Empowering Primary Care Providers in Rural Clinics with Breastfeeding Education

by

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Abstract

Background: Early initiation of patient education regarding the benefits of breastfeeding correlates with improved long-term outcomes for mothers and children as well as decreased environmental and healthcare costs. Significant health, financial, environmental, and psychosocial risks are directly associated with not initiating and sustaining breastfeeding. The lack of primary care provider comfort in providing breastfeeding support demonstrated the need for the project.

Purpose: This project aimed to evaluate whether integrating breastfeeding education and addressing common breastfeeding MythBusters increases primary care providers' knowledge, attitudes, and confidence levels in educating expectant mothers in southwestern Virginia.

Methods: The quasi-experimental design guided the project with a pre-test and post-test partnered with a breastfeeding educational webinar. Breastfeeding education included in this project was targeted toward breastfeeding benefits, breastfeeding MythBusters, and the top reasons for early breastfeeding cessation. The Iowa Infant Feeding Attitude Scale (IIFAS) and the Breastfeeding Knowledge, Attitude, and Confidence scale (BKACs) were integrated into the pre-test and post-test to measure the attitudes, knowledge, and confidence of healthcare professionals in educating expecting mothers in rural clinics.

Clinical Implications: This project demonstrated an increase in the knowledge and confidence levels of primary care providers (PCPs) and nurses when initiating a discussion on breastfeeding education with pregnant patients in the first trimester of pregnancy in the rural primary care setting.

Keywords: breastfeeding education, breastfeeding cessation, rural areas, nurses, and primary care providers

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Chapter 1: Introduction

Early initiation of patient education regarding the benefits of breastfeeding correlates with long-term improved outcomes for mothers and children as well as decreased environmental and healthcare costs (Campbell et al., 2019; Hale & Hartmann, 2017; Wambach & Riordan, 2016). Out of 98 countries, the United States ranked 86 regarding effectively promoting and supporting breastfeeding (World Breastfeeding Trends Initiative, 2022). Professional healthcare provider support has a positive influence over the decision to breastfeed (Campbell et al., 2019; Guise et al., 2003; Hale & Hartmann, 2017; Wambach & Riordan, 2016). Increasing the knowledge of healthcare professionals regarding the health benefits of breastfeeding and how to manage common breastfeeding problems is imperative (Campbell et al., 2019; United States Preventive Services Task Force [USPSTF], 2016; Wambach & Riordan, 2016). The delivery of consistent information by healthcare professionals about breastfeeding is a Grade B level recommendation by the USPSTF, indicating breastfeeding education prenatally is a highly recommended service (USPSTF, 2016). Primary care providers (PCPs) should promote breastfeeding, provide information on how to breastfeed, and support breastfeeding during pregnancy and postpartum for obstetric patients and their families (Radzyminski et al., 2015; United States Department of Health and Human Services [DHHS], 2011; USPSTF, 2016).

Exclusive breastfeeding is when newborns and infants only receive breastmilk or expressed breastmilk for nutrition without additional supplementation, except for the recommended vitamin D 400 International Units (IU) (Centers for Disease Control and Prevention, 2021, para. 3; Cox, 2015, p. 31). According to the annual Global Breastfeeding Scorecard, the exclusive breastfeeding rate in infants less than 6 months is 20-40% in 41

countries, including the United States (Global Breastfeeding Collective, 2022). Within the United States, approximately 25.6% of infants are exclusively breastfeeding at 6 months of life per the Breastfeeding Report Card, a biennial report of collected breastfeeding data (Centers for Disease Control and Prevention, 2020).

The short- and long-term benefits of breastfeeding are extensive for mothers and infants (Campbell et al., 2019; Wambach & Riordan, 2016). Women can decrease the risk of ovarian cancer, breast cancer, uterine cancer, type 2 diabetes mellitus, hypertension, rheumatoid arthritis, osteoporosis, cardiovascular disease, myocardial infarction, hyperlipidemia, obesity, and metabolic syndrome by breastfeeding (American College of Obstetricians and Gynecologists [ACOG], 2018; Bartick et al., 2017; Campbell et al., 2019; Hale & Hartmann, 2017; Ross-Cowdery et al., 2016; Wambach & Riordan, 2016). Exclusive breastfeeding helps the woman return to her pre-pregnancy weight and spacing of the next child's birth (ACOG, 2018).

In addition to the maternal benefits, there are benefits of breastfeeding for the infant as well. The breastfeeding benefits for infants include decreased risk for respiratory, gastrointestinal, and ear infections (Bartick et al., 2017; Campbell et al., 2019; Centers for Disease Control and Prevention, 2021; DHHS, 2011; Hale & Hartmann, 2017; Wambach & Riordan, 2016). Breastfeeding premature infants decreases the risk of developing necrotizing enterocolitis, a life-threatening disease of the neonate's intestines (Bartick et al., 2017; Campbell et al., 2019; Centers for Disease Control and Prevention, 2021; DHHS, 2011; Hale & Hartmann, 2017; Wambach & Riordan, 2016). Additionally, breastfed infants have a lower risk of dental malocclusions (Bartick et al., 2017; Campbell et al., 2019; Hale & Hartmann, 2017; Wambach & Riordan, 2016). Breastfeeding also decreases the risk of some cancers in infants, such as leukemia and neuroblastomas (Centers for Disease Control and Prevention, 2021; DHHS, 2011).

Asthma, atopic dermatitis, otitis media, type 1 and type 2 diabetes mellitus, diarrhea, colic, sudden infant death syndrome, and obesity rates are decreased in breastfed children (Bartick et al., 2017; Campbell et al., 2019; Centers for Disease Control and Prevention, 2021; Hale & Hartmann, 2017; Wambach & Riordan, 2016).

Formula feeding poses increased risks of contaminated formula and incorrect preparation of the formula (Bartick et al., 2017). For example, in March 2022, the Food and Drug Administration recalled Similac formulas prepared by Abbott due to contamination with Cronobacter sakazakii, resulting in two infant deaths (Torchinsky, 2022). Due to the recall of formula preparations, the United States is facing a formula shortage (Centers for Disease Control and Prevention, 2022; DHHS, 2022). For parents who exclusively formula feeding their child, the formula shortage could make it difficult to feed their child adequately and safely.

The exclusive breastfeeding rate (EBR) for Virginia's infants through at least 6 months of life is 30.4% (Centers for Disease Control and Prevention, 2020). Although higher than the national average, the lack of investment in breastfeeding support for both prenatal and postpartum women and their families can cause a lack of breastfeeding initiation or early cessation, leading to health problems for both the mother and infant and increased healthcare costs (ACOG, 2018; Bartick et al., 2017; Campbell et al., 2019; Hale & Hartmann, 2017; Sanchez et al., 2019; Wambach & Riordan, 2016; Yeh et al., 2020). The Virginia EBR is well below the recommended guidelines of exclusive breastfeeding through at least 6 months for all infants (ACOG, 2018; World Health Organization [WHO], 2021; Centers for Disease Control and Prevention, 2020; Global Breastfeeding Collective, 2022). A goal of Healthy People 2030 is to increase the EBR through 6 months of life in the infant to at least 42.9% of the population by the year 2030 (Office of Disease Prevention and Health Promotion [ODPHP], 2021).

Significance

The significant benefits of early initiation of breastfeeding education and low EBRs support the need for additional education of PCPs in rural clinics within Virginia (Beake et al., 2012; Brown et al., 2022; Coffman, 2019; Ramos et al., 2019; Rosen-Carole et al., 2015, 2020). Primary care providers and nurses can have an influential role in the initiation of breastfeeding and continued support to decrease the detrimental health effects, psychosocial effects, economic effects, and environmental effects of not breastfeeding (Campbell et al., 2019; Coffman, 2019; DHHS, 2011; Hale & Hartmann, 2017; Wambach & Riordan, 2016).

Maternal psychosocial effects of not breastfeeding include decreased bonding between the mother and neonate along with an increased risk of postpartum depression (DHHS, 2011). Psychologically, mood and affect improve in women who choose to breastfeed (Krol & Grossmann, 2018). Children of mothers who breastfeed score higher on intelligence tests and have higher cognitive development skills, such as better memory, language, and motor skills (Krol & Grossmann, 2018). Exclusive breastfeeding is also associated with improved social and emotional development in children (Krol & Grossmann, 2018). Becoming dependent on formula could lead to a lack of nutrition for infants due to the formula supply shortage (DHHS, 2022).

The environmental effects of not breastfeeding are an increase in formula packages, leading to the accumulation of plastic packaging in landfills (DHHS, 2011). The formula also must be transported from the manufacturer's warehouse to the location where the producers will sell the formula, which will also play a part in adverse environmental effects (DHHS, 2011). Artificial milk formula production contributes to climate change through gas emissions in the greenhouse where the formula is produced (Smith, 2019). Exclusive breastfeeding does not contribute to environmental waste (Smith, 2019).

Breastfeeding affects the economy nationwide in positive ways. Exclusive breastfeeding for at least 6 months by 90% of women and children in the United States would save over $14 billion every year due to a reduction in medical care for diseases directly impacting the morbidity and mortality rates of mothers and children (Bartick et al., 2017). The WHO (2021) estimated optimal breastfeeding or exclusive breastfeeding for 6 months could save the lives of over 820,000 children annually. In addition, breastfeeding for 6 months could save over 20,000 maternal lives from breast cancer (McFadden et al., 2017; WHO, 2021). Even though the Women, Infants, and Children (WIC) programs utilized in state health departments promote breastfeeding, WIC will distribute formulas for free to qualifying mothers who request formula for their infant (WIC, 2022). Bonyata (2019) estimated the cost of formula feeding would be approximately $1,662.22 for 6 months for individuals who do not qualify for WIC and must pay out-of-pocket costs for formula.

Professional support by practitioners includes education on the benefits of breastfeeding (ACOG, 2018). Increasing healthcare professionals' knowledge of breastfeeding health benefits and management of common breastfeeding problems is imperative to close the gap between the lack of education on breastfeeding management and the lack of consistent information given to breastfeeding mothers and their families (Coffman, 2019; DHHS, 2011; Radzyminski et al., 2015;). Furthermore, the USPSF supports primary care providers by providing interventions regarding breastfeeding education to help initiate, support, sustain, and prevent early cessation of breastfeeding (Chesnel et al., 2021; USPSTF, 2016). Increasing breastfeeding education for primary care providers in rural clinics is imperative to increase early initiation and longer duration of breastfeeding, thus leading to improved outcomes for mothers and infants (Coffman, 2019; USPSTF, 2016; Witt et al., 2019).

Quality Improvement

Quality improvement (QI) projects focus on gathering knowledge to improve patient care delivery by meeting specific standards of care (Holly, 2014). The benefits of QI are the results are rapid, and there is no risk to the patients, allowing key stakeholders to quickly identify what processes need improvement in the practice area (Holly, 2014). This project utilized an educational webinar to educate PCPs and primary care nurses on the benefits of breastfeeding education. The breastfeeding webinar was led by an international board-certified lactation consultant (IBCLC) via Zoom teleconferencing technology. The breastfeeding webinar included information on breastfeeding benefits, common breastfeeding issues, and MythBusters in breastfeeding. Participants were provided with a reproducible breastfeeding brochure outlining maternal and child benefits of breastfeeding. The PCP or nurse was encouraged to provide the brochure to the patient when they choose to initiate the breastfeeding conversation. The Plan-Do-Check-Act (PDCA) methodology for QI will guide the project to ensure clear objectives. With PDCA, developing an implementation plan can lead to a successful evaluation of the project's results (Holly, 2014).

Purpose

Healthcare providers and nurses lack confidence in providing breastfeeding education, which directly relates to a lack of knowledge about breastfeeding health benefits and inability to manage common breastfeeding issues (Brown et al., 2022; Patterson et al., 2020). When PCPs facilitate breastfeeding education in conjunction with breastfeeding support, there is a direct correlation with increased breastfeeding initiation and duration (Casal et al., 2017; Guise et al., 2003). Moreover, healthcare professional students lack breastfeeding education in their curriculums, which leads to limited breastfeeding knowledge (Yang et al., 2018). Using surveys,

Meek et al. (2020) found that physicians across multiple specialties wanted further breastfeeding education to increase their confidence in providing information and support for breastfeeding patients and their families. In addition, prenatal breastfeeding education enhances mothers' knowledge and attitudes toward breastfeeding (Abuidhail et al., 2019). Since PCPs are a point of first medical care contact for patients in rural areas, this project will focus on empowering primary care providers in small rural clinics with breastfeeding education (Guise et al., 2003).

When healthcare providers integrate team-based breastfeeding support into their practice for mothers and infants, breastfeeding duration and exclusivity rates increase (Witt et al., 2019). Healthcare providers and nurses have crucial roles in influencing breastfeeding initiation and duration, yet breastfeeding education and knowledge are lacking, demonstrating a need for increased breastfeeding education (Radzyminski & Callister, 2015). Healthcare providers' improper management of breastfeeding pain can lead to premature breastfeeding cessation, especially when women receive conflicting, incorrect information (Radzyminski & Callister, 2015; Strong, 2011). Primary care providers caring for women and infants often did not provide consistent, evidence-based information for breastfeeding pain and adequate breastfeeding supportive resources (Strong, 2011). Primary care providers and nurses are in a vital position to positively affect the initiation, continuation, and duration of exclusively breastfeeding (Strong, 2011). Patterson et al. (2020) found the Academy of Breastfeeding Medicine (ABM) encourages primary care offices to provide breastfeeding education to staff. Breastfeeding education is a way to identify breastfeeding difficulties, provide breastfeeding support, and recognize when to refer the individual to an IBCLC (Patterson et al., 2020).

Increasing breastfeeding initiation is positively correlated with early breastfeeding education for expectant mothers prenatally (Huang et al., 2019). The breastfeeding webinar

proposed in this quality improvement project included breastfeeding education such as breastfeeding benefits, good latch, and positioning techniques. Additional topics covered were physical signs that the infant is getting enough milk, management of painful nipples, mastitis, breast engorgement, breastfeeding and maternal medications, and insufficient milk supply management. In the project, an IBCLC addressed breastfeeding MythBusters. Some of the MythBusters included:

1. "Formula has the same health benefits as breastmilk."
2. "If I eat certain foods, I can increase my milk supply."
3. "I need to pump and dump."
4. "I cannot breastfeed if I am sick."
5. "Breastfeeding is easy."
6. "I cannot breastfeed and take medication."
7. "I cannot breastfeed while pregnant with another child."
8. "I have to keep my baby on a feeding schedule." (Prussack, 2019)

PICO and Research Questions

This quality improvement project evaluated whether integrating breastfeeding education and addressing common breastfeeding MythBusters increased primary care providers' knowledge, attitudes, and confidence levels in educating expectant mothers in small, rural clinics. PICO: In primary care providers and nurses that practice in small rural clinics (P), how does providing breastfeeding education (I) compared to no education (C) affect their knowledge, attitudes, and confidence (O) in initiating breastfeeding education for patients?

Definition of Variables and Key Terms

Understanding the key terms and variables to be measured is imperative to understand the significance of the project. The key words focused on in this project include *International Board-*

Certified Lactation Consultants (IBCLCs), exclusive breastfeeding, prenatal breastfeeding education, primary care providers (PCPs), and *nurses.*

1. IBCLCs are professional clinicians that are internationally certified and considered experts in providing lactation support, identifying and correcting problems before they lead to early cessation of breastfeeding, and referring clients to other specialties when deemed necessary (International Board of Lactation Consultant Examiners, 2017).
2. Exclusive breastfeeding is "No other liquid or solid from any other source enters the infant's mouth," besides the recommended vitamin D 400 International Units (IU) for exclusively breastfed infants and infant medications (Centers for Disease Control and Prevention, 2021, para. 3; Cox, 2015, p. 31).
3. Prenatal breastfeeding education is information provided by an individual qualified to deliver correct, up-to-date information on breastfeeding to initiate and sustain lactation, thus promoting women and their newborns' health (ACOG, 2021; Centers for Disease Control, n.d.). Therefore, breastfeeding education for primary care providers can be defined as "factual information, support, and management to assist the individual with the initiation and duration of breastfeeding" (Centers for Disease Control, n.d., para. 1).
4. Primary care providers (PCPs) can be "physicians (MD or DO), nurse practitioners, and physician assistants" who offer care to numerous individuals, including pregnant women (Cleveland Clinic, 2022).

5. Nurses are considered licensed professionals with a background in nursing, which includes promoting health and disease prevention while simultaneously caring for ill individuals in all healthcare settings (The International Council of Nurses, 2022).

Theoretical Framework

The transitions theory guided the project. Dr. Afaf Meleis' transitions theory focuses on helping individuals "transition" to their new roles, such as birth and becoming parents (Meleis, 2010). A personal facilitator to a transition is the preparation and knowledge, which directly relates to patients' information during pregnancy regarding breastfeeding (Meleis, 2010). Providing breastfeeding education for primary care providers and nurses in rural clinics empowered them with breastfeeding knowledge and demonstrated the relationship to the transitions theory. The transition theory assisted providers to initiate a conversation about breastfeeding benefits with patients in the first trimester of pregnancy (Meleis, 2010). Meleis (2010) described how transitions involve patterns, properties, facilitators and inhibitors, and responses to the change. Barimani et al. (2017) used Meleis' transition theory in a qualitative study using interviews of subjects to evaluate facilitators and inhibitors with the transition to being parents. Primary care providers can use this middle-range theory to support breastfeeding education in patients' first trimester, guiding patients concerning infant feeding choices, and advising of the health benefits of breastfeeding (Meleis, 2010). The organizational transition occurred at the small, rural health clinics that agreed to participate in this project (Meleis, 2010). Primary care providers and nurses achieved an awareness that breastfeeding education promotes breastfeeding initiation and sustainability (Meleis, 2010). The PCPs in rural clinics engaged in the transition by participating in breastfeeding education and integrating it into their current practice (Meleis, 2010). Over time, PCPs' knowledge and confidence in breastfeeding education

should grow and influence their patients' initiation and continuation of breastfeeding (Meleis, 2010).

Summary of Chapter

Primary care providers who integrated breastfeeding support and education into their primary care practice found it was the most effective intervention for increasing breastfeeding initiation and duration (Guise et al., 2003). If an individual can exclusively breastfeed their neonate for 6 months, the research estimates $14 billion would be saved in healthcare costs each year in the United States (Radzyminski & Callister, 2015). Therefore, professional support remains paramount for encouraging breastfeeding initiation and duration (Radzyminski & Callister, 2015). According to the interviewed healthcare professionals, they identified areas of weakness, which included a lack of breastfeeding knowledge, lack of consistent information, and the inability to manage common difficulties in breastfeeding (Radzyminski & Callister, 2015). Healthcare providers found one barrier to initiating breastfeeding education was the lack of their personal breastfeeding knowledge, which deterred them from discussing breastfeeding information with their patients (Radzyminski & Callister, 2015). The proposed project will target the gaps in current healthcare providers' practice of early initiation of breastfeeding education for expectant mothers by increasing the primary care providers' knowledge of breastfeeding education.

When the provider's knowledge of the subject at hand is improved, they are more likely to be confident enough to promote and support the topic, which is breastfeeding (Radzyminski & Callister, 2015). The significance of not initiating, supporting, and sustaining breastfeeding is a plethora of detrimental health risks for both the mother and neonate (DHHS, 2011). Furthermore, according to the U.S. Department of Health and Human Services (2011), not breastfeeding has

harmful psychosocial, economic, and environmental effects. Therefore, education is the key to closing the gap in knowledge and future practice of primary care providers.

Chapter 2: Integrated Review of the Literature

Overview

The literature review assessed evidence-based practice related to breastfeeding support and prenatal breastfeeding education concerning exclusive breastfeeding rates. A review of the literature supports breastfeeding due to the vast number of health benefits for both the mother and child. Meta-analyses are an excellent way for clinicians to evaluate a clinical question and appraise multiple articles at once to help them develop the best evidence-based practice interventions for their patients (Melnyk & Fineout-Overholt, 2019). The systematic review of the literature will assist the researcher in identifying gaps that exist in the research, thus leading to the development of a more precise PICOT question (Holly, 2014). The top factors influencing breastfeeding initiation and continuation included maternal education, breastfeeding education, smoking, mode of delivery, parity, and dyad separation (Cohen et al., 2018). Therefore, addressing the knowledge of PCPs and nurses related to breastfeeding education practicing in small rural clinics in an effort to influence breastfeeding initiation and duration is imperative.

Review of Literature

Literature Selection

An initial search was conducted of the National Library of Medicine with PubMed using keywords such as breastfeeding, prenatal breastfeeding education telemedicine, the effect of IBCLC on exclusive breastfeeding rates, breastfeeding support, increasing exclusive breastfeeding rates in rural areas, factors influencing breastfeeding, and primary care providers. The PubMed database resulted in 1,465 articles. Next, a search of the Cumulative Index of

Nursing and Allied Health Literature (CINHAL) resulted in 175 results using the key terms breastfeeding and telemedicine and the effect of prenatal breastfeeding education. Finally, the literature review searched Google Scholar using the keywords effect of prenatal breastfeeding education on exclusive breastfeeding rates and primary care providers, resulting in 17,200 results.

Synthesis and Critique

The literature review resulted in 16 articles that met the keywords and inclusion criteria of English language and peer-reviewed journals within the last 5 years. The three common themes included breastfeeding education's effects on breastfeeding initiation and duration, primary care provider (PCP) and nurse role in breastfeeding education, and management of breastfeeding challenges. These themes all support the project's goals, which is to increase breastfeeding education in primary care for women in their first trimester.

Effects of Breastfeeding Education on Breastfeeding Initiation and Duration

Research teams and authors assessed the independent variable of prenatal breastfeeding education and the effect on breastfeeding exclusivity rates, knowledge, attitudes towards breastfeeding, and self-efficacy in postpartum women (Abuidhail et al., 2019; Tseng et al., 2020; Yeh et al., 2020). Exclusive breastfeeding rates at 6 months postpartum were significantly higher in those who received prenatal breastfeeding education (You et al., 2020). Utilizing technology and the internet for pregnant individuals to educate them on the benefits of breastfeeding was very effective at increasing their self-efficacy with breastfeeding (Abuidhail et al., 2019). Again, technology can be a powerful tool in providing lactation support. Researchers found two iPad-based breastfeeding interventions for pregnant individuals to be statistically influential in increasing breastfeeding initiation and breastfeeding EBRs (Farr et al., 2019). Prenatal

breastfeeding education and professional support are essential as both significantly increase the initiation and duration of breastfeeding (Yeh et al., 2020).

In contrast, the dependent variable studied in 11 of the research studies was exclusive breastfeeding rates (Abuidhail et al., 2019; Addicks & McNeil, 2019; Farr et al., 2019; Jerin et al., 2020; Sanchez et al., 2019; Schindler-Ruwisch & Phillips, 2021; Tseng et al., 2020; Uscher-Pines et al., 2020; Yeh et al., 2020; Zhu et al., 2017). The exclusive breastfeeding rates at discharge, 6 weeks, 4 months, and 6 months postpartum were all found to be greater in the intervention group who received breastfeeding education, confirmed with statistical significance through the p-value (You et al., 2020). Prenatal Motivational Interviewing (MI) increased positive attitudes regarding breastfeeding, leading to an increase in individuals still breastfeeding one month postpartum (Addicks & McNeil, 2019). Mobile phone support increased exclusive breastfeeding rates by 20% in the intervention group (Jerin et al., 2020). Virtual breastfeeding support is essential, especially during a pandemic like a coronavirus, as virtual lactation visits help individuals sustain their breastfeeding journeys (Schindler-Ruwisch & Phillips, 2021). Exclusive breastfeeding rates were more significant in those individuals and infants who received on-site IBCLC support services at a primary care practice clinic (Sanchez et al., 2019).

Primary Care Provider (PCP) and Nurse Role in Breastfeeding Education

Barimani et al. (2017) stated an inhibiting factor to breastfeeding was healthcare professionals giving conflicting information regarding when to cease breastfeeding for infant safety. Thus, providing consistent, accurate information to women and their families on breastfeeding by healthcare professionals, specifically primary care providers, is pivotal (Barimani et al., 2017; Coffman, 2019). In addition, increased knowledge about breastfeeding is

imperative when providing education on medication and safety in the infant to prevent early, unnecessary cessation of breastfeeding (Hale, 2021).

Initiating breastfeeding education to patients in the first trimester of pregnancy can profoundly impact breastfeeding initiation and its duration (Barimani et al., 2017; Wambach & Riordan, 2016). In addition, professional support was a facilitating factor in breastfeeding initiation and continuation (Barimani et al., 2017; Wambach & Riordan, 2016). Therefore, both PCPs and nurses play a crucial role when considering breastfeeding education in small, rural clinical settings (Barimani et al., 2017).

Furthermore, researchers found that a barrier to breastfeeding initiation was the lack of professional information and support regarding breastfeeding for the patient (Barimani et al., 2017). Other inhibiting factors included inconsistent breastfeeding education, lack of rapport with the healthcare professional, and no support for breastfeeding challenges for the patient from the healthcare provider (Barimani et al., 2017; Coffman, 2019). Integration of MI and psychoeducation sessions into primary care practices in Appalachian clinics can increase breastfeeding exclusivity rates, self-efficacy, and the mother's intention to breastfeed (Addicks & McNeil, 2019).

Management of Breastfeeding Challenges

You et al. (2020) demonstrated that researchers were correct in their hypothesis that when IBCLCs give interventions for breastfeeding women, exclusive breastfeeding rates and breastfeeding self-efficacy will increase. Two studies evaluated the relationship between facilitating and inhibiting factors in breastfeeding and the transition to parenthood (Barimani et al., 2017; Bookhart et al., 2021). Four of the studies discussed establishing telehealth services for lactation support (Jerin et al., 2020; Kapinos et al., 2019; Schindler-Ruwisch & Phillips, 2021;

Uscher-Pines et al., 2020). Zhu (2017) used the theory of planned behavior (TPB) as their independent variable, whereas Farr (2019) implemented two iPad-based breastfeeding interventions with the end goals of both studies to improve breastfeeding exclusivity and rates. In one study, the dependent variable discovered breastfeeding challenges and telelactation satisfaction rates after implementing telelactation services in rural areas (Kapinos et al., 2019). Difficulty with latch, nipple pain, and perceived insufficient milk supply were all reasons individuals weaned prematurely, demonstrating the need for continued support and intervention when individuals are facing breastfeeding challenges and want to continue breastfeeding (ACOG, 2021).

Gap Identification and Project Applicability

The project helped close the gap in the practice when an IBCLC delivered breastfeeding education and determined whether this intervention increased primary care providers' and nurses' knowledge and confidence in providing breastfeeding education to their patients. The proposed project focused on breastfeeding education for primary care providers since individuals who receive breastfeeding support and education prenatally have a subsequent increase in exclusive breastfeeding rates. There remains a gap in the practice of implementing breastfeeding education for primary care providers by an IBCLC in the Appalachian area. The project focused specifically on breastfeeding benefits and MythBusters in breastfeeding education (Prussack, 2019). Additionally, a gap exists in the research with IBCLCs providing breastfeeding education for primary care providers in rural clinics and how this affects breastfeeding initiation and continuation. The project focused on increasing primary care providers' and nurses' knowledge of breastfeeding education in small, rural clinics to positively influence breastfeeding initiation and duration. Based on evidence-based research, as breastfeeding initiation and duration rates

increase, mother and children's health outcomes will be positively affected (Abuidhail et al., 2019; Addicks & McNeil, 2019; Bartick et al., 2017; Coffman, 2019; Farr et al., 2019; Huang et al., 2019; Jerin et al., 2020; Krol & Grossmann, 2018; Patterson et al., 2020; Sanchez et al., 2019; Tseng et al., 2020; Walters et al., 2019; Witt et al., 2019; Yang et al., 2018).

Organization and Summary of Studies

Educating Providers and Nurses on Breastfeeding Education

The most effective intervention is breastfeeding education for the initiation and duration of breastfeeding (Guise et al., 2003). There is limited foundational breastfeeding education provided in the healthcare professional students' academic programs. Healthcare providers can positively influence a mother's decision to initiate breastfeeding. The proposed project will address the gaps in their education (Yang et al., 2018). There is a direct link between breastfeeding education and support for both initiation and continuation of breastfeeding (Cohen et al., 2018). When individuals receive breastfeeding support and education prenatally, a subsequent increase in exclusive breastfeeding rates follows.

By empowering primary care providers and nurses with increased confidence in their breastfeeding knowledge, they can take the information and disseminate it to pregnant mothers to raise their breastfeeding initiation, self-efficacy, and learning (Abuidhail et al., 2019). Utilization of an IBCLC for lactation consults in a family clinic was found to improve exclusive breastfeeding rates and breastfeeding duration (Sanchez et al., 2019). Therefore, targeting primary care providers in underserved, rural clinics will improve outcomes for mothers and children in the long term. As evidenced in the literature, professional support is crucial to extending the breastfeeding journey, thus decreasing maternal and neonatal health risks (DHHS, 2011; Radzyminski et al., 2015).

Breastfeeding Benefits

Providing clear and consistent education on breastfeeding benefits prenatally to parents is critical (American College of Gynecologists [ACOG], 2018; Campbell et al., 2019). The World Health Organization (WHO, 2021) estimated optimal breastfeeding or exclusive breastfeeding for 6 months could save the lives of over 820,000 children. Breastfeeding decreases a child's risk of ear infections, urinary tract infections, and respiratory diseases, such as pneumonia and bronchitis (Campbell et al., 2019; Hale & Hartmann, 2017; Mohrbacher & Kendall-Tackett, 2010; Wambach & Riordan, 2016). The reduction of sudden infant death syndrome, diarrhea, and dental malocclusions occurs in children who breastfeed (Campbell et al., 2019; Hale & Hartmann, 2017; Wambach & Riordan, 2016). Both the lactating parent and the breastfed infant have a statistically lower chance of developing type 2 diabetes mellitus later in life (Campbell et al., 2019; Hale & Hartmann, 2017; Wambach & Riordan, 2016). According to Campbell et al. (2019), the risk of developing breast cancer is reduced by 4.3% with every 12 months of breastfeeding. Breastfeeding for 6 months could save over 20,000 maternal lives from breast cancer (McFadden et al., 2017; WHO, 2021;). In comparison, the risk of developing ovarian cancer is reduced by 28% at 6 months of breastfeeding (Campbell et al., 2019). The probability of having hypertension, obesity, and cardiovascular disease decreases in the individual who lactates and breastfeeds (Campbell et al., 2019; Hale & Hartmann, 2017; Wambach & Riordan, 2016). Exclusive breastfeeding for 6 months correlates with lactational amenorrhea (Campbell et al., 2019; Wambach & Riordan, 2016). Lactational amenorrhea can help with the spacing of pregnancies (Campbell et al., 2019; Wambach & Riordan, 2016). The risks of developing asthma and allergies decreased in those children who breastfed (Hale & Hartmann, 2017; Mohrbacher & Kendall-Tackett, 2010; Wambach & Riordan, 2016). The risk for developing childhood cancers

decreased from 24% to 41% with breastfeeding (Hale & Hartmann, 2017). These cancers include Hodgkin's disease, acute leukemia, neuroblastomas, and acute lymphoblastic leukemia (Hale & Hartmann, 2017). Health benefits from breastfeeding are in abundance.

Latch and Positioning Techniques

Achieving an effective latch with breastfeeding is imperative in the prevention of nipple pain, nipple trauma, and inadequate transfer of the milk to the infant (Campbell et al., 2019; Mohrbacher & Kendall-Tackett, 2010; Wambach & Riordan, 2016). Recommendations are to achieve an asymmetrical latch when latching by lining the infant's nose up to the nipple with the chin first and head tilted back a little (Mohrbacher & Kendall-Tackett, 2010). Signs of an effective latch include both the upper and lower lips being flanged outward, the mouth being wide open, the chin is touching the breast, and the tongue being below the breast, and the individual has no nipple pain or nipple trauma after breastfeeding (Campbell et al., 2019; Mohrbacher & Kendall-Tackett, 2010; Wambach & Riordan, 2016). Signs of an ineffective latch include tight lips, lower lips pulled inward, dimpling of the infant's cheeks, nipple pain, and a misshapen and flattened nipple after breastfeeding (Campbell et al., 2019). There are multiple nursing positions available for breastfeeding, including laid-back breastfeeding, Madonna or cradle hold, cross-cradle hold, clutch or football hold, and side-lying (Campbell et al., 2019; Wambach & Riordan, 2016). The laid-back position is beneficial immediately after delivery, post-cesarean section, and for individuals with difficulty achieving a latch (Campbell et al., 2019). The Madonna or cradle hold is the most frequently used breastfeeding position (Campbell et al., 2019; Wambach & Riordan, 2016). The cross-cradle hold accommodates infants who need extra assistance with latching onto the breast (Campbell et al., 2019; Wambach & Riordan, 2016). The clutch or football hold is helpful for a new mother to observe the latch directly or if

the mother had a cesarean delivery or for larger breasts (Campbell et al., 2019; Wambach & Riordan, 2016). The side-lying position is beneficial for fatigued individuals and those experiencing pain from episiotomy or hemorrhoids (Campbell et al., 2019; Wambach & Riordan, 2016). Ensuring proper position and latch can help prevent painful nipples (Campbell et al., 2019; Wambach & Riordan, 2016).

Management of Painful Nipples

One of the top reasons for early cessation of breastfeeding is breastfeeding pain (Campbell et al., 2019; Radzyminski & Callister, 2015; Strong, 2011). Understanding how to treat nipple pain is vital for promoting the continuation of breastfeeding (Campbell et al., 2019). Nipple pain and nipple trauma causes include an ineffective latch and breastfeeding position (Campbell et al., 2019). Other causes of nipple pain and trauma include infant ankyloglossia or "tongue-tie" and vasospasm (Campbell et al., 2019). Dermatologic conditions, infections, the wrong fit of pump flanges, and suction of pump set too high can all contribute to nipple damage (Campbell et al., 2019). Lanolin cream and all-purpose nipple ointment (composed of antibiotic, antifungal, and steroid) are equally effective treatments for nipple pain and nipple healing, breastfeeding duration and exclusivity, and maternal satisfaction (Campbell et al., 2019; U.S. National Library of Medicine, 2021). Expressed breastmilk heals and relieves pain from damaged nipples due to anti-inflammatory factors and antibodies, promoting healing and preventing further trauma (Wambach & Riordan, 2016). Primary care providers (PCPs) have a role in the early assessment, identification, and intervention of painful nipples to prevent unwanted premature cessation of breastfeeding (Wambach & Riordan, 2016).

Management of Breast Engorgement

Ineffective stimulation and drainage of milk can increase vascular flow leading to tissue edema and compressed blood vessels and milk ducts, causing breast engorgement (Campbell et al., 2019; Mohrbacher & Kendall-Tackett, 2010). Furthermore, difficulties with latch can cause breast engorgement due to ineffective milk removal (Campbell et al., 2019). Once engorgement is identified and appropriately treated, it lasts approximately 12-48 hours (Mohrbacher & Kendall-Tackett, 2010). There are two types of engorgements, primary and secondary engorgement (Campbell et al., 2019). Primary engorgement, or breast swelling, occurs when lactogenesis II or the onset of the abundance of milk production 3 to 5 days after childbirth (Campbell et al., 2019). In contrast, secondary engorgement correlates with established lactation, often due to inconsistent milk removal and production (Campbell et al., 2019). Reverse pressure softening is a highly effective technique to decrease swelling on the areola and allow for an easier latch and effective milk removal (Campbell et al., 2019; Mohrbacher & Kendall-Tackett, 2010). Management of breast engorgement includes breast massage before feeds and reverse pressure softening (Campbell et al., 2019; Mohrbacher & Kendall-Tackett, 2010). Ibuprofen is effective for pain caused by engorgement (Campbell et al., 2019; Mohrbacher & Kendall-Tackett, 2010). In addition, frequent breast stimulation can prevent milk stasis from engorgement, which, if left untreated, can lead to mastitis (Campbell et al., 2019; Mohrbacher & Kendall-Tackett, 2010).

Management of Mastitis

If engorgement is left untreated, it could lead to mastitis, an inflammatory disease of the breast that potentially can cause an infection or even an abscess (Campbell et al., 2019; McCance & Huether, 2019). Mastitis occurs due to milk stasis and duct distention, decreasing milk flow, thus allowing bacteria to infect the stagnant milk (Hale & Hartmann, 2017). Symptoms

associated with mastitis include fever and flu-like symptoms, such as headaches, fatigue, nausea, and muscle aches (Campbell et al., 2019). In addition, mastitis causes the breast to be painful, red, warm, and swollen and typically affects only one breast (Campbell et al., 2019; Hale & Hartmann, 2017). Nipple damage and engorgement are both causes of mastitis (Campbell et al., 2019). Staphylococcus aureus is the primary organism that causes mastitis. The first-line treatment includes penicillinase-resistant penicillin, such as Augmentin, Dycill, or Flucil, if the patient has no penicillin allergy (Campbell et al., 2019; Wambach & Riordan, 2016). Management of mastitis includes antibiotic treatment (if indicated), frequent emptying of breasts, breast massage, ibuprofen for pain, and a warm pack for the area of breast inflammation or infection (Campbell et al., 2019; Wambach & Riordan, 2016).

Insufficient Milk Supply

Milk production is directly related to "supply and demand," meaning the more the breasts get stimulated, the more milk the individual will produce (Campbell et al., 2019; Wambach & Riordan, 2016). Certain medications can decrease milk production, such as estrogens, bromocriptine, and progestins (Hale & Hartmann, 2017). Reglan is a medication associated with increased milk synthesis (Hale & Hartmann, 2017). The herbal galactagogue, Fenugreek, a capsule taken three times per day by mouth, showed promise in significantly increasing milk supply (Hale & Hartmann, 2017). A shallow latch can lead to the ineffective transfer of milk and production, meaning the infant may lose weight (Mohrbacher & Kendall-Tackett, 2010; Wambach & Riordan, 2016). Pacifiers can decrease the milk supply due to infrequent feedings due to pacifying the infant with the pacifier instead of placing the infant at the breast for stimulation and milk removal (Cox, 2015). Increasing milk production can be achieved by frequent feedings with the baby placed directly to the breast, ensuring the breast is completely

emptied (Wambach & Riordan, 2016). Since the endocrine system and a new pregnancy can negatively impact milk production, the PCP can check endocrine levels for potential pregnancy (Wambach & Riordan, 2016). During a breastfeeding session, the individual can simultaneously massage the breast as it contributes to increased milk supply (Campbell et al., 2019; Wambach & Riordan, 2016). A top reason for premature cessation of breastfeeding is perceived insufficient milk supply (Huang et al., 2019; Lewallen et al., 2006).

Breastfeeding and Maternal Medications

There are five lactation risk categories for maternal medications from L1-L5, with L1 being compatible, L2 probably compatible, L3 probably compatible, L4 potentially hazardous, and L5 defined as hazardous or contraindicated in breastfeeding (Armstrong, 2008; Bonyata, 2018; Hale, 2021). When considering breastfeeding and maternal medications, selecting a drug with a short half-life, high protein binding, low oral bioavailability, and the high molecular weight is essential (Hale, 2021). In addition, PCPs must provide the appropriate education to lactating mothers who need medication treatment but are concerned with infant safety (Colaceci et al., 2015). Therefore, providing consistent, accurate education can prevent premature cessation of breastfeeding due to the need to take medication (Colaceci et al., 2015).

Breastfeeding MythBusters

Top reasons for early breastfeeding cessation include perceived insufficient milk supply, painful nipples, and latch difficulties (Lewallen et al., 2006, p. 168). The Academy of Breastfeeding Medicine (ABM) posts free protocols to guide clinicians caring for breastfeeding mothers and infants (ABM, 2019). The ABM Clinical Protocol #19 addresses the importance of integrating breastfeeding education in the first trimester regarding recommendations of exclusive

breastfeeding for 6 months, breastfeeding benefits, and common barriers to breastfeeding (Rosen-Carole & Hartman, 2015).

The project will utilize an IBCLC to address breastfeeding MythBusters. These common breastfeeding myths frequently heard in practice include:

1. "Formula has the same health benefits as breastmilk."
2. "If I eat certain foods, I can increase my milk supply."
3. "I need to pump and dump."
4. "I cannot breastfeed if I am sick."
5. "Breastfeeding is easy."
6. "I cannot breastfeed and take medication."
7. "I cannot breastfeed while pregnant with another child."
8. "I have to keep my baby on a feeding schedule."

Integrating the promotion of breastfeeding education for primary care providers has been encouraged by both the ACOG and Healthy People 2020 (Radoff & Forman, 2019). However, the lack of formal lactation education that healthcare professionals receive could pose a risk to breastfeeding advocacy (Radoff & Forman, 2019).

Chapter 3: Methods

Implementation Plan

Project Design

The quality improvement project used a quasi-experimental design. Quasi-experiments include the intervention or independent variable while leaving out random assignment and control group (Melnyk & Fineout-Overholt, 2019, p. 628). The pre-test data evaluated PCPs and nurses' attitudes, confidence, and levels of knowledge regarding breastfeeding education and

breastfeeding MythBusters. Baseline data was obtained through the pre-tests, and then the research participant could receive an educational webinar on breastfeeding. The post-test was administered after the subjects participated in the breastfeeding education webinar. The Qualtrics surveys remained open for 6 weeks for the PCPs and nurses to participate. The primary investigator (PI) integrated the consent to participate in the study into the surveys and webinar sessions. The quasi-experimental study design was a practical and efficient method of delivery of the breastfeeding education webinar for the PCPs and nurses (Melnyk & Fineout-Overholt, 2019, p. 628). Due to the busy practice schedules, ample time was allowed for the subject participation to decide whether they wanted to participate in the project. To ensure all the PCPs and nurses had ample time to participate in the educational webinar, the breastfeeding education webinar was recorded via the Zoom teleconferencing technology with embedded pre- and post-education Qualtrics surveys for healthcare providers' convenience. The Iowa Infant Feeding Attitude Scale (IIFAS) and Breastfeeding Knowledge, Attitude, and Confidence scale (BKACs) surveys were administered via Qualtrics using a link distributed to the PCPs and nurses. The pre-test and post-test Qualtrics surveys took approximately 15 minutes total to complete. The pre-tests and post-tests were identical to evaluate the effectiveness of the breastfeeding education webinar provided by an IBCLC on PCPs' and nurses' attitudes towards breastfeeding and overall knowledge of breastfeeding.

Project Sample

Target Population and Organization

With an aim to increase PCPs' and primary care nurses' breastfeeding knowledge in small rural clinics in Southwest Virginia regarding the benefits of breastfeeding, the quality improvement project focused on the target population of PCPs and primary care nurses located at

the Tri-Area Community Health clinics at Ferrum, Floyd, Grayson Highlands, and Laurel Fork, Virginia. These locations serve the counties of Carroll, Floyd, Franklin, Grayson, Patrick, and the City of Galax (Tri-Area Community Health, 2021). The Tri-Area Community Health clinics are all Federally Qualified Health Centers (FQHCs). The four Tri-Area Community Health Centers provide quality healthcare to individuals (Tri-Area Community Health, 2021). Each clinic receives grant funding from the Health Resources & Services Administration (HRSA) Bureau of Primary Health Care (Tri-Area Community Health, 2021). The mission statement aligns directly with the goals of the project proposal: "Our mission is to improve the quality of life of our patients and our communities by providing affordable, high-quality, comprehensive care and services" (Tri-Area Community Health, 2021). The chief executive officer (CEO) of Tri-Area Community Health, James L. Werth, Jr., Ph.D., ABPP, as a major stakeholder supported the implementation of this project to take place in the Ferrum, Floyd, Grayson Highlands, and Laurel Fork.

Sample Access

Power analysis decreased the odds of a type II error happening in the study and ensures a significant enough sample size (Melynk & Fineout-Overholt, 2019, p. 640). Setting the alpha to 0.05 with the two-tailed test and a power of 0.80 identified an appropriate effect size for the project (Kim et al., 2022). The effect size was estimated using a sample size calculator, which found approximately 16 providers and nurses needed to participate in the project to be an adequate sample (ClinCalc, 2022). The convenience sample was obtained of a total of 16 providers and nurses from the Tri-Area Community Health Centers (FQHCs) located at four different locations: Ferrum, Floyd, Grayson Highlands, and Laurel Fork.

Sample Recruitment

The sample was a convenience sample of 16 primary care providers (PCPs) from Tri-Area Community Health Centers, consisting of doctor of nursing practice (DNPs), family nurse practitioners (FNPs), doctor of osteopathic medicine (DOs), medical doctors (MDs), physician assistants (PAs), and certified pediatric nurse practitioners (CPNPs). Each PCP at the Tri-Area Community Health Centers has an assigned registered nurse (RN) or licensed practical nurse (LPN) who had direct patient contact and the opportunity to initiate breastfeeding education. There were 53 total eligible candidates. Therefore, the primary care nurses received an invitation to participate in the project. The researcher sent an email with a flyer detailing the quality improvement project to eligible healthcare providers inviting them to participate in the project. The email described the project in detail, including the risks, benefits, and data protection. Invited participants were informed that they can drop out of the project at any time without consequences, and their participation was strictly voluntary. Sending the email invitation out in advance allowed for sufficient time for the sample subjects to evaluate the decision of project participation.

Inclusion and Exclusion Criteria

Individuals eligible for participation in this project included PCPs and nurses located at the Tri-Area Community Health Center. Participants had to be 18 years or older and licensed healthcare professionals, whether primary care providers or licensed nurses. Exclusion criteria included secretarial staff, laboratory staff, behavioral health staff, medical assistants, and schedulers. Other staff members excluded included janitors and sales representatives. The convenience sample was aimed at PCPs and nurses as they have the chance to directly influence the initiation of breastfeeding in mothers in the first trimester of pregnancy.

Protection of Human Subjects

To protect the rights of these human subjects, the researcher acquired Intuitional Review Board (IRB) approval through Radford University before the project's implementation (Appendix J). Dr. James Werth, Jr., CEO of the Tri-Area Community Health clinics, had provided written support for the project (Appendix I). Dr. Werth expects to continue offering breastfeeding education in the Tri-Area Community Health clinics after the completion of the project. Informed consent of participants was obtained by the individual clicking, "Yes, I want to participate in this project and thoroughly understand the risks, benefits, and my rights to opt-out of the project at any time." Clicking the query in the Qualtrics survey stating the participants agree to the project gave informed consent prior the start of the pre-test (Appendix G). The researcher maintained the project participants' confidentiality and followed the IRB rules for protecting subjects by allowing participants in the project to choose their own four-digit confidential, unidentifiable ID number using their last digit of phone number, number for month of birth, number for second digit of date of birth, and last digit of year of birth. According to the Office of Human Research Protections, the proposed research falls under expedited IRB approval as it involves an educational intervention involving adults (DHHS, 2021).

Increasing knowledge of breastfeeding education is one of the benefits of participating in this project. Another advantage of the project is that all participants received a breastfeeding brochure on breastfeeding benefits to hand out to patients in the first trimester of pregnancy, in the anticipation of influencing the patient's decision to initiate breastfeeding. A master template for the breastfeeding brochure was available for easy reproduction. Furthermore, those individuals who chose to participate had the opportunity to learn about common MythBusters in breastfeeding from an IBCLC and how to address these in the primary care practice. There are no

more risks of participating in the study than would be experienced in everyday life. Although there was no linking of identifying information with participants, there was still a risk since the breastfeeding webinar and the pre-test and post-test surveys occurred online. Once the survey data got downloaded, the researchers immediately deleted IP addresses to protect the research subjects. Researchers did not collect identifying information. Data collected during the project was secured and password protected on the PI's laptop. Data will be stored for the 3-year minimum. The PI and the student researcher had access to the data.

Instruments

Variable Definitions

PCPs and nurses' attitudes, confidence, and knowledge were operationally defined through the pretest and posttest data using IIFAS and BKACs. Demographic information included type of terminal degree of the healthcare provider, the number of years of experience, age, race/ethnicity, level of education, and gender were all demographic variables that were collected.

Instrument Details

The IIFAS is a reliable tool, with a Cronbach's alpha of .85 to .86 (Addicks & McNeil, 2019; Mora et al., 1999). In addition, Casal et al. (2017) found the IIFAS tool valid in over 27 published research studies. For a research study results to be accurate, the tools or instruments measuring the variables need to be validated and reliable (Kim et al., 2022). For example, reliability refers to the tools consistently producing the same measured results (Kim et al., 2022). Not only has the IIFAS been found valid but also reliable (Addicks & McNeil, 2019; Casal et al., 2017; Mora et al., 1999).

The IIFAS used a 5-point Likert scale (strongly disagree, disagree, neither agree nor disagree, agree, or strongly agree) that consists of 17 items. In 1999 de la Mora et al. developed the IIFAS (Mora et al., 1999). Using the instrument before and after the breastfeeding education intervention will evaluate the project participants' attitudes toward breastfeeding and formula-feeding (Mora et al., 1999). Thus, the IIFAS gave baseline data on attitudes towards breastfeeding and formula-feeding (Mora et al., 1999). In addition, it showed that PCPs and nurses' attitudes changed post the breastfeeding education webinar. Finally, the instrument guided data collection for the independent variable, the breastfeeding education webinar delivered by an IBCLC, assessed the project participants' attitudes regarding infant feeding preference before breastfeeding education and after the webinar. Scores on the IIFAS range from a low of 17 to a high of 85 (Mora et al., 1999). The higher scores on the IIFAS correlated to more positive attitudes towards breastfeeding (Mora et al., 1999).

The BKACs is a reliable tool with a Cronbach's alpha of 0.84 (Casal et al., 2016). There are 87 items on a 4-point Likert scale, including 26 for knowledge, 25 for attitude, and 20 for confidence (Laantera et al., 2010). Adapting the tool helped the PI evaluate PCPs' and nurses' knowledge and confidence levels with breastfeeding education. In 2010, Sari Laantera, Anna-Maija Pietila, and Tarja Polkki developed the BKACs to best assess breastfeeding knowledge (Laantera et al., 2010). The higher scores on the BKACs correlate to an increased level of knowledge (Casel et al., 2016; Laantera et al., 2010). Therefore, using the BKACs instrument demonstrated a need for increased lactation education (Casal et al., 2016; Laantera et al., 2010).

Procedure

Interventions

The breastfeeding education included in this project focused on breastfeeding benefits, good latch, and positioning techniques. Also, the breastfeeding webinar delivered by Zoom technology consisted of physical signs of the neonate is getting enough milk, management of painful nipples, mastitis, breast engorgement, breastfeeding and maternal medications, and management of insufficient milk supply. The project was facilitated by an IBCLC and addressed breastfeeding MythBusters, which included "Formula has the same health benefits as breastmilk," "If I eat certain foods, I can increase my milk supply," "I need to pump and dump," "I cannot breastfeed if I am sick," "Breastfeeding is easy," "I cannot breastfeed and take medication," "I cannot breastfeed while pregnant with another child," and "I have to keep my baby on a feeding schedule." Top reasons for early breastfeeding cessation include perceived insufficient milk supply, painful nipples, and latch difficulties (Lewallen et al., 2006, p. 168). There was a breastfeeding brochure provided to all participants, written at an eighth-grade reading level. A PowerPoint developed by an IBCLC guided the Zoom teleconferencing technology delivery of breastfeeding education webinar. The webinar lasted approximately 20 minutes. Participants accessed the recorded breastfeeding education webinar through the Zoom link provided in the information about the project sent out via email to potential participants.

Budget Plan

The budget for this project was feasible and sustainable. Approximately $30 was necessary for the ink and paper needed for the printed brochures on breastfeeding benefits for pregnant patients in the first trimester. There was an electronic master template of the breastfeeding brochure for mass producing and edits. In addition, the primary investigator utilized Zoom teleconferencing technology combined with Qualtrics surveys to implement the breastfeeding webinar. For PCP and nurse convenience, the breastfeeding webinar had a live and

pre-recorded session for ease of staff participation. However, to achieve the research subject "buy-in," the student researcher had received Dr. Werth's, CEO of the four Tri-Area Community Health Centers, support for the project to occur at his rural primary care facilities, and he offered to place the project on his monthly training calendar as optional training for qualified staff to attend. These staff members include DNPs, FNPs, DOs, MDs, PAs, CPNPs, RNs, and LPNs.

Sustainability

For the sustainability of this quality improvement project after the initial implementation, Tri-Area Community Health Clinic PCPs and nurses must be willing to initiate prenatal breastfeeding education in the first trimester of pregnancy. Over time, the PCPs and nurses will continue the transition to an engrained practice of the initiation of breastfeeding education in a patient's first trimester, thus supporting the initiation and duration of exclusive breastfeeding (Meleis, 2010). Once the PCPs and nurses note the impact that the QI project can have on positive health outcomes for both the lactating mother and the breastfeeding infant, the QI project can be continued and sustained by the clinics. For knowledge reinforcement, the PowerPoint education from the breastfeeding webinar will be freely accessible once the project is complete.

Data Collection

The primary investigator maintained the project participants' confidentiality and followed the IRB rules for protecting subjects by allowing participants in the project to choose their own four-digit confidential, unidentifiable ID number using their last digit of phone number, number for month of birth, number for second digit of date of birth, and last digit of year of birth. The breastfeeding education webinar was live online via Zoom teleconferencing technology, recorded live via Zoom, and accessible for anyone unable to attend the live Zoom session and still wanted

to participate in the project. Recording the breastfeeding education webinar ensured that the informational content was delivered the same way to each healthcare professional who chose to participate in the quality improvement project.

Data Management

The SPSS software was utilized to evaluate the data, and calculated if the breastfeeding education webinar was statistically significant at increasing attitudes, confidence, and knowledge in providing breastfeeding education to patients. If there was missing data and the researcher deems it appropriate, they could clean the data to prevent errors (Kim et al., 2022). In addition, if there were significant outliers in the data collection, the researcher could remove these results to appropriately analyze the data (Kim et al., 2022). The SPSS software was a way to guarantee the PI eradicated any data collection errors.

Data Analysis

Paired t-tests were chosen to evaluate the data and allowed for comparison in means for both the attitudes before and after implementing the prenatal breastfeeding program and comparison of the pre-test and post-test data. Logistic regressions were utilized to examine the independent variable. For example, a breastfeeding education webinar provided by an IBCLC increases providers' and nurses' knowledge of the implementation of breastfeeding education in the woman's first trimester of pregnancy (Kim et al., 2022, p. 200). The PI used a pre-established p-value of .05 and appraised the statistical significance of the proposed study results (Kim et al., 2022). The chi-square test analyzed the relationship between the highest degree obtained and PCPs' and nurses' knowledge and confidence related to breastfeeding (Kim et al., 2022).

Chapter 4: Results

The project evaluated whether integrating a breastfeeding education webinar led by an IBCLC increased PCPs' knowledge, attitudes, and confidence levels in the education of expectant mothers in small, rural clinics. Prior research demonstrates that the knowledge of PCPs and nurses in small, rural clinics increased concerning the benefits of breastfeeding provided in the first trimester for expectant mothers and the initiation of breastfeeding education to the patient vastly improved (Chesnel et al., 2021; Coffman, 2019; Radzyminski et al., 2015; Witt et al., 2019). Does breastfeeding education increase the PCPs' and nurses' knowledge, attitudes, and confidence to initiate breastfeeding education in their practice for their patients?

Description of the Sample

The sample size consisted of 16 volunteer participants from the small, rural clinics in Southwest Virginia included DNPs, MDs, LPNs, DOs, RNs with associate degrees, RNs with bachelor of science in nursing (BSN), and FNPs with master of science in nursing. The Qualtrics survey link was sent to Dr. Werth who then distributed the surveys to the nurses and PCPs at the Tri-Area Community Health clinics at Ferrum, Floyd, Grayson Highlands, and Laurel Fork, Virginia, by Dr. James L. Werth, Jr., Ph.D., ABPP, the CEO of Tri-Area Community Health. These four Tri-Area Community Health clinics are all FQHCs that receive grant funding from the HRSA Bureau of Primary Health Care (Tri-Area Community Health, 2021). Dr. Werth sent an initial invitation to eligible individuals, including 53 primary care providers and nurses.

The power analysis using the power of 0.80 yielded the need for 16 providers and nurses to participate for an adequate sample size (ClinCalc, 2022; Kim et al., 2022). Of the 53 eligible participants, 16 or 30.189% participated in the study. Of the 16 participants, 18.75% identified as male and 81.25% as female. Of the participants who chose to respond, 93.75% identified as

Caucasian. Only 6.25% of participants identified as Hispanic/Latino ethnicity. Sixteen primary care providers and nurses participated in the pre-webinar survey, and 16 completed the post-webinar survey.

When asked about the highest degree obtained, 25% of the participants were nurse practitioners. Only 6.25% were DNP providers. Whereas 18.75% of master prepared FNPs completed the surveys. Of the 16 survey participants, 12.5% identified as MDs. The doctor of osteopathic medicine was much rarer, at 6.25%. LPNs comprise 37.5% of survey respondents. The highest level of education for 18.75% of respondents was RN. Of the RNs, only 6.25% indicated they held a BSN degree.

Years of experience working as a PCP, or primary care nurse, ranged from 1 to 20 years' experience. The mean number of years working in primary care was 9.0625 years. The median number of years of experience in primary care was 6. The calculated mode of years of experience were 1 and 2 years, respectively, or 37.5%. Of the sample, 16 respondents, or 100%, currently work in a primary care setting.

The ages of the respondents ranged from 20 years of age to 63 years of age. The calculated mean age was 39.5 years, with a median age of 40.5. The range of age of respondents was 43 years or 6.25%. There were no identified age number outliers. The LPNs comprised the youngest participant at 20 years old and the oldest participant at 63, or 12.5% of respondents.

The survey also inquired about respondents' total years of practice as a DNP, FNP, DO, MD, PA, RN, or LPN. The mean number of years practicing in these roles was 10.6875 years of experience. The mode of years practicing as DNP, FNP, DO, MD, PA, RN, or LPN was 2 years' experience or 18.75% of the survey participants. The minimum and maximum amount of years' experience was held by two of the LPNs, with 1 year and 33 years, respectively, making up

12.5% of the results.

