Improving Prenatal Breastfeeding Education in a Baby-Friendly Facility in Hawai`i County: A Quality Improvement Project

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ABSTRACT

Problem: Recommendations from international and national organizations include promoting exclusive breastfeeding for the first six months. While Hawai`i is one of the states with the highest breastfeeding rates, we still fall short of recommendations. North Hawai`i Community Hospital (NHCH) has Baby-Friendly designation, and a policy following the Ten Steps to Successful Breastfeeding, however, the education provided to patients is inconsistent and non-standardized. This leads to some patients being admitted for labor having potentially conflicting, limited, or no breastfeeding knowledge. **Purpose:** The purpose of this project was to address this gap in care by creating a prenatal breastfeeding education packet. By increasing and improving prenatal education, the hope is to then increase exclusive breastfeeding rates. **Methods:** A prenatal breastfeeding education packet was created, and presented twice. It was first presented to providers in an educational session, which also addressed current recommendations regarding breastfeeding, as well as the facility's infant feeding policy, and basic breastfeeding knowledge. The packet was then presented to prenatal patients in multiple, informal educational sessions. **Analysis:** Both groups were given pre- and posttests to evaluate knowledge of the materials before and after each educational session, and each group was asked four evaluation questions. Demographic data was also collected from each participant. Each group's data were analyzed separately, via paired t-tests and descriptive statistics. **Results:** While the provider group's mean test score difference was not statistically significant, they all found great value in the education packet. The patient group's mean test scores showed statistically significant improvement, and they also found great value in the packet for prenatal patients.

Table of Contents

Abstract……ii

List of Figures……...…….…….vi

List of Abbreviations.……...……..vii

CHAPTER I: STATEMENT OF THE PROBLEM, PROBLEM AIM AND OBJECTIVES……1

A. Introduction and Background …….1

B. Problem Statement……..…….7

C. Significance to Healthcare in Hawai`i……..……8

D. Needs Assessment……..……..9

E. Assumptions……...18

F. Project Goal……....……18

i. Aims and Objectives……..……19

G. Summary……20

CHAPTER II: THEORETICAL FRAMEWORK AND REVIEW OF LITERATURE..…..…...21

A. Theoretical Framework……..……....21

B. Review of Literature……...……...24

C. Summary…….…...……..……..34

CHAPTER III: PROJECT DESIGN AND EVALUATION PLAN……..……....35

A. Project Design…….....……..……..35

B. Methodology…..…….....37

i. Instruments…….43

ii. Data Analysis…….45

iii. Protection of Human Subjects and Ethical Considerations…….45

C. Summary…..…….....46

CHAPTER IV: RESULTS…….48

A. Provider Participant Results……...…48

B. Patient Participant Results…….…..…51

C. Discussion and Summary of Results……..55

CHAPTER V: RECOMOMENDATIONS AND CONCLUSIONS…….57

A. Outcomes Evaluation…….……57

i. Limitations……...……..57

ii. Facilitators…….…….58

B. Implications for Practice……59

C. Conclusion…….60

Appendix A: Permission to Use Breastfeeding Knowledge Questionnaire (BKQ)...……..…...62

Appendix B: Permissions to Use Publicly Sourced Images and Educational Materials……...63

Appendix C: Patient Consent Handout..…….……...……64

Appendix D: Provider Consent Handout.……..66

Appendix E: Patient Demographics Questionnaire……....68

Appendix F: Provider Demographics Questionnaire…….....70

Appendix G: Patient Pretest (BKQ)…..…….71

Appendix H: Patient Posttest (BKQ with Evaluation Questions)…….....72

Appendix I: Provider Pretest (Modified BKQ)……..……73

Appendix J: Provider Posttest (Modified BKQ with Evaluation Questions)……..75

Appendix K: Patient Recruitment Flyer……..…...78

Appendix L: Prenatal Breastfeeding Education Packet……...…...79

Appendix M: Letter of Support from NHCH Administration…….....84

Appendix N: UH IRB Approval as Exempt Project……85

Appendix O: QMC RIRC Project Approval as “Not Human Subjects Research”……..86

References……..…87

List of Figures

Figure 1: Leavell and Clark's Three Levels of Prevention……..22

Figure 2: A Classification of Prevention Strategies……....23

Figure 3: FADE Model……..…….....37

List of Abbreviations

- AAP: American Academy of Pediatrics
- ACOG: American College of Obstetricians and Gynecologists
- ACS: American Cancer Society
- AWHONN: Association of Women's Health, Obstetric, and Neonatal Nurses
- BFHI: Baby-Friendly Hospital Initiative
- BKQ: Breastfeeding Knowledge Questionnaire
- CDC: Centers for Disease Control and Prevention
- CNM: Certified Nurse Midwife
- FADE/E: FADE QI Model = Focus, Analyze, Develop, Execute, Evaluate
- FBU: Family Birthing Unit
- FM MD: Family Medicine Physician
- HOP: Hale Ola Pono Primary Care Clinic
- HP: Healthy People
- IRB: Institutional Review Board
- LOP: Levels of Prevention Model
- MOU/A: Memorandum of Understanding/Agreement
- NAPNAP: National Association of Pediatric Nurse Practitioners
- NHCH: North Hawai`i Community Hospital
- OB MD: Obstetrics & Gynecology Physician
- PIP: Practice Inquiry Project
- QHS/QMC: Queen's Health Systems/Queen's Medical Center
- QI: Quality Improvement
- RN: Registered Nurse
- UH(H): University of Hawai`i (at Hilