Steps to Successful Breastfeeding

Appendix B: Taken from the WHO (1998), Evidence for the ten steps to successful breastfeeding, Division of Child Health and Development, Geneva.

1. Have a written breastfeeding policy that is routinely communicated to all healthcare staff.
2. Train all healthcare staff in skills necessary to implement this policy.
3. Inform all pregnant women about the benefits and management of breastfeeding.
4. Help mothers initiate breastfeeding within a half-hour of birth.
5. Show mothers how to breastfeed and how to maintain lactation, even if they should be separated from their infants.
6. Give newborn infants no food or drink other than breast milk unless medically indicated.
7. Practice rooming-in—allow mothers and infants to remain together—24 hours a day.
8. Encourage breastfeeding on demand.
9. Give no artificial teats or pacifiers (also called dummies or soothers) to breastfeeding infants.
10. Foster the establishment of breastfeeding support groups and refer mothers to them on discharge from the hospital or clinic.

APPENDIX C

THIRD TRIMESTER PRENATAL BREASTFEEDING SURVEY

Third Trimester Prenatal Breastfeeding Survey

Thank you for agreeing to fill out this quick survey. Your participation is greatly appreciated. Please answer the following questions as best you can and turn this sheet in to your nurse.

1. Will this be your first birth? - If this is your first birth, mark NA on questions 2 & 3.
YES NO
2. Have you breastfed previously?
YES NO NA- No previous births
3. If you have breastfed in the past- did you have success meeting your breastfeeding goals previously?
YES NO NA- No previous births
4. What is your expected due date? _____
5. What is your current age? _____
6. What is your current level of education?
Less than high school High school Some college College degree
7. How would you describe your ethnicity?
Caucasian Native American Hispanic African American Asian
Other_____
8. The education you are receiving today is the third trimester section of a 3-trimester education series. What sections of this education series have you received (circle all that apply).
First Trimester Second Trimester Third Trimester
9. How do you plan to feed your newborn? (circle one)
Breastfeeding only Both formula and breastfeeding Formula feeding only
10. Which nurse or provider offered today's education to you?

11. If you plan to either only breastfeed, or both formula and breastfeed, how long would you like to breastfeed? Please list your breastfeeding goal in weeks (1month ~ 4 weeks).

12. Please list your first name and the best phone number(s) we can contact you at. This follow up call will take place at about 8 weeks postpartum. Your information will be kept completely confidential.