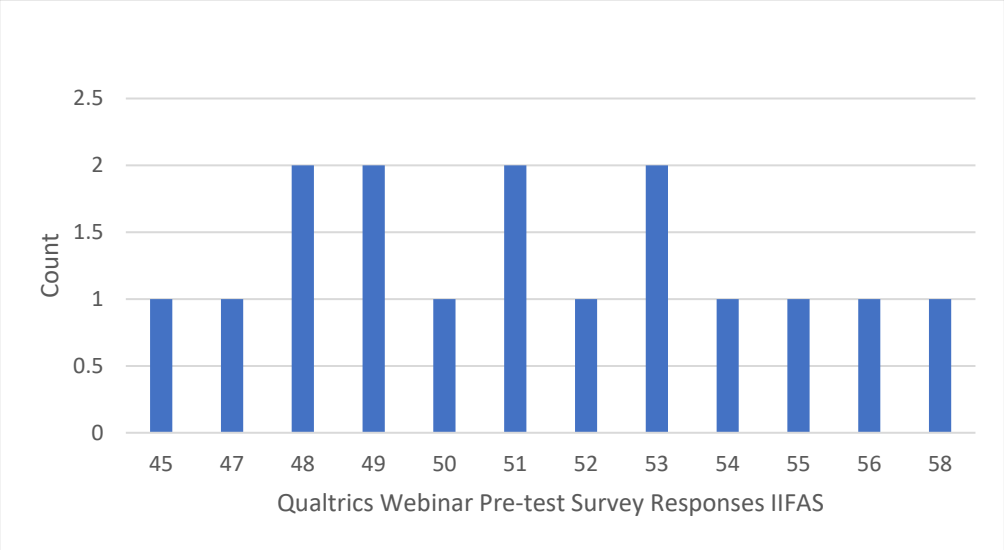
Description of Major Project Variables

Attitudes towards breastfeeding were compared in the pre- and post-breastfeeding webinar Qualtrics survey responses. The chi-square test analyzed the relationship between the participants' highest degree obtained and PCPs' and nurses' knowledge and confidence related to breastfeeding (Kim et al., 2022). The higher scores on the IIFAS (70-85) strongly correlates to a positive attitude toward breastfeeding. Neutral scores on the IIFAS ranged from 49-69. In contrast, scores indicating a positive attitude toward formula feeding ranged from 17 to 48 on the IIFAS (Casel et al., 2016; Mora et al., 1999). The Likert scale level choices included strongly disagree, disagree, neutral, agree, and strongly agree (Casel et al., 2016; Mora et al., 1999).

Figure 1 shows the results of the Qualtrics webinar pre-test survey responses on the IIFAS. The respondents' answers suggest a mean score of 51, demonstrating neutral attitudes towards breastfeeding. Four participants scored 45-48, indicating positive attitudes towards formula feeding.

Figure 1

Qualtrics Webinar Pre-Test Survey Responses: Iowa Infant Feeding Attitude Scale (IIFAS)



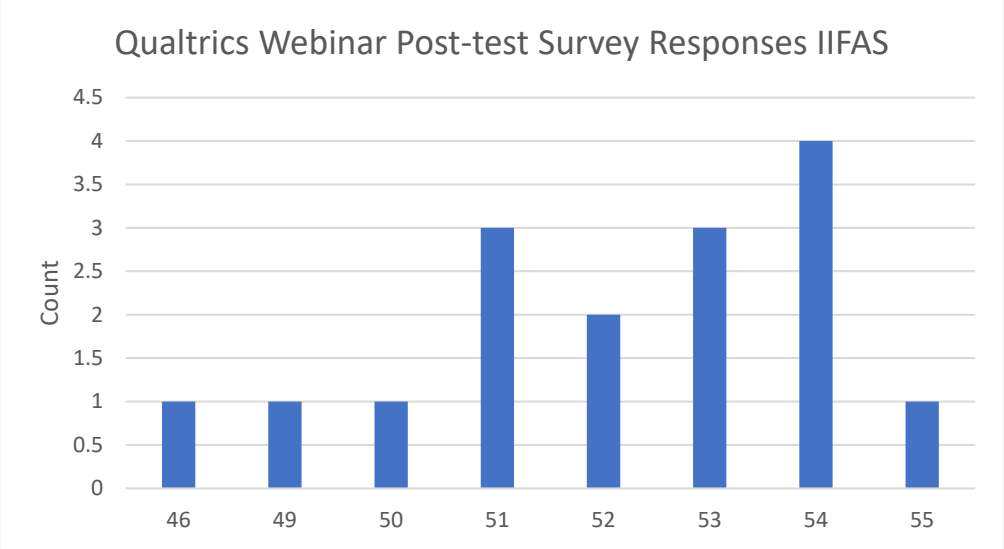
Descriptives

			Statistic	Std. Error
Qualtrics Webinar Pre-test Survey Responses IIFAS	Mean		51.1875	.88138
	95% Confidence Interval for Mean	Lower Bound	49.3089	
		Upper Bound	53.0661	
	5% Trimmed Mean		51.1528	
	Median		51.0000	
	Variance		12.429	
	Std. Deviation		3.52550	
	Minimum		45.00	
	Maximum		58.00	
	Range		13.00	
	Interquartile Range		5.50	
	Skewness		.209	.564
	Kurtosis		-.475	1.091

Figure 2 shows the results of the Qualtrics webinar post-test survey responses on the IIFAS. The respondents' answers suggest a mean score of 52, demonstrating neutral attitudes towards breastfeeding. Two respondents scored 46 and 49, respectively, indicating positive attitudes towards formula feeding.

Figure 2

Qualtrics Webinar Post-Test Survey Responses: Iowa Infant Feeding Attitude Scale (IIFAS)



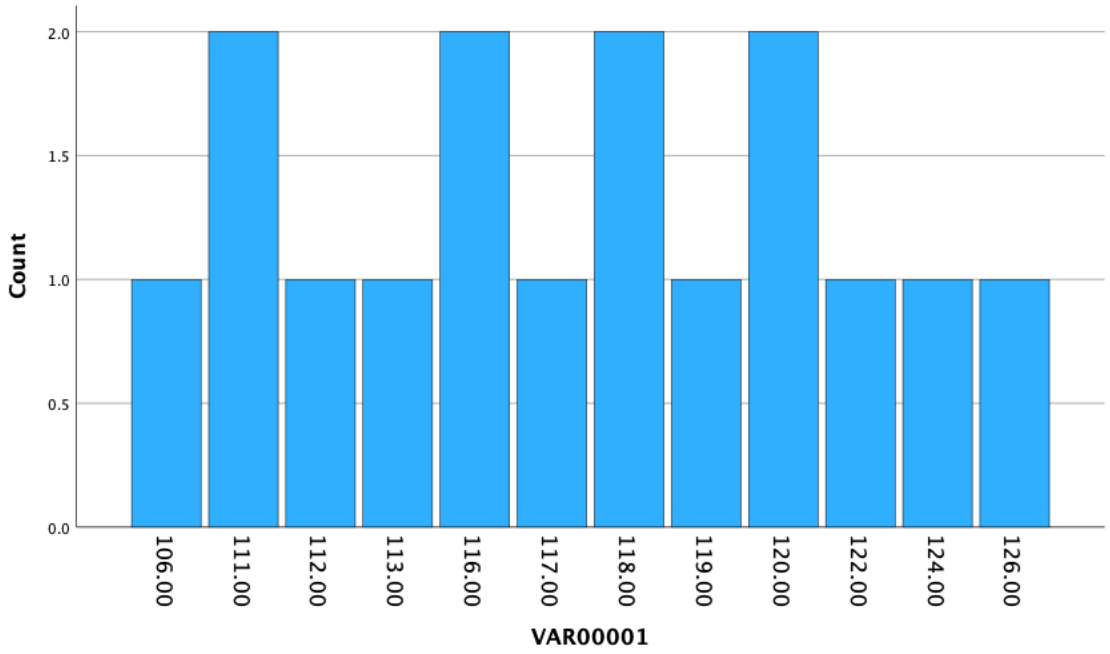
Descriptives

			Statistic	Std. Error
VAR00001	Mean		52.0000	.57735
	95% Confidence Interval for Mean	Lower Bound	50.7694	
		Upper Bound	53.2306	
	5% Trimmed Mean		52.1667	
	Median		52.5000	
	Variance		5.333	
	Std. Deviation		2.30940	
	Minimum		46.00	
	Maximum		55.00	
	Range		9.00	
	Interquartile Range		3.00	
	Skewness		-1.188	.564
	Kurtosis		1.699	1.091

Figure 3 shows the respondents' scores to the questions on the BKAC. The answer choices are dispensed with the Likert scale, ranging from strongly disagree, disagree, agree, and strongly agree.

Figure 3

Qualtrics Webinar Pre-Test Survey Responses: Breastfeeding Knowledge, Attitude, and Confidence Scale (BKACs)



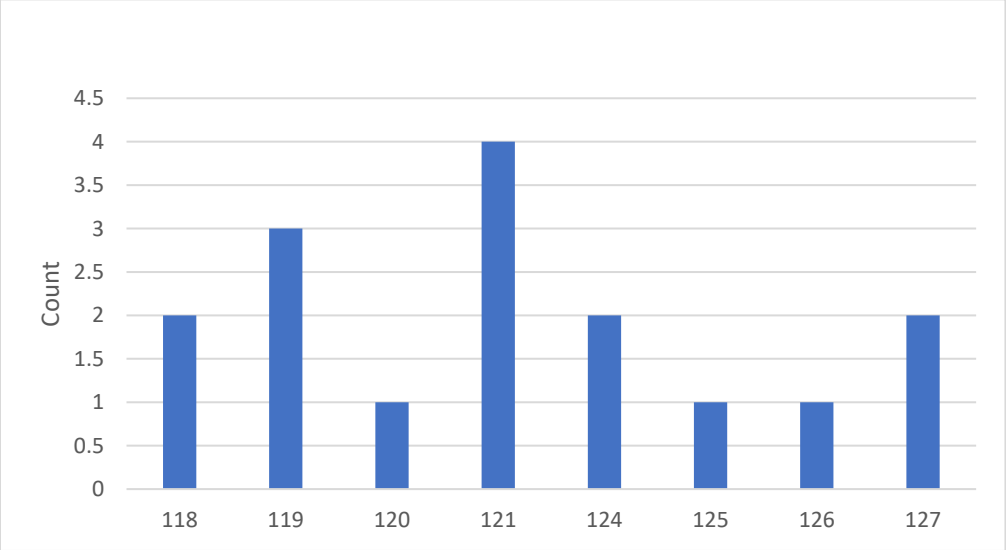
Descriptives

			Statistic	Std. Error
VAR00001	Mean		116.8125	1.31409
	95% Confidence Interval for Mean	Lower Bound	114.0116	
		Upper Bound	119.6134	
	5% Trimmed Mean		116.9028	
	Median		117.5000	
	Variance		27.629	
	Std. Deviation		5.25635	
	Minimum		106.00	
	Maximum		126.00	
	Range		20.00	
	Interquartile Range		7.75	
	Skewness		-.241	.564
	Kurtosis		-.126	1.091

Figure 4 shows the post-test results on the BKAC once again presented in the Likert scale ranging from strongly disagree, disagree, agree, and strongly agree.

Figure 4

Qualtrics Webinar Post-Test Survey Responses: Breastfeeding Knowledge, Attitude, and Confidence Scale (BKACs)



Descriptives

			Statistic	Std. Error
VAR00001	Mean		121.8750	.78991
	95% Confidence Interval for Mean	Lower Bound	120.1913	
		Upper Bound	123.5587	
	5% Trimmed Mean		121.8056	
	Median		121.0000	
	Variance		9.983	
	Std. Deviation		3.15964	
	Minimum		118.00	
	Maximum		127.00	
	Range		9.00	
	Interquartile Range		5.75	
	Skewness		.464	.564
	Kurtosis		-1.234	1.091

Figure 5 shows the results of the question, “Will you initiate a discussion on breastfeeding education with pregnant patients in the first trimester of pregnancy? Yes or No.”

The answer choice was a straightforward “Yes” or “No.” The 16 research participants selected “Yes” they would initiate a discussion on breastfeeding education with their patients.

Figure 5

Will You Initiate a Discussion on Breastfeeding Education With Pregnant Patients in the First Trimester of Pregnancy? Yes or No.

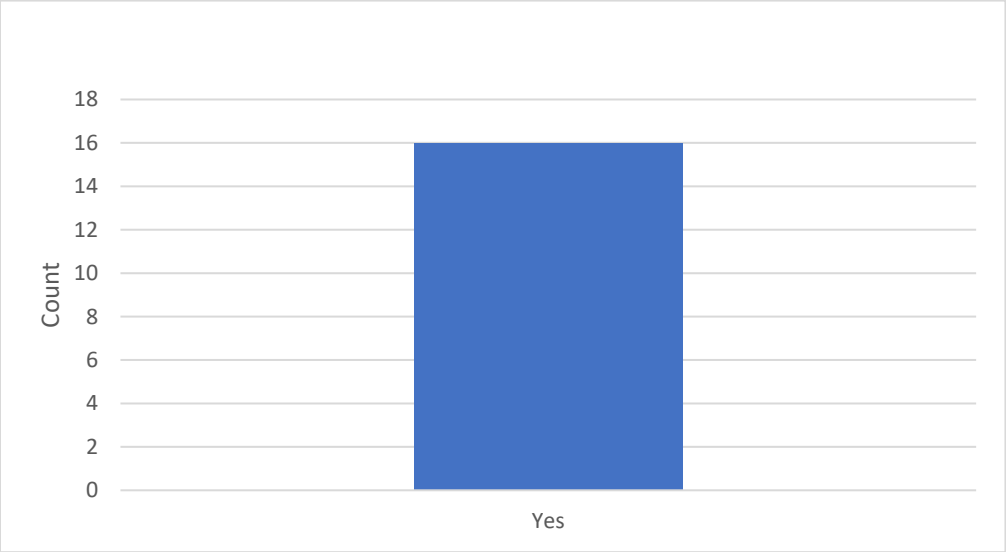
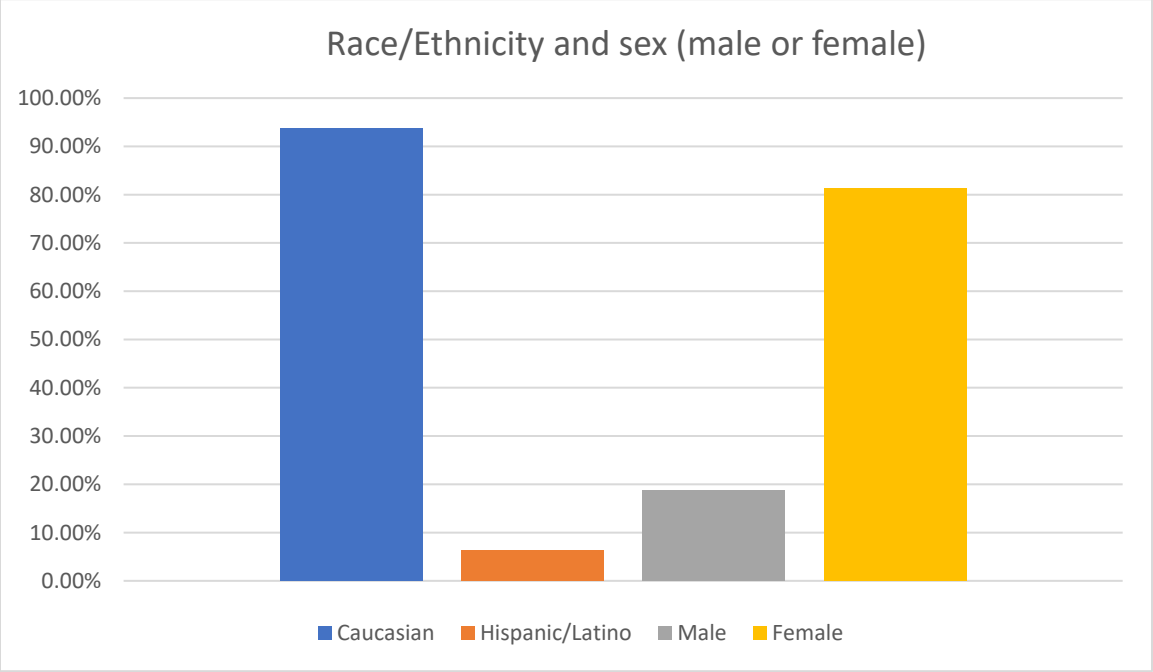
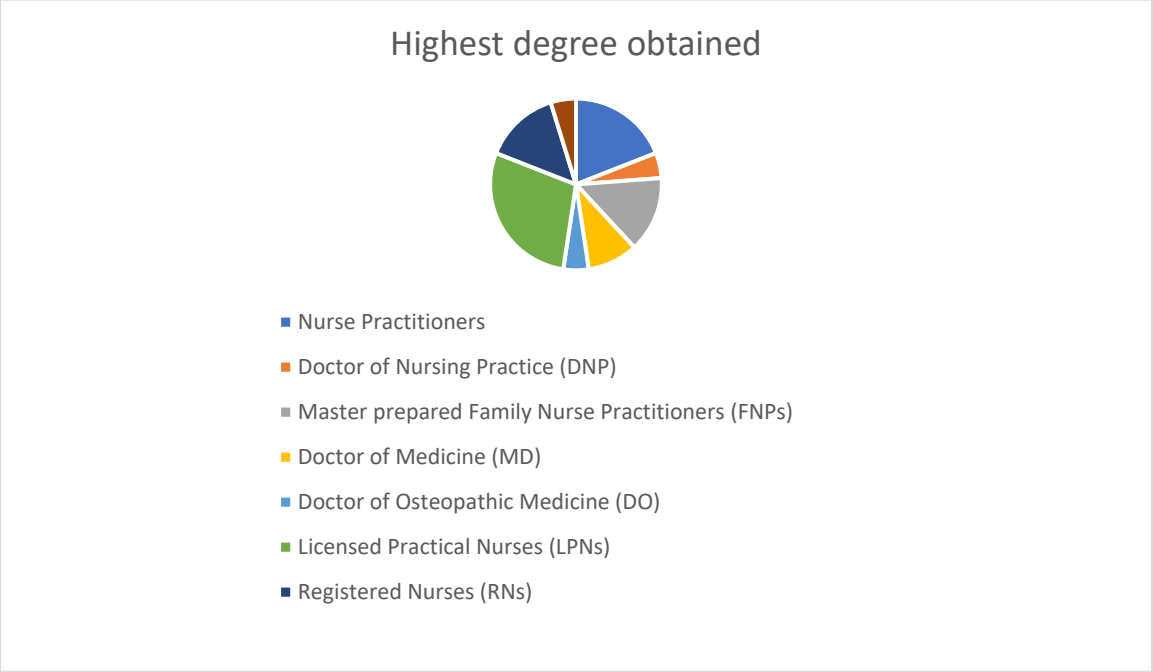
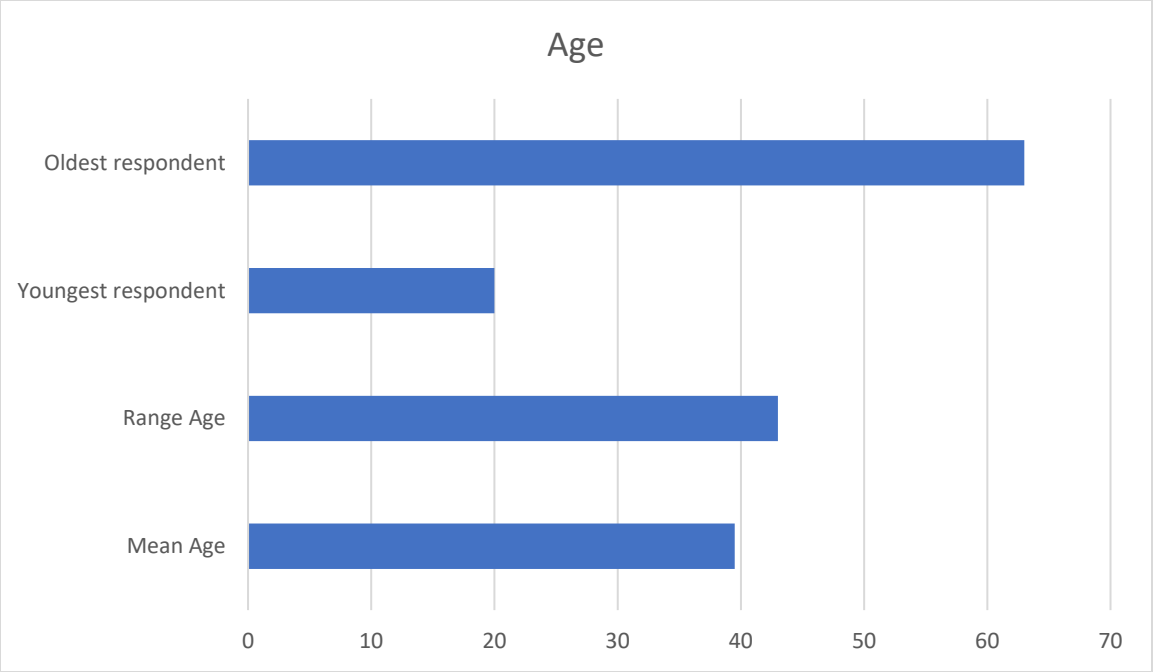


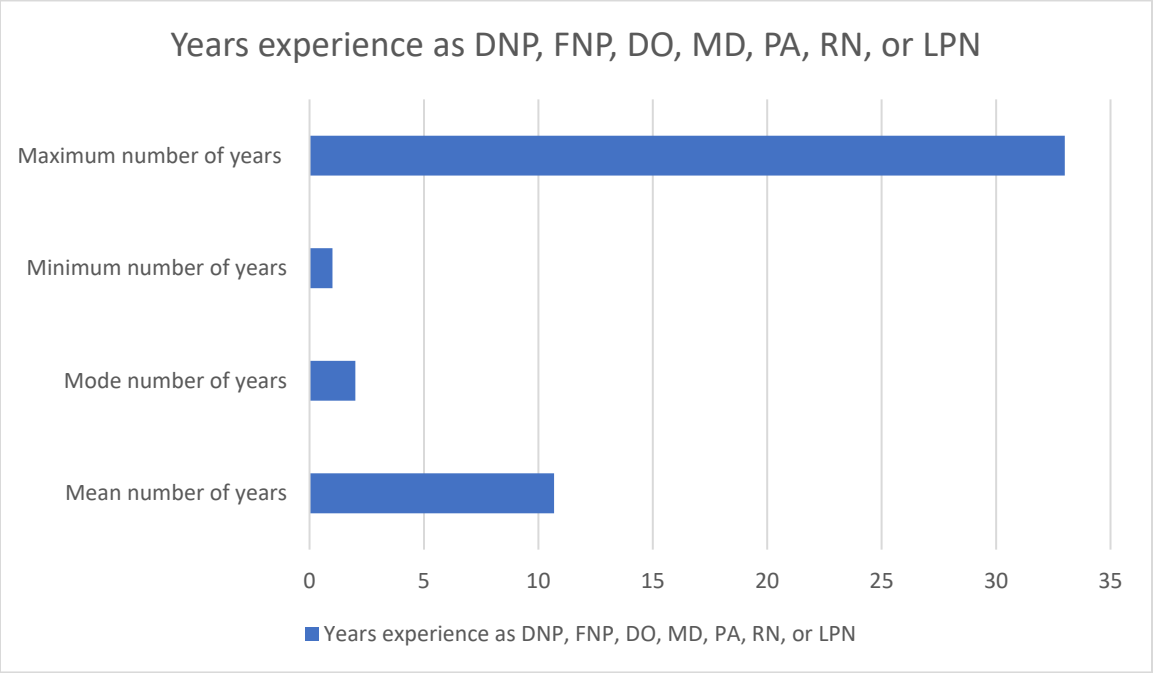
Figure 6

Demographics









Analyses of Research Questions/Hypothesis Testing

Paired t-tests evaluated the attitudes towards breastfeeding before the breastfeeding program webinar and after implementation. The p-value was set at 0.5 to determine statistical significance. The one-sided p resulted in 0.336, and the two-sided p resulted in 0.672. The paired

t-tests allowed for comparison of the means for both attitudes pre-test and post-test data sets. The mean of the pre-test survey responses for the IIFAS was 51.1875.

In contrast, the mean of the post-test survey responses for the IIFAS was 52. The standard deviation (SD) of the IIAFS pre-tests was 3.52550. On the contrary, the SD of the IIAFS post-test was 2.30940. The attitudes towards breastfeeding did not change enough to be considered statistically significant.

To compare the knowledge and confidence before and after the breastfeeding webinar implementation, paired t-tests were utilized. Once again, the p-value was set at 0.5 to determine statistical significance. These results demonstrated statistical significance with a one-sided p of 0.009 and a two-sided p of 0.018. The providers' and nurses' breastfeeding knowledge and confidence in providing breastfeeding education increased significantly.

Interestingly, when respondents were asked, "Will you initiate a discussion on breastfeeding education with pregnant patients in the first trimester of pregnancy?", 100% responded with "yes." A breastfeeding education webinar provided by an IBCLC does increase primary care providers' and nurses' knowledge and confidence to initiate breastfeeding education in their practice for their patients. However, PCPs and nurses did not improve from a neutral attitude to a positive attitude towards breastfeeding.

Results Summary

The quality improvement project evaluated whether integrating breastfeeding education and addressing common breastfeeding MythBusters increased PCPs' and nurses' knowledge, attitudes, and confidence levels in educating expectant mothers in small, rural clinics. The survey results showed no statistical significance in attitudes changing from neutral or positive towards formula feeding to positive towards breastfeeding. Based on the statistical analysis, breastfeeding

education provided by an IBCLC via an online Webinar has statistically increased the PCPs' and nurses' knowledge and confidence levels in educating expectant mothers in a rural area providing primary care. Overall, the research demonstrated a need for continued breastfeeding education to enhance the knowledge and confidence of primary care providers and nurses providing care for expectant mothers in the first trimester of pregnancy.

Discussion and Conclusion

Professional support positively influenced the patient's decision to breastfeed (Campbell et al., 2019; Coffman, 2019; Guise et al., 2003; Wambach & Riordan, 2016). Increased investments in breastfeeding support, both prenatally and postpartum for women and families, positively affected breastfeeding initiation and duration (Campbell et al., 2019; Wambach & Riordan, 2016). The exclusive breastfeeding rates both nationally and in Virginia are well below the Healthy People 2030 goals of 42.9% exclusively breastfeeding rates through 6 months of age (ODPHP, 2021). Implementation of the QI project at the four Tri-Area Community Health clinics for PCPs and nurses addressed breastfeeding benefits, common breastfeeding issues, and MythBusters in breastfeeding, which is a start towards reaching the Healthy People 2030 goals. Breastfeeding education had shown an increase in the initiation and duration of exclusive breastfeeding. However, there was a gap in the literature regarding breastfeeding education in the Appalachian region. The project helped close the gap in the literature with an IBCLC that delivered breastfeeding education and determined that the intervention would increase the initiation of breastfeeding education by PCPs and nurses for patients in rural areas.

Chapter 5: Discussion

After identifying that professional healthcare team support positively influenced the decision to breastfeed, it guided the proposed project (Campbell et al., 2019; Guise et al., 2003;

Hale & Hartmann, 2017; Wambach & Riordan, 2016). The PI targeted healthcare professionals, particularly PCPs and nurses in small, rural primary healthcare settings. The PCPs' and nurses' breastfeeding knowledge and confidence in providing breastfeeding education increased significantly, as demonstrated by the paired t-tests.

The Qualtrics survey of the PCPs and nurses demonstrated that all participants desire to increase the initiation of breastfeeding education to expectant mothers in the first trimester in small, rural clinics. Though there was no breastfeeding, all participants indicated they would initiate a discussion on breastfeeding education with their patients. The breastfeeding education provided by an IBCLC via an online Webinar survey results showed statistical significance in increasing the PCPs' and nurses' knowledge and confidence levels in educating expectant mothers in a rural area providing primary care. The survey of PCPs and nurses demonstrated no improvement from a neutral attitude to a positive attitude toward breastfeeding. The ACOG supports providing clear and consistent education on breastfeeding benefits prenatally to parents. Healthy People 2020 and ACOG encouraged PCPs to integrate the promotion of breastfeeding education into their practice (Radoff & Forman, 2019).

One top factor influencing breastfeeding initiation and continuation of breastfeeding for mothers included breastfeeding education (Cohen et al., 2018). The recommendation is that the PCPs and nurses in small, rural clinics consider how they can sustain the initiation of a discussion on breastfeeding education with their pregnant patients in the first trimester of pregnancy in primary care. A comparison of the PCPs' and nurses' knowledge and confidence levels before and after the breastfeeding webinar implementation demonstrated a significant increase in breastfeeding knowledge and confidence in providing breastfeeding education. The CEO of the Tri-Area Community Health clinics, Dr. James L.Werth, Jr., Ph.D., ABPP,

encouraged continued delivery of breastfeeding education provided by an IBCLC at their weekly clinic meetings.

Relationship of Findings to Prior Research

The initiation of breastfeeding education to patients in the first trimester of pregnancy profoundly impacted breastfeeding initiation and duration (Barimani et al., 2017; Wambach & Riordan, 2016). One identified barrier to breastfeeding initiation was the lack of professional information and support regarding breastfeeding for the patient (Barimani et al., 2017). Additional barriers included inconsistent breastfeeding education, lack of rapport with the healthcare professional, and no support for breastfeeding challenges for the patient from the healthcare provider (Barimani et al., 2017; Coffman, 2019).

When primary care practices in Appalachian clinics integrated MI into their practice, breastfeeding exclusivity rates, self-efficacy, and the mother's intention to breastfeed all increased (Addicks & McNeil, 2019). As evidenced by a thorough systematic review and meta-analysis, the most effective intervention for the initiation and duration of breastfeeding is breastfeeding education (Guise et al., 2003). When individuals receive breastfeeding support and education prenatally, initiation and continuation of exclusive breastfeeding increase (Cohen et al., 2018).

The Academy of Breastfeeding Medicine (ABM) posted Clinical Protocol #19. This protocol addressed the importance of integrating breastfeeding education in the first trimester regarding recommendations of exclusive breastfeeding for 6 months, breastfeeding benefits, and common benefits of breastfeeding (ABM, 2019; Rosen-Carole & Hartman, 2015). Interestingly, virtual breastfeeding support, such as with mobile phones, increased exclusive breastfeeding rates by 20% (Jerin et al., 2020; Schindler-Ruwish & Phillips, 2021).

Research suggests the importance of exclusive breastfeeding for both the mother and infant's short-term and long-term health benefits (Abuidhail et al., 2019; Addicks & McNeil, 2019; Bartick et al., 2017; Coffman, 2019; Farr et al., 2019; Huang et al., 2019; Jerin et al., 2020; Krol & Grossmann, 2018; Patterson et al., 2020; Sanchez et al., 2019; Tseng et al., 2020; Walters et al., 2019; Witt et al., 2019; Yang et al., 2018). The DNP project demonstrated collinearity between receiving the breastfeeding education provided by an IBCLC via an online Webinar and the statistically significant increase in the PCPs' and nurses' knowledge and confidence levels in educating expectant mothers in a rural area providing primary care.

The results of the Qualtrics webinar survey responses on the Iowa Infant Feeding Attitude Scale (IIFAS) were compelling. The responses on the IIFAS indicated most respondents had neutral attitudes toward breastfeeding. In the pre-test survey, four respondents scores indicated positive attitudes towards formula feeding. In the post-test survey, two respondents scores indicated positive attitudes towards formula feeding. The mean scores on the pre-test and post-test surveys on the IIFAS were neutral attitudes toward breastfeeding, which could be correlated to the respondents not wanting to express a definitive opinion.

Observations

Dr. Werth's buy-in to the project was vital. He ensured the surveys were disseminated to the eligible PCPs and nurses in the small, rural primary care clinics. An adequate sample of 16 providers and nurses was obtained through convenience sampling. Based on the estimated effect size, the target sample was 16 PCPs and nurses.

Reassuring findings were the statistically significant increase in PCPs' and nurses' breastfeeding knowledge confidence levels in providing breastfeeding education. Noteworthy findings were the respondents' 100% response to "yes" on the question included in the posttest

Qualtrics survey, “Will you initiate a discussion on breastfeeding education with pregnant patients in the first trimester of pregnancy?” After implementing the breastfeeding educational webinar led by an IBCLC, it was fascinating to learn the pivotal role IBCLC support in the rural primary care setting had on PCPs’ and nurses’ breastfeeding knowledge and confidence levels. The intriguing finding was the IIFAS results of the PCPs’ and nurses’ attitudes towards breastfeeding and formula-feeding. Neutral responses towards breastfeeding could mean the participants did not want their opinions specifically expressed.

Evaluation of the Theoretical Model

Dr. Afaf Meleis’ transitions theory guided the project as it focuses on supporting the transition of PCPs and nurses providing breastfeeding benefits to patients in the first trimester of pregnancy. The transitions theory provided breastfeeding education for PCPs and nurses in rural clinics, empowering them with breastfeeding knowledge and demonstrating the direct relationship to the transitions. The PCPs and nurses demonstrated how they can use the middle-range theory by indicating their desire to support and provide breastfeeding education in patients’ first trimester through 100% of respondents answering “yes” to the question, “Will you initiate a discussion on breastfeeding education with pregnant patients in the first trimester of pregnancy?”

Limitations

Limitations of the project included that 16 out of 53 eligible providers and nurses participated in the project. Another limitation identified was the time-frame available for project implementation. Since convenience sampling was utilized, it may have decreased the generalizability of the project results. The IIFAS was validated and found reliable in over 27 published research studies, which included samples from healthcare providers. The BKACs was found reliable using a sample of healthcare professional students. Social desirability could be

responsible for the neutral attitude towards breastfeeding results from respondents.

A project limitation included the limited timeframe of 6 weeks for implementation. In addition, the key stakeholders had to buy into the project as well. As a result, RNs, LPNs, FNPs, MDs, and PAs had to choose to invest in the initiation of breastfeeding education for their patients. A limitation of the project was the small sample size. Another limitation of the study was the busy provider and nurse schedules, which led to limited attendance. Future recommendations would include a larger, more diverse population.

Implications for Future Research

The project provided a basis for future research involving breastfeeding education. As demonstrated by the project and supplemental research, professional support for patients plays a positive role in breastfeeding initiation (Campbell et al., 2019; Guise et al., 2003; Wambach & Riordan, 2016). Implementation of the project could be done in the future with a larger and more diverse sample size of PCPs and nurses. Continuation of the project could include an evaluation of on-site lactation support services led by an IBCLC. Future research could build on gathering baseline breastfeeding knowledge before educational interventions on breastfeeding and evaluation of intervention effectiveness. Future studies should increase the diversity and size of the sample's population.

Implications for Practice/Health Policy/Education

Investing in the initiation of breastfeeding education for patients remains imperative. The literature review demonstrates that a healthcare provider/nurse's support has a positive influence on a patient's decision to breastfeed. The research showed that breastfeeding education has increased the initiation and duration of exclusive breastfeeding (Abuidhail et al., 2019; Addicks & McNeil, 2019; Bartick et al., 2017; Coffman, 2019; Farr et al., 2019; Huang et al., 2019; Jerin

et al., 2020; Krol & Grossmann, 2018; Patterson et al., 2020; Sanchez et al., 2019; Tseng et al., 2020; Walters et al., 2019; Witt et al., 2019; Yang et al., 2018). An implication for nursing education is the integration of breastfeeding education into healthcare professional students' academic programs. Advanced practice nurses' roles can include leading health policy changes, such as breastfeeding education and support policies. Implications for future practice is the integration of a breastfeeding education webinar delivered by an IBCLC to PCPs and nurses in small, rural clinics significantly increased their breastfeeding knowledge and confidence.

Conclusion

The health benefits of breastfeeding improve patients' health outcomes for years to come. This project identified that breastfeeding education led by an IBCLC increased PCPs' and nurses' knowledge and confidence in delivering breastfeeding education. The project identified that PCPs and nurses strongly desire to integrate the initiation of breastfeeding education concerning the benefits of breastfeeding to their patients in the first trimester of pregnancy. These results demonstrated the need for continued integration of breastfeeding education into small, rural clinics. Therefore, further research needs to focus on increasing the initiation of breastfeeding education by PCPs and nurses for patients in rural areas by improving their knowledge and confidence in breastfeeding education.

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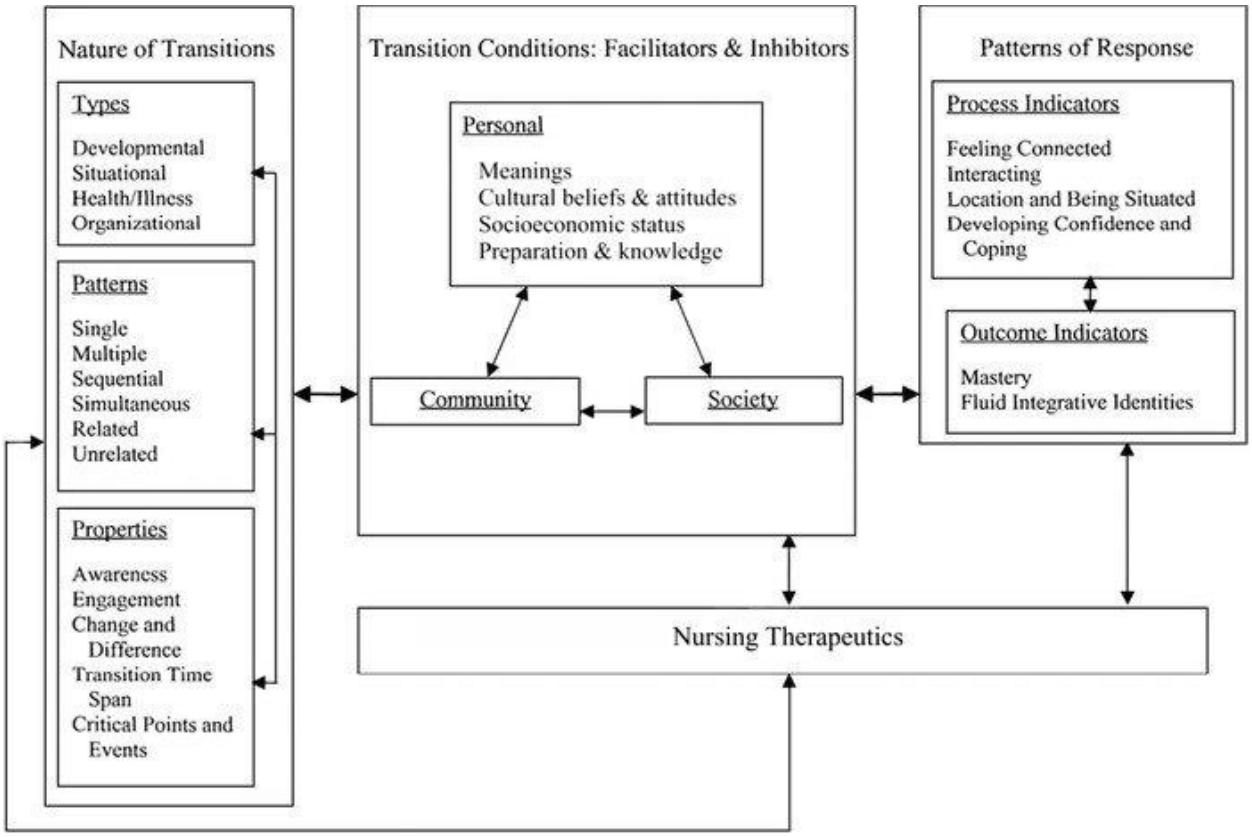
Appendix A

Transitions Theory by Dr. Afaf Meleis



(Meleis, 2010)

Appendix B

Iowa Infant Feeding Attitude Scale

	SD	D	N	A	SA
*1. The nutritional benefits of breast milk last only until the baby is weaned from breast milk.	1	2	3	4	5
*2. Formula-feeding is more convenient than breast-feeding.	1	2	3	4	5
3. Breast-feeding increases mother–infant bonding.	1	2	3	4	5
*4. Breast milk is lacking in iron.	1	2	3	4	5
5. Formula-fed babies are more likely to be overfed than are breast-fed babies.	1	2	3	4	5
*6. Formula-feeding is the better choice if a mother plans to work outside the home	1	2	3	4	5
7. Mothers who formula-feed miss one of the great joys of motherhood.	1	2	3	4	5
*8. Women should not breast-feed in public places such as restaurants.	1	2	3	4	5
9. Babies fed breast milk are healthier than babies who are fed formula.	1	2	3	4	5
*10. Breast-fed babies are more likely to be overfed than formula-fed babies.	1	2	3	4	5
*11. Fathers feel left out if a mother breast-feeds.	1	2	3	4	5
12. Breast milk is the ideal food for babies.	1	2	3	4	5
13. Breast milk is more easily digested than formula.	1	2	3	4	5
*14. Formula is as healthy for an infant as breast milk.	1	2	3	4	5
15. Breast-feeding is more convenient than formula feeding.	1	2	3	4	5
16. Breast milk is less expensive than formula.	1	2	3	4	5
*17. A mother who occasionally drinks alcohol should not breast-feed her baby	1	2	3	4	5

Note. Items marked with asterisks are reverse-scored and the scores for each item are then summed. Higher scores indicate more positive attitudes toward breast feeding.

(Casel et al., 2016)

(Mora et al., 1999)

The IIFAS can be reproduced in future research projects.

Appendix C

Demographic Questionnaire

ID Number (use last digit of phone number, number for month of birth, number for second digit of date of birth, and last digit of year of birth): _____

Age: _____

Gender: _____

Race/Ethnicity: _____

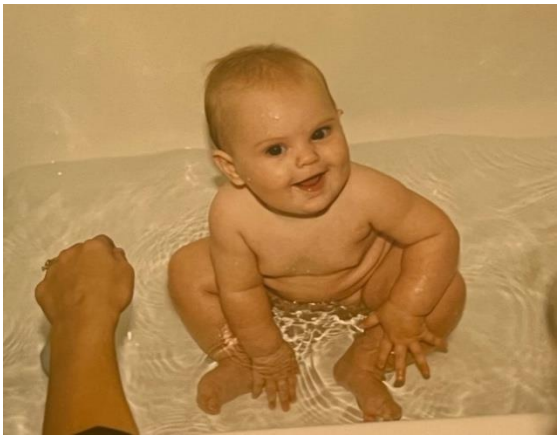
Number of years practicing as a DNP, FNP, DO, MD, PA, RN, and/or LPN? _____

Number of years working as a Primary Care Provider (PCP) or nurse in primary care?_____

Highest degree obtained: _____

Appendix D

Breastfeeding Brochure



BENEFITS OF BREASTFEEDING

Mother Benefits	Baby Benefits
Decreased risk of: • Type 2 Diabetes • Breast cancer • Ovarian cancer • Heart disease • Obesity • Postpartum depression • High blood pressure (hypertension) • Heart attack (myocardial infarction) • Osteoporosis (weak bones) • Rheumatoid Arthritis	**Decreased** risk of: • Respiratory infections • Ear infections • Sudden infant death syndrome (SIDS) • Asthma • Type 1 diabetes mellitus • Type 2 diabetes mellitus • Diarrhea • Colic • Childhood cancers, such as leukemia • Lower IQs • Obesity • Diarrhea • Allergies

Bartick, M. C., Schwarz, E. B., Green, B. D., Jegier, B. J., Reinhold, A. G., Colaizy, T. T., Bogen, D. L., Schaefer, A. J., & Stuebe, A. M. (2017). Suboptimal breastfeeding in the United States: Maternal and pediatric health outcomes and costs. *Maternal & Child Nutrition*, *13*(1). https://doi.org/10.1111/mcn.12366
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Appendix E

Literature Review Table

Article	1. Key words 2. Database Searched 3. Number articles found(total)	Author, Year, Title Source	1. Purpose 2. Research question (if used) 3. Independent and Dependent variable	1. Name of Theoretical/Conceptual Framework 2. List major assumptions	1. Method/ (QL or QN) 2. Design 3. Sample	1. Name of the Survey/ Questionnaire 2. Number of questions 3. Level of Measurement/ scale	1. Type of Statistics (descriptive+ inferential 2. Validity/ reliability (if none- NA) 3. Level of Evidence	1.Results (add numbers i.e. p-value, mean, t-test) 2.Conclusions (bullet the key findings)	1. Limitations 2. Recommendations for further study 3. Value of the Information
1.	1. telemedicine, breastfeeding 2. PubMed 3. 94	Kapinos, K., Kotzias, V., Bogen, D., Ray, K., Demirei, J., Rigas, M.A., & Uscher-Pines, L. (2019). The Use of and Experiences With Telelactation Among Rural Breastfeeding Mothers: Secondary Analysis of a Randomized Controlled Trial. *Journal of Medical Internet Research, 21*(19). https://doi.org/10.2196/13967	1. The purpose of this study was to analyze telelactation in rural breastfeeding women 2. Does providing telelactation improve breastfeeding continuation after discharge from a rural hospital in Pennsylvania 3. Independent Variable = telelactation services, rural hospital in Pennsylvania Dependent Variable = Breastfeeding challenges, telelactation satisfaction rates	None	1.QN 2.Randomized Control Trial (RCT); descriptive design 3. Randomized, n = 102 total women/participants in rural hospital in Pennsylvania	1. Study used women's survey data and the EMR telelactation call data 2. Surveys were initiated at hospital and 2, 4, and 12 weeks postpartum. Unsure of number of questions. 3. Ordinal data for satisfaction of telelaction app. Nominal data through yes and no questions on surveys.	1. Descriptive = %, mean, table of data Inferential = Chi-square tests, t tests, and p interval 2. Reliability – Further research needs to be conducted on telelactation. Researchers referred to their study as a "pilot." Other studies have validated the necessity of breastfeeding support in correlation to increasing breastfeeding rates. 3. Level II on the evidence hierarchy	1. Participants working 12 weeks postpartum and utilizing telelactation vs. no telelactation (68%, p = 0.02; none = 41%). Prior breastfeeding experience (39%, p = 0.02). Exclusive breastfeeding at hospital discharge (52%, p<.001). t = 0.98. 2. Providing telelactation is encouraged for rural breastfeeding women. Challenges identified during the research study included participants not participating	1. Limitations are the small sample of only 102 women. 2. Gather a more diverse sample and implement telelactation in urban areas as well as rural. More research needs to be done to evaluate the impact of providing telelactation to breastfeeding women. 3. Telelactation can encourage non-breastfeeding mothers to breastfeed.

								due to ceasing breastfeeding during the study and not having enough time to complete surveys. According to the data collected 91% of users were satisfied with the telelactation services.	
2.	1. breastfeeding and telemedicine 2. CINAHL 3. 58	Uscher-Pines, L., Ghosh-Dastidar, B., Bogen, D. L., Ray, K. N., Demirci, J. R., Mehrotra, A., & Kapinos, K. A. (2020). Feasibility and Effectiveness of Telelactation Among Rural Breastfeedin g Women. *Academic Pediatrics, 20*(5), 652-659.	1. The purpose of the study was to see if telelactation increased rural breastfeeding in women. 2. Does utilizing electronic devices for telelactation improve breastfeeding in a rural area 3. Independent variables = Telelactation and electronic app. Dependent variables = Breastfeeding rates and data from surveys	None	1. QN 2. Randomized Control Trial 3. Randomized, n = 102 received telelactation and n = 101 received regular care. The women 18 and older in a rural area for a total of 203 individuals.	1. Demographic survey, breastfeeding practices and plans surveys, work status (at start and 12 weeks), breastfeeding challenges survey (at 2 and 12 weeks). 2. Total number of surveys in study = 4. Unsure of number of questions. 3. Interval for surveys. Survey questions obtained from the National Immunization Survey, Infant Feeding Practices Survey, and developed from the	1. Descriptive = % of breastfeeding at 12 weeks table Inferential = p values, t tests, and chi-square 2. Reliability – Research has been done on IBCLCs and validated through other studies. 3. Level II on the evidence hierarchy	1. Breastfeeding percentage prior to telelactation 71% to 86%; p = 0.01. Breastfeeding exclusively: 51% of telelactation vs. 46% control (p = 0.47). Breastfeeding at 12 weeks: 56% of telelactation breastfeeding exclusively vs. 45% control (p = 0.48). ITT 73% of telelactation vs.	1. The limitations in the study were the individuals participated in the study from a single, rural site with mostly Caucasians. 2. A larger group of individuals needs to be enrolled in study. Only non-Hispanic individuals were enrolled in the study. Diversity needs to be increased in a future study. With

		https://doi.org/10.1016/j.acap.2019.10.008				team. Ordinal for breastfeeding duration.		78% control were pleased with their breastfeeding experience (p = 0.41). 2. Telelactation can help rural areas, but more studies with telelactation need to be implemented.	telelactation researchers need to study all kinds of delivery- especially text messages. 3. Telelactation can be a way to meet the "Surgeon General's Call to Action to Support Breastfeeding" by providing IBCLC consults virtually for rural populations.
3.	1. support, breastfeeding, telemedicine, pandemic 2. PubMed 3. 346	Schindler-Ruwisch, J., & Phillips, K. E. (2021). Breastfeeding During a Pandemic: The Influence of COVID-19 on Lactation Services in the Northeastern United States. *Journal of human lactation: official*	1. The purpose of this study was to find out what factors in lactation support need changing because of the COVID-19 pandemic. 2. What do lactation providers deems need to be changed for breastfeeding services after the COVID-19 pandemic? 3. Independent variables = telelactation, breastfeeding	None	1.QN 2.Prospective, cross-sectional survey design 3.Convenient sample = WIC recipients. n = 39	1. Qualtrics platform designed by the researchers themselves. 2. 33 questions 3. Surveys for lactation credentialled staff. SPSS (Version 25) for Qualtrics platform surveys. Ordinal data through Likert scale for surveys.	1. Descriptive = table of areas needing improvement for lactation help Inferential = chi-squared analysis, p value 2. A larger population is needed for validity. 3. Level IV on the evidence hierarchy	1. Pre COVID-19 lactation consults vs. during COVID-19 lactation consults (p <.001). 69.2% of participants used telehealth, whereas 15.4% opted for in-person appointments. Telelaction support was found by 58.1% of participants to be helpful.	1. Limitations of this study are the results cannot be generalized to all breastfeeding individuals. 2. Further data needs to be collected on the impact of the COVID-19 pandemic on lactation support and breastfeeding rates at discharge, 6

		journal of International Lactation Consultant Association, 37(2), 260-268. https://doi.org/10.1177/0890334421100 3898	support Dependent variables = breastfeeding initiation, duration, and exclusivity					23.3% reported to have technical difficulties for telelactation. 2. Adaptation is necessary when providing lactation support services to women, such as telelactation during a pandemic.	months, and one year. 3. Breastfeeding support is imperative for breastfeeding duration and telelactation delivery needs to become the norm.
4.	1. exclusive breastfeeding and how to improve 2. Google Scholar 3. 1,030	Jerin, I., Akter, M., Talukder, K., Talukder, M. Q., & Rahman, M. A. (2020). Mobile phone support to sustain exclusive breastfeeding in the community after hospital delivery and counseling: a quasi-experimental study. *International Breastfeeding Journal*, *15*(1	1. The purpose of this study was to find out if breastfeeding support after hospital delivery via telephone follow up increases exclusive breastfeeding rates in the community. 2. Does breastfeeding support after hospital discharge through mobile phones improve exclusive breastfeeding rates? 3. Independent variables = Centre for Women and Child Health	Theoretical framework = Rates of exclusive breastfeeding (EBF) can be high when there is hospital support, education, promotion. However, when community support is lacking, exclusive breastfeeding (EBF) drops dramatically.	1.QN 2. Quasi-experimental study 3. sample of 129 mothers	1.No survey 2. NA 3. Trained healthcare professionals providing in hospital breastfeeding support and education. Phone call for every 15 days after discharge and up to 6 months of age for lactation support.	1. Descriptive = table with pre-intervention and post-intervention data; mean Inferential = p value, chi-square test, t-test 2. Research has been conducted to confirm the benefits of breastfeeding. Further research needs to be done on telelactation. 3. Level III on the evidence hierarchy	1. prior to intervention exclusive breastfeeding rates (p = 0.59). Exclusive breastfeeding rates with lactation support through mobile devices (p = 0.000). 98% of mothers went to school, 87% of mothers were housewives, 76% of women were 37 weeks or greater, 81% were a cesarean	1. The limitations of this study are that the mothers and infants were not randomly selected. Another limitation identified by the researchers was the package of interventions to promote exclusive breastfeeding in the hospital, such as first feeding within one hour of delivery and multiple consults within

		). https://doi.org/10.1186/s13006-020-00258-z	(CWCH) breastfeeding promotion. Providing mobile telephone breastfeeding telelactation consults and assistance. Dependent variables = exclusive breastfeeding rates					section, 54% were primipara, 58% breastfeeding pre-intervention, 78% breastfeeding in intervention phase. 2. Lactation support through mobile devices helps with exclusive breastfeeding rates (EBR).	the 48 hours after delivery. Also, the mothers may have felt "pressured" to answer with good feedback since they were receiving recurrent telephone calls once they were discharged home from the hospital. 2. The first recommendation would be to increase the sample size and make the sample more diverse. 3. When there is lactation support using telephones, exclusive breastfeeding rates increase.
55.	1. Prenatal breastfeeding education using transitions theory 2. Google Scholar 3. 17,000	Tseng, J.-F., Chen, S.-R., Au, H.-K., Chipojola, R., Lee, G.T., Lee, P.-H, Shyu, M.-L., & Kuo, S.-Y. (2020).	1. The purpose of this study was to improve first-time mothers' self-efficacy to maintain breastfeeding longer.	1. self-efficacy theory	1. QN 2. Randomized Control Trial (RCT), single-blind 3. Randomized convenience	1. Edinburgh Postnatal Depression Scale (T-EPDS). State-Trait Anxiety Inventory (T-STAI). Breastfeeding Self-Efficacy Scale-Short form (BSES-SF). Iowa Infant Feeding	1. Descriptive – studying outcomes with a prenatal breastfeeding education program; % of breastfeeding rates. Inferential – p value, t-tests, chi-square, Analysis of	1. Women who received breastfeeding education program to improve breastfeeding self-efficacy had higher	1. This study was great. However, the researchers identified a limitation to be the small sample size of only first-time

		Effectiveness of an integrated breastfeeding education program to improve self-efficacy and exclusive breastfeeding rate: A single-blind, randomized controlled study. *International Journal of Nursing Studies, 111,* 103770. https://doi.org/10.1016/j.ijnurstu.2020.103770	2. Do prenatal breastfeeding educational programs prolong and increase breastfeeding rates in new mothers? 3. IV-breastfeeding education program. DV-breastfeeding self-efficacy, infant feeding attitude scores, exclusive breastfeeding rates postpartum.		sample, n=104 total women selected with a gestational age of 12-32 weeks, primigravida with singleton pregnancies	Attitude Scale (IIFAS). Self-report questionnaire for breastfeeding rates. Satisfaction questionnaire with the breastfeeding education program created by the researchers. All adapted to Taiwanese versions. 2. 10-item self-reported questionnaire with 4-point scale with T-EPDS. 20-iteam T-STAI with 4-point Likert scale. 14-item self-report instrument for breastfeeding self-efficacy using 5-point Likert scale. 17-item IIFAS on 5-point Likert scale. Self-report questionnaire for breastfeeding rate. Researched created 14-item questionnaire for satisfaction of the breastfeeding educational program. 3. ordinal for breastfeeding satisfaction, self-	covariate (ANCOVA) test, fisher's exact test 2. Reliability found to be 0.95 for Breastfeeding Self-Efficacy Scale Short form using Cronbach's alpha. T-STAI was a Cronbach alpha of 0.91. Researchers stated the validity of the Iowa Infant Feeding Attitude Scale (IIFAS) has been confirmed in several studies and in multiple countries. 3. Level 1 of the evidence hierarchy	rates for exclusive breastfeeding. Self-efficacy = 36 weeks' gestation ($p < 0.001$), 1 week postpartum ($p < .001$), 1 month ($p < .001$), 3 months ($p < .01$). infant feeding attitudes ($p < .05$). Exclusive breastfeeding rates = 1 week ($p < .02$) (98% with intervention & 86% with control group), 1 month (100% for breastfeeding group & 90.7%), 3 months (94% in intervention group & 76.7% without prenatal breastfeeding education). Exclusive breastfeeding = 3 months (odds ratio = 4.7 with a 95% confidence	pregnant women in the Jordan area. 2. The recommendation is to conduct additional research with a goal of replicating the study in another area with a more diverse group of people. 3. Prenatal breastfeeding education program was shown to increase breastfeeding self-efficacy and exclusive breastfeeding rates in primigravida mothers with singleton pregnancies.

						efficacy, rate; use of Likert scales.		interval (CI) and a p = .05 and 6 months (odds ratio = 2.82, CI = 95%, and p = .05).	
66.	1. Prenatal breastfeeding education 2. PubMed 3. 1,464	Yeh, C.-H., Yang, Y.-P. N., & Lee, B-O. (2020). The effects of a hospital-based perinatal breastfeeding program on exclusive breastfeeding in Taiwan: a quasi-experimental study. *Australian Journal of Advanced Nursing, 37*(3). https://doi.org/10.37464/2020.373.81	1. The purpose of this study was to assess a perinatal breastfeeding program (PBP) and its effect on the exclusive breastfeeding rates at discharge and one-month after hospital discharge. 2.Does a perinatal breastfeeding program improve the exclusive breastfeeding rates? 3. IV- perinatal breastfeeding program. DV- exclusive breastfeeding rates.	None	1. QN 2.Quasi-experimental study 3. Total of 60 mothers and their infants using a quasi-experimental design. N = 60.	1. Maternal prenatal demographic questionnaire (MPDQ). Birth Kangaroo Mother Care (BKMC) log. Index of Breastfeeding Status (IBS). 2. Six questions on MPDQ = mother's age, educational level, occupation, leave of absence from job, breastfeeding classes attended, and father support with breastfeeding. Four questions for BKMC log = amount of time for skin-to-skin care, how long kangaroo mother care was implemented, time of first feed, and amount of time for the first breastfeeding. Index of Breastfeeding Status (IBS) examined self-	1. Descriptive – mean, SD, %. Inferential – t test, Chi-square test, Fisher's exact test 2. The researchers confirmed the validity of the interventions in improving breastfeeding rates, such as skin-to-skin until first feeding, 24-hour rooming in. However, they were unable to verify the reliability of the instruments they utilized due to the collection of data such as the "reason for formula feeding." 3. Level II of the evidence hierarchy	1. Hospital discharge exclusive breastfeeding rates = 93.3% (mothers who received perinatal breastfeeding program) and 53.3% (mothers who were in control group). When first breastfeeding was initiated ($t = 3.34$, $p < .01$; $x2 = 40.05$, $p < .001$). One-month postpartum exclusive breastfeeding ($x2 = 13.32$, $p < .01$ at T1; $x2 = 15.95$, $p < .001$ at T2). 2. Exclusive breastfeeding rates were higher in the women who	1. Limitations defined by the researchers were the small sample size and mother-in-law interference with kangaroo mother care (KMC). 2. Further studies need to be conducted with implementation of perinatal breastfeeding programs. There needs to be a larger, more diverse sample size. In addition, researchers should evaluate the mother's satisfaction of the breastfeeding experience. 3. Use of a perinatal breastfeeding

						reports of the patterns and incidence of breastfeeding. 3. Nominal for mother's age, level of education. Ordinal for surveys. Interval for research participants gestational age between 37-42 weeks gestation at birth.		participated in the perinatal breastfeeding program.	program can dramatically increase exclusively breastfeeding rates.
77.	1. Effect of prenatal breastfeeding education 2. CINHAL 3. 175	Bookhart, L. H., Joyner, A. B., Lee, K., Worrell, N., Jamieson, D. J., & Young, M. F. (2021). Moving Beyond Breastfeeding Initiation: A Qualitative Study Unpacking Factors That Influence Infant Feeding at Hospital Discharge Among Urban, Socioeconomically Disadvantaged Women.	1. The purpose of this study was to find factors that interfere with exclusive breastfeeding at hospital discharge. 2. "What factors influence in-hospital exclusive breastfeeding?" (Bookhart et al., 2021). 3. IV – Facility breastfeeding promotion. Semi-structured 40-minute interviews with mothers. DV – factors influencing breastfeeding rates during hospital stay.	Social-ecological model (SEM)	1. QL 2. cross-sectional, qualitative design 3. Purposive sample using Social-ecological Model sampling to choose individuals. N = 38 (10 exclusive breastfeeding, 10 not exclusively breastfeeding, and 18 other individuals, such as nurses, community members, etc.).	1. Semi-structured interview guide topics. 2. 58 questions. 3. Nominal yes or no for women participation in WIC program. Nominal for woman's age, race, parity, ethnicity, education, marital status, employment status	1. Descriptive – %, mean Inferential – none identified 2. The researchers validated their data through MAXQDA 2018 software and double coding by hand to confirm code validity. Reliability- similar studies have been conducted. 3. Level III of the evidence hierarchy	1. Both barriers and facilitators were identified by women and key stakeholders in the study. Barriers were found to be a perception of inadequate milk supply, inadequate hospital staffing, conflicting breastfeeding information from staff, lack of prenatal breastfeeding education, and lack of time for breastfeeding education during	1. A limitation was the exclusion of non-English speaking women in the research study. 2. This study was conducted in an urban area. Further research needs to be done on rural areas using Behavior Change Wheel framework. 3. Prenatal breastfeeding education is a factor that has a positive influence on the exclusive breastfeeding rates during

		Journal of the Academy of Nutrition and Dietetics. https://doi.org/10.1016/j.jand.2021.02.005						hospitalization. Facilitators were identified as breastfeeding encouragement at prenatal healthcare visits, family support, prenatal breastfeeding education, and practical help from hospital staff with breastfeeding. 2. Through utilization of the social ecological model (SEM) factors can be changed to promote exclusive breastfeeding during hospitalization.	hospital stay. The way hospital staff delivers breastfeeding education to women and their families can be either a barrier or a facilitator. For example, it is necessary to provide consistent, accurate breastfeeding information by all hospital staff.
88.	1. Effect of prenatal breastfeeding education 2. CINHAL 3. 175	Barimani, M., Vikstrom, A., Rosander, M., Forslund Frykedal, K., & Berlin, A. (2017). Facilitating and inhibiting	1. The purpose of this study was to identify facilitating and inhibiting factors of parenthood transition. The study also served to identify interventions healthcare	1.Meleis transition theory	1.QL 2. Secondary analysis using Meleis transition theory 3. 60 parents	1. Semi-structured interviews 2. 22 hours and 45 minutes worth of recorded interviews. Study I had 21 semi-structed interviews. Study II had 7 focus-group interviews.	1. Descriptive - % and mean (mean age of research participants was 31) (63% women & 37% men) 2. Data was validated through MAXQDA11 software and all the researchers	1. A sample of 60 parents were obtained which included 38 women, 22 men, 49 first-time parents (82%), and 11 parents with two or more children (18%).	1. A limitation to this study is the very small sample size. Another limitation is the fact researchers chose to exclude participants

		factors in transition to parenthood – ways in which health professionals can support parents. *Scandinavian Journal of Caring Sciences, 31*(3), 537-546. https://doi.org/10.1111/scs.12367	professionals can utilize to make the transition to parenthood as smooth as possible. 2. Can Meleis transition theory help with development of interventions to help parents with their transition to parenthood? 3. IV- semi-structured interviews DV- Facilitating factors for parenthood transition (e.g., preparing with parent education, social support, healthcare professional support). Inhibiting factors for parenthood transition (e.g., stress, lack of sleep, inadequate healthcare professional support, unrealistic expectations)			3. Nominal with male or female parents	participating in the study validated their data as well. Bookhart (2021) used MAXQDA software in their research study. 3. Level III of the evidence hierarchy	2. Using the transition theory, parents' self-confidence was increased with developed coping strategies for said transition. Healthcare professionals can improve transitions in life through education practices and directing individuals to resources.	socioeconomic status. 2. Researchers recommended conducting a longitudinal design to further understand human transitions in life using the transition theory. 3. Meleis's transition theory is used internationally and will assist healthcare professionals in providing adequate breastfeeding support. This will be achieved by recognizing parents' inhibiting factors to the transition to parenthood and helping them be successful.
99.	1. Prenatal breastfeeding education 2. PubMed 3. 1,464	Abuidhail, J., Mirayan, L., & Jaradat, D. (2019). Evaluating	1. The purpose of this study was to evaluate a prenatal web-based breastfeeding	None	1. QN 2. Prospective, randomized control trial (RCT)	1. Infant feeding knowledge and attitudes (IIFAS). Breastfeeding Self-	1. Descriptive – % and mean. Inferential - SD, ANCOVA, p value,	1. ANCOVA test found the web-based breastfeeding educational	1. Limitations to this study are the sample of individuals was obtained from a

		effects of prenatal web-based breastfeeding education for pregnant mothers in their third trimester of pregnancy: Prospective randomized control trial. *Midwifery, 69,* 143-149. https. https://doi.org/10.1016/j.midw.2018.11.015	education program and its effects on breastfeeding knowledge, attitudes, and self-efficacy. 2. Does utilizing a prenatal web-based breastfeeding educational program prior to delivery improve women's breastfeeding self-efficacy postpartum? 3. IV- prenatal web-based breastfeeding education program. DV- Breastfeeding knowledge, attitudes, exclusivity, self-efficacy		3. Consecutive sample technique. Total of 118 pregnant mothers >= 18 years of age, 29-36 weeks gestational age, internet users	Efficacy Scale (BSES). 2. Infant feeding knowledge and attitudes (IIFAS) had 17-items and used Likert scale. Breastfeeding Self-Efficacy Scale (BSES) was adapted from the original 33 items to a shortened 14-item scale. 3. Ordinal data through 5-point Likert scale, breastfeeding self-efficacy scale	Cronbach alpha value 2. The data collection tools used in this study were validated and found reliable with the Cronbach's alpha value of 0.86. 3. Level I of the evidence hierarchy	program group to have a $p < 0.05$. Mean age of women (27.7, SD = 4.9). Multiparous (n = 63, 56.8%). Nulliparous (n = 48, 43.2%). Mean income (mean = $406, SD = $276.3). Bachelor's degree (n = 54, 49%). Housewives (n = 89, 80.2%). Vaginal deliveries (n = 59, 58%). Experimental group BSES pre-intervention (n = 36, 64.3%) & post intervention (n = 45, 80.4%). Control group with BSES pre-intervention (n = 38, 67.9%) & post intervention (n = 39, 69.6%). Neutral results for both groups on IIFAS. Experimental	private clinic and the follow up interviews should have been performed in person instead of via telephone. 2. Adaptations need to be made to the prenatal breastfeeding website by making it more enticing to pregnant and/or breastfeeding mothers. 3. Since this was the first study to utilize a web-based breastfeeding education program for pregnant mothers, further studies need to be conducted to evaluate the improvements in women's breastfeeding self-efficacy scores.

								and control groups BSES scores [F(1,109) = 1.5, p = 0.22, partial eta squared = 0.014]. Experimental and control groups IIFAS scores [F(1,109)= 0.243, p = 0.62, partial eta squared = 0.002]. Neutral attitudes results on breastfeeding. 2. Breastfeeding self-efficacy in the experimental group went from 64.3% before the intervention to 80.4% after the intervention. Empowering individuals with a prenatal breastfeeding education program can improve breastfeeding self-efficacy,	

								knowledge, attitudes towards breastfeeding.	
110.	1. Prenatal breastfeeding education 2. PubMed 3. 1,464	Addicks, S. H., & McNeil, D. W. (2019). Randomized Controlled Trial of Motivational Interviewing to Support Breastfeeding Among Appalachian Women. *Journal of Obstetric, Gynecologic & Neonatal Nursing, 48*(4), 418-432. https://doi.org/10.1016/j.jogn.2019.05.003	1. The purpose of this study was to evaluate the effects of prenatal motivational interviewing during the third trimester of pregnancy on postpartum breastfeeding rates. 2. Does prenatal motivational interviewing improve breastfeeding in Appalachian women? 3. IV – motivational interviewing (MI) for breastfeeding support, Appalachian pregnant women DV- breastfeeding exclusivity rates, self-efficacy, and intentions to breastfeed	1. Theory of Planned Behavior (TPB)	1. QN 2. Single-blind, randomized control trial (RCT) 3. Random sample of 81 pregnant women with a gestational age ranging from 28 – 39 weeks who live in the Appalachia area with telephone access, primarily white (n = 72, 88.9%)	1. Iowa Infant Feeding Attitudes Scale (IIFAS). 2. 17-items on IIFAS using 5-point Likert scale. 3. Ordinal data through 5-point Likert scale, breastfeeding self-efficacy scale. Nominal data with yes, no question of if mothers ever breastfed.	1. Descriptive – % and mean. Inferential – p value, Cronbach's alpha 2. The Iowa Infant Feeding Attitudes Scale (IIFAS) was found to be reliable with a result of 0.85- 0.86 with the Cronbach's alpha. The IIFAS has been found valid and used in several other studies. 3. Level I of the evidence hierarchy	1. Motivational Interview group reported higher rates of breastfeedingà $X2 (1, N = 79) = 4.30$, $p = 0.040$. Attitudes towards breastfeeding in motivational interview (MI) group after intervention ($p < .05$). 2. Healthcare professionals can use motivational interviewing techniques to improve postpartum breastfeeding rates.	1. There is a high probability there was selection basis due to the overwhelming number of whites selected for the study. Also, the Appalachian women had income rates much higher than the poverty line in Appalachia, which could prevent generalization of the study. 2. Further studies need to be conducted by nurses and/or lactation consultants using motivational interviewing (MI) as their intervention in their study. 3. Healthcare professionals can use

									motivational interviewing techniques to improve postpartum breastfeeding rates.
111.	1. Improvement in exclusive breastfeeding rates using theory 2. Google Scholar 3. 17,000	Zhu, Y., Zhang, Z., Ling, Y., & Wan, H. (2017). Impact of intervention on breastfeeding outcomes and determinates based on theory of planned behavior. *Women and Birth, 30*(2), 146-152. https://doi.org/10.1016/j.wombi.2016.09.011	1. The purpose of this study was to improve exclusive breastfeeding rates by enhancing pregnant women's knowledge and attitudes towards breastfeeding. 2. Does implementing the use of the theory of planned behavior (TPB) improve exclusive breastfeeding rates in new mothers? 3. IV- Theory of Planned Behavior (TPB) interventions DV- exclusive breastfeeding rates	1. Theory of Planned Behavior (TPB)	1. QN 2. Participants were chosen for the study through permuted block random sampling method, theory of planned behavior (TPB) based intervention program 3. n = 285, total of 285 primiparous women with no pre-existing obstetric conditions, >= 37 weeks gestational age, newborns with no issues interfering with breastfeeding	1. Breastfeeding Knowledge Scale (BKS), Modified Breastfeeding Attrition Prediction Tool (BAPT) 2. Breastfeeding Knowledge Scale (BKS) uses 5-point Likert scale with 25 items. Modified Breastfeeding Attrition Prediction Tool (BAPT) uses 5-point Likert scale and had 29, 8, and 10 items. 3. Ordinal for breastfeeding knowledge, breastfeeding attitude scores, use of 5-point Likert scale	1. Descriptive – % and mean (mean age of participants was 29 years old) Inferential—Chi-square, t-test, p values, Cronbach's alpha coefficient, analysis of variance (ANOVA), standard deviation (SD) 2. The Breastfeeding Knowledge Scale (BKS) was found reliable through a Cronbach's alpha coefficient of 0.80. The researchers in the study stated validity of the Breastfeeding Knowledge Scale (BKS) and Modified Breastfeeding Attrition Prediction Tool (BAPT) was verified through several other studies and in other countries. 3. Level II of the evidence hierarchy	1. Breastfeeding knowledge-intervention group ($p = 0.001$), at 3 days knowledge scores ($p = 0.034$), and 6 weeks after breastfeeding knowledge intervention ($p < 0.001$). Breastfeeding attitude scores-intervention group at 3 days ($p = 0.018$) and attitude scores at 6 weeks ($p < 0.001$). Breastfeeding subjective norm- scores at 3 days ($p < 0.001$) and 6 weeks ($p < 0.001$). Exclusively breastfeeding rates in theory	1. This study was very good. However, the researchers did identify a limitation to be the length of time participants were studied. 2. The researchers recommended conducting a study with this intervention implemented by certified lactation consultants and to extend the six-week period to a longer amount of time. 3. The Theory of Planned Behavior (TPB) formed interventions were found to increase exclusive breastfeeding

								of planned behavior (TPB) intervention group were 40.13% at 3 days and 10.93% in control group, whereas at 6 weeks exclusive breastfeeding rates in intervention group were 57.32% and 29.67% in control group: 3 days ($p < 0.001$) and 6 weeks ($p < 0.001$). 2. Theory of Planned Behavior (TPB) can be utilized to increase exclusively breastfeeding rates in postpartum first-time mothers.	rates, breastfeeding knowledge, and breastfeeding attitudes over a six-week period.
1.	1. Increasing exclusive breastfeeding rates in rural areas	Jacobson, L. T., Zackula, R., Redmond, M. L., Duong, J.,	1. The purpose of this study was to discover what rural English and Spanish pregnant	None	1. QL 2. Purposive sampling 3. n = 36, women aged	1. Pre-session surveys. Focus group sessions. One structured interview.	1. Descriptive - %, mean, SD, and frequencies. Inferential – none identified	1. Focus on five domains including conscientiousness, health	1. A limitation of this study is the extremely small sample size of 36

	2. PubMed 3. 175	& Collins, T. C. (2018). Pioneer baby: suggestions for pre- and postnatal health promotion programs from rural English and Spanish-speaking pregnant and postpartum women. *Journal of Behavioral Medicine, 41*(5), 653-667. https://doi.org/10.1007/s10865-018-9930-y	and postpartum women want in a health promotion program. 2. What information do rural pregnant and postpartum women want provided in health promotion programs? 3. IV- None DV- None		18 years old or older, any gestational age, and postpartum women; women must be able to read English and/or Spanish	2. 32-item checklist for the interviews and focus groups and surveys 3. Ordinal for surveys. Nominal for race/ethnicity and age	2. The PhD researchers created the focus group scripts. The focus group scripts need to be validated in further research studies. 3. Level III of the evidence hierarchy	communication, technology, barriers, education, and support to promote continuity of care. White (45.7%), Hispanic (31.4%), third trimester (70%), over 1/5 of participations (23.5%) had a family history of cardiovascular disease. In this study, women identified five health promotion program needs, including education on exercise, nutrition, breastfeeding, fetal monitoring/kick counts, and peer-to-peer education. 2. Providing a health promotion program for rural women	women. Another limitation is the fact only 17 of the women selected actually participated in the study. 2. Researchers recommend closure of gaps in educational programs in rural areas through collaboration of health care providers and other community members. 3. International Board Certified Lactation Consultants (IBCLCs) can collaborate with obstetricians in rural area offices to provide prenatal breastfeeding educational programs to promote future health.

								on breastfeeding can help women have a healthier life.	
2.	1. Effect of IBCLC on exclusive breastfeeding rates 2. PubMed 3. 4	Sanchez, A., Farahi, N., Flower, K. B., & Page, C. P. (2019). Improved Breastfeeding Outcomes Following an On-site Support Intervention in an Academic Family Medicine Center. *Family Medicine, 51*(10), 836-840. https://doi.org/10.22454/fammed.2019.698323	1. The purpose of this study was to evaluate the effect of breastfeeding support on duration of exclusive breastfeeding at a family medicine clinic with an IBCLC providing lactation consults. 2. Does an IBCLC providing lactation consults at a family clinic improve duration and rates of exclusive breastfeeding in clients? 3. IV- on-site lactation consults with an International Board Certified Lactation Consultant (IBCLC) DV- exclusive breastfeeding duration	None	1. QN 2. Retrospective chart review 3. n = 281, women and their infants	1. Qualtrics chart extraction tool to pull data from the electronic medical record (EMR) 2. 281 newborn records identified as being part of intervention in clinic 3. Ordinal for exclusive breastfeeding rates, mothers' race. Nominal for age	1. Descriptive – % and mean. Inferential – bivariate and multiple logistic regression, p value, X2 tests 2. The researchers validated their data through STATA version 14 software for an in-depth data analysis. Reliability- Providing breastfeeding support in clinics to improve exclusive breastfeeding rates has been conducted in other studies. 3. Level II of the evidence hierarchy	1. Prior to breastfeeding supported provided by an IBCLC rates of exclusively breastfeeding at 2 months were 58.7%, whereas after the intervention, rates of exclusively breastfeeding at 2 months were 77.8% (p = 0.045). At 4 and 6 months prior to, and after the implementation of the IBCLC lactation services, exclusively breastfeeding rates were as follows: 50.5% versus 52.2%, p = 0.062 and 44.0% versus 49.3%, p = 0.118. Any breastfeeding	1. Limitations defined by the researchers were the sample size particularly at the 6-month mark and the fact the study was implemented at an academic family medicine practice, making it difficult to generalize their findings to the overall population. 2. Suggestions were made by the researchers to due further studies combining both quantitative and qualitative research on breastfeeding support at clinics. 3. Use of lactation support services provided by an

								at 2 months, 4 months, and 6 months pre and post use of an IBCLC for breastfeeding support: at 2 months 71.7% versus 86.7% (p = 0.05), at 4 months 61.5% versus 77.1% (p = 0.08), and at 6 months 50.7% versus 64.4% (p = 0.09). 2. Utilization of an IBCLC for lactation consults in a family clinic can improve not only exclusive breastfeeding rates in general, but the duration of breastfeeding as well.	IBCLC does not only increase exclusive breastfeeding rates, but duration of breastfeeding at 2, 4 and 6 months of the infant's age as well.
3.	1. Effect of prenatal breastfeeding education on exclusive breastfeeding rates 2. Google Scholar	Farr, R. S., Rahman, F., O'Riordan, M. A., & Furman, L. (2019). Assessing the Feasibility and	1. The purpose of this study was to increase intention to exclusive breastfeed, in-hospital exclusive breastfeeding rates (EBF), and evaluate the	None	1. QN 2. Descriptive study using longitudinal surveys with follow up chart review. 3. N = 243, pregnant	1. Pre-test survey and post-test survey. Free app called Coffective for breastfeeding interventions using REDCap on the iPad for web security.	1. Descriptive - %, frequencies, mean. Inferential – p values, chi-squared analyses, McNemar's test, Fisher's exact test 2. Unable to validate reliability of two	1. Change of intention for no breastfeeding to intention to breastfeed significantly increased after champion and positive	1. Limitations identified were the small sample size, no control group, and an inability to do an analysis for 2-week follow-up

	3. 17,300	Effectiveness of Two Prenatal Breastfeeding Intervention Apps in Promoting Postpartum In-Hospital Exclusive Breastfeeding. *Breastfeeding Medicine, 14*(10), 724-730. https://doi.org/10.1089/bfm.2019.0053	participants satisfaction of the interventions on the iPad. 2. Do two iPad-based breastfeeding interventions improve intention to breastfeed and exclusive breastfeeding rates (EBF) in the hospital? 3. IV- two iPad-based breastfeeding interventions DV- exclusive breastfeeding		women 18 years or older, also ages 14-17 (if obtained parental consent), 28-32 gestational age	2. Approximately 20 questions on pre and posttest surveys. 5-point Likert scale questions. 3. Ordinal for exclusive breastfeeding, use of Likert scale, percent of intention to breastfeed	iPad breastfeeding interventions using app as they were created by the researchers. 3. Level III of the evidence hierarchy	messaging interventions on app— exclusive breastfeeding (80% versus 20%; $p < 0.0001$ for change) & (83% versus 17%; $p < 0.0001$ for change) 2. There is a potential for the two iPad-based breastfeeding interventions to help with increasing exclusive breastfeeding rates (EBF) in the hospital.	data due to incomplete data in the medical record. 2. Since this study was conducted in an urban area, further research needs to be implemented in rural areas to validate the two iPad breastfeeding interventions. 3. Technology use through an app can be a way to increase exclusive breastfeeding rates (EBF) in the hospital and possibly even change mothers' intentions not to breastfeed to breastfeed.
4.	1. Breastfeeding, mixed method 2. Google Scholar 3. 16,800	Feenstra, M. M., Jørgine Kirkeby, M., Thygesen, M., Danbjørg, D. B., & Kronborg, H. (2018). Early breastfeeding problems: A	1. The purpose of this study was to identify breastfeeding problems associated with early cessation of breastfeeding. 2. What do mothers identify as breastfeeding	Bandura's social cognitive theory	1. Mixed method 2. cross-sectional design 3. N = 1437, Danish women, 37 weeks gestation age or greater,	1. Self-administered questionnaires 2. Unsure of number of questions. 3. Nominal with yes, no questions. Nominal with age. Ordinal with five-point Likert scale use.	1. Descriptive = % Inferential = multiple logistic regression, Chi square tests, p value, correlation analysis, confidence intervals, odds ratio. Quantitative analysis using	1. Women who reported breastfeeding problems (40%), inadequate latch (40%), cracked/sore nipples (38%), women who had already	1. A limitation identified is that the data was collected in the year 2004, but the researchers' study was not published until 2018. Another limitation could potentially be

		mixed method study of mothers' experiences. *Sexual & Reproductive Healthcare*, *16*, 167–174. https://doi.org/10.1016/j.srhc.2018.04.003	problems that led to early discontinuation of their breastfeeding? 3. IV – questionnaires DV- breastfeeding duration		who had chosen breastfeeding, and given birth to one child only		STATA version 9 software. 2. Researchers validated their questions through confirmation the open and close ended questions had been used in other international studies and found reliable. 3. Level V of the evidence hierarchy	ceased breastfeeding (4%), reports of early breastfeeding problems (89%). 99% of women in study wanted to breastfeed (p = 0.11). Women still breastfeeding even with reported breastfeeding problems (88%) (p – 0.00). 2. Breastfeeding problems leading to early cessation of breastfeeding included low breastfeeding self-efficacy, sore nipples, infant's inability to latch, low milk supply, over supply of milk, mastitis, lack of support, and birth complications.	the data was pulled from an intervention study through secondary analysis. 2. More research needs to be conducted with breastfeeding support in the postpartum period. 3. Healthcare professionals who are supportive and encouraging can increase women's breastfeeding self-efficacy, thus, leading to longer durations of breastfeeding.
5.	1. Breastfeeding, mixed method	Colaceci, S., Giusti, A., De	1. The purpose of this study was to	None	1. Mixed method	1. Focus groups and interviews. Infant	1. Descriptive- %, bivariate analysis,	1. In this study, there were	1. A limitation of this study is

	2. Google Scholar 3. 16,800	Angelis, A., Della Barba, M. I., De Vincenti, A. Y., Vellone, E., & Alvaro, R. (2016). Medications, "Natural" Products, and Pharmacovigilance during Breastfeeding. *Journal of Human Lactation*, *32* (2), 324–332. https://doi.org/10.1177/0890334415619746	identify if women are faced with the decision of medication and the possibility of ceasing breastfeeding or harming their infant what is their opinion on the matter. 2. What are women's opinions on medication use while breastfeeding? 3. IV-questionnaire DV-women's opinions on breastfeeding and medication use		2. Sequential exploratory design 3. Qualitative portion of study à N = 25; Sample included any pregnant women. Quantitative portion of studyà N = 248; Sample included new mothers and pregnant women	feeding questionnaire. 2. Total of 5 semi structured questions for focus groups and interviews. Total of 40 questions on infant feeding questionnaire. 3. Ordinal with five-point Likert scale use. Nominal for yes/no questions, nationality	SD, mean Inferential – p value, confidence intervals, odds ratio 2. The researchers validated there is limited research on breastfeeding and use of drugs while continuing breastfeeding. 3. Level V of the evidence hierarchy	three attitudes regarding medication use while breastfeeding, which included discontinuation of breastfeeding, coping with the pain, or choosing "natural" treatment routes. The "endure the pain" opinion – (95% CI, 1.6-9.3). 2. If it means the choosing between medication and stop breastfeeding, breastfeeding women are likely to avoid medication, even if it means they are putting their health at risk.	the extremely small sample size in the qualitative portion of the research study. 2. Further studies should be conducted on women's attitudes regarding breastfeeding and medication use. 3. Providers need to be aware of the medication and natural therapies safety during breastfeeding and give their patients accurate information. Providing the correct information regarding medication safety and breastfeeding will prevent ceasing breastfeeding due to medication use.

Appendix F

Breastfeeding Knowledge, Attitude, and Confidence scale (BKACs)

Item

1. Breastfeeding cuts down on the mother's bleeding after delivery.
2. Breast milk makes up a complete diet for baby. No extras (foods, vitamins, etc) are needed until the baby is closest to 1 year of age.
3. If your breasts are small, you might not have enough milk to feed the baby.
4. When the mother is sick with the flu or a bad cold, she can usually continue to breastfeed her baby.
5. Babies who are breastfed tend to have fewer allergies than babies who get formula.
6. The pill is the best way to keep from getting pregnant while you are breastfeeding.
7. You shouldn't try to breastfeed if you are planning to go back to work or school since you won't be able to be with your baby for feedings.
8. The more often you breastfeed, the more milk you will have for your baby.
9. Babies who are breastfed tend to get fewer infections than babies who get formula.
10. Many women are not able to make enough milk to feed their baby.
11. The best food for a newborn is:
    a. Breast milk
    b. Formula
    c. Breast milk and water
12. Because babies may get a bad reaction to certain foods, breastfeeding mothers should never eat:
    a. Pizza or other spicy foods
    b. Coffee or tea or other drinks with caffeine
    c. All of the above
    d. None of these are correct
13. After the baby loses weight following birth, he or she will probably gain it back faster if:
    a. Baby is breastfed
    b. Baby is bottle fed
    c. Neither is correct
14. You shouldn't try to breastfeed if you:
    a. Have twins
    b. Have a cesarean section
    c. Drink a lot of alcoholic beverages
15. Breastfeeding mothers' nipples get sore if:
    a. The baby's feeding position is not right
    b. The mother has light-colored skin
    c. This is the first baby she has breastfed
16. When you breastfeed, the best way to tell if the baby is getting enough milk is that:
    a. Baby does not suck on fist after done nursing
    b. Baby does not cry
    c. Baby has 6 or more wet diapers in 24 hours
17. When you breastfeed:
    a. You may get your figure back easier
    b. You nearly always gain weight
    c. You may feel weak when you feed your baby
18. If you breastfeed:
    a. No one else can help you with the baby since you have to feed him or her
    b. More of your time will be taken up by the baby than if you bottle feed
    c. It will be very difficult to feed the baby in public places
    d. None of the above are correct
19. Breastfeeding will probably make:
    a. Your breasts sag
    b. Your breasts larger after your stop breastfeeding your baby
    c. No difference in the size or shape of your breasts
20. Breastfed babies need:
    a. Only breast milk for the first 4 to 6 months
    b. A bottle of formula every day or so
    c. Extra water daily

Item	Desired response
The consistency of breast milk and formula is equal.	Disagree
It is recommended to breastfeed a healthy infant regularly.	Disagree
The infant sucks in the same way from mother's breast and bottle.*	Disagree
Most mothers with small breasts have insufficient lactation.*	Disagree
Most mothers have sufficient breast milk for an infant.*	Agree
A healthy full-term infant does not need complementary feeds in the maternity hospital.	Agree
Bottle feeding may complicate the infant's learning of the attachment.	Agree
If the breast feeding lasts over 10 minutes, the nipples will be cracked.†	Disagree
Cracked nipples are because the infant is allowed to suckle too long in the first days.†	Disagree
A dummy should be used to prevent cracked nipples.‡	Disagree
Lactation is dependent on how often the infant is breastfed.	Agree
Donor milk is used in the making of the formula.§	Disagree
Five wet diapers in a 24-hour period is a sign of adequate intake when the infant is at home.§	Agree
There is a need to give water to all infants, including exclusively breastfed infants, especially on hot days.‡	Disagree
It is recommended to follow a special time schedule while breastfeeding.‡	Disagree
A breastfed infant needs complementary food from at least 4 months of age.*	Disagree
If a breastfeeding mother has diarrhea, it is recommended to cease breastfeeding.†	Disagree
Breastfeeding at night increases lactation.§	Agree
It is recommended to pump the breasts after alcohol consumption before the next breastfeeding.†	Disagree
Breastfed or formula-fed infants have as many ear infections until they are 1 year old.‡	Disagree
What kind of benefits do breastfeeding and breast milk have? (open-ended question)‖	one benefit is named
Sometimes it may feel that milk is insufficient. How can the lactation be increased? (open-ended question)**	one way is named

*One missing value.
†Two missing values.
‡Three missing values.
§Four missing values.
‖25 missing answers.
**40 missing answers.

(Casal et al., 2016)

(Laantera et al., 2010)

The BKACs can be reproduced in further research projects.

Appendix G

Research Subject Information Sheet

RADFORD UNIVERSITY

Title: Empowering Primary Care Providers in Rural Clinics with Breastfeeding Education

Investigator: Anna Reavis, BSN, RNC-OB, RNC-MNN, IBCLC, C-EFM, CDCES, C-ONQS, RNC-IAP

areavis@radford.edu

Radford University invites you to participate in a research project entitled "**Empowering Primary Care Providers in Rural Clinics with Breastfeeding Education.**" Researchers at Radford University are conducting the project, including Anna Reavis, a student researcher, and Dr. Marjorie Young, the primary investigator. This study investigates whether increasing breastfeeding education for primary care providers (PCPs) and nurses in rural clinics leads to implementation of breastfeeding education for their patients in the first trimester of pregnancy.

Choosing to participate in this research project is entirely voluntary. At any part of the project, you may withdraw. Participating in the project means there will be a virtual zoom 20-minute educational course and pre- and post-surveys. The surveys are quick and take less than 15 minutes to complete. Once the survey data gets downloaded, the primary investigator (PI) and student researcher will immediately delete IP addresses to protect the research subjects. Review of the research subject information sheet and participating in the Qualtrics surveys means you are giving the researchers informed consent.

Survey responses are confidential, and the researchers will collect no identifying information. Therefore, participating in the project has minimal risk. There is no more risk of participating in this project than would be encountered in everyday use of the internet.

Dr. Werth, Chief Executive Officer (CEO) of the four Tri-Area Community Health Centers, has given his key support for the project to occur at his rural primary care facilities and he will schedule the project during monthly training as an optional training for qualified staff to attend. These staff members include Doctor of Nursing Practice (DNPs), Family Nurse Practitioners (FNPs), Doctor of Osteopathic Medicine (DOs), Medical Doctors (MDs), Physician Assistants (PAs), Certified Pediatric Nurse Practitioners (CPNPs), Registered Nurses (RNs), and Licensed Practical Nurses (LPNs).

This study was approved by the Radford University Committee for the Review of Human Subjects Research. If you have questions or concerns about your rights as a research subject or have complaints about this study, you should contact Dr. Jeanne Mekolichick, Institutional Official and Associate Provost for Research, Faculty Success, and Strategic Initiatives, jmekolic@radford.edu, 540.831.6504.

If you agree to participate, please ***press the arrow button at the bottom right of the screen to proceed to the Qualtrics survey***. *Otherwise use the X at the upper right corner to close this window and disconnect.*

Thank you.

Appendix H

Level of Evidence

Article	Level of Evidence	Type of Evidence
Academy of Breastfeeding Medicine (ABM) Clinical Protocols (ABM, 2019)	I	Clinical Protocols
Breastfeeding knowledge and attitudes of Health Professional Students: A Systematic Review (Yang et al., 2018)	I	Systematic Review
Support for healthy breastfeeding mothers with healthy term babies (McFadden et al., 2017)	I	Systematic Review
Impact of intervention on breastfeeding outcomes and determinates based on theory of planned behavior (Zhu et al., 2017)	II	Randomized Controlled Trial (RCT)
Randomized Controlled Trial of Motivational Interviewing to Support Breastfeeding Among Appalachian Women (Addicks & McNeil, 2019)	II	Randomized Controlled Trial (RCT)
Evaluating effects of prenatal web-based breastfeeding education for pregnant mothers in their third trimester of pregnancy: Prospective randomized control trial (Abuidhail et al., 2019)	II	Randomized Controlled Trial (RCT)
Effectiveness of an integrated breastfeeding education		

program to improve self-efficacy and exclusive breastfeeding rate: A single-blind, randomized controlled study (Tseng et al., 2020)	II	Randomized Control Trial (RCT)
Feasibility and Effectiveness of Telelactation Among Rural Breastfeeding Women (Uscher-Pines et al., 2020)	II	Randomized Controlled Trial (RCT)
Mobile phone support to sustain exclusive breastfeeding in the community after hospital delivery and counseling: a quasi-experimental study (Jerin et al., 2020)	III	Quasi-experimental study (pre- and post-tests)
The effects of a hospital-based perinatal breastfeeding program on exclusive breastfeeding in Taiwan: a quasi-experimental study (Yeh et al., 2020)	III	Quasi-experimental study (pre- and post-tests)
The rates and factors of perceived insufficient milk supply: A systematic review (Huang et al., 2021)	I	Systematic Review
The effectiveness of primary care-based interventions to promote breastfeeding: Systematic evidence review and meta-analysis for the US Preventive Services Task Force (Guise et al., 2003)	V	Systematic evidence review and meta-analysis

Appendix I

Letter of Support

Tri-Area Community Health

CORPORATE OFFICE
PO Box 9
14168 Danville Pike
Laurel Fork VA 24352
276/398-2292
276/398-3331FAX

October 10, 2022

Anna Reavis
School of Nursing
Radford University
Radford, VA 24141

Dear Ms. Reavis:

As Chief Executive Officer of Tri-Area Community Health, I am pleased to support your efforts to empower Primary Care Providers and nurses to initiate a breastfeeding education discussion with pregnant patients in the first trimester of pregnancy. We agree that professional medical support can have a positive influence on the decision to initiate and sustain breastfeeding.

I have reviewed and support your project, including your proposed interventions and assessment tools. We welcome your breastfeeding educational webinar led by an International Board-Certified Lactation Consultant offered via Zoom technology. We will assist the implementation of the project by notifying the eligible staff of the opportunity to participate in your project. I understand that implementation of your project is expected to be in Spring, 2023, but I expect we will continue to offer your breastfeeding education to all eligible medical staff to help improve long-term health outcomes for mothers and children.

We appreciate your choosing Tri-Area Community Health for your project. We look forward to collaborating with you to integrate evidence-based practice into our rural primary care setting.

Sincerely,

James L. Werth, Jr.

James L. Werth, Jr., Ph.D., ABPP
Chief Executive Officer
jwerth@triarea.org

Appendix J

Radford University IRB Approval

RADFORD UNIVERSITY

Research Compliance Office

Institutional Animal Care and Use Committee / Institutional Review Board

March 06, 2023

TO:	Marjorie Young, DNP
RE:	Initial Expedited Approval
STUDY TITLE:	Empowering Primary Care Providers in Rural Clinics with Breastfeeding Education
IRB REFERENCE #:	2022-128
SUBMISSION TYPE:	IRB Initial Submission
ACTION:	Approved
APPROVAL PERIOD:	March 06, 2023 – March 05, 2026

The above-referenced study has been approved by Radford University's Institutional Review Board (IRB). Please note that if your research includes stamped materials, they will be provided with this letter and must be used when conducting your research. A copy of your approved IRB protocol is available for your records in IRBManager under your dashboard of active protocols.

Your study has been approved under **Expedited Category 7: Research is on individual or group characteristics of behavior (including, but not limited to research on perception, cognition, motivation, identity, communication, cultural beliefs or practices, and social behavior) or the research employs survey, interviews, oral history, focus group, program evaluation, human factors evaluation, or quality assurance methodologies).**

You are approved for the enrollment of 16 participants.

Note: The number approved is the number of study participants is defined as the number who enroll in the project and NOT the number of subjects with usable data for analysis. If this should change, you must submit an amendment to increase subject numbers.

Your IRB approval period ends on March 05, 2026. If the study remains ongoing after the project end date, you must submit a three-year check-in application no later than ten (10) days prior to the expiration of this approval. If the project is no longer being pursued, a closure report must be submitted.

Should you need to make changes in your protocol, you must submit a request for amendment for review and approval before implementing the changes. Amendments must be submitted via the IRBManager system.

As the principal investigator for this project, you are ultimately responsible for ensuring that your study is conducted in an ethical manner. You are also responsible for filing all reports related to this project.

Radford University IRB
Approval Date: March 06, 2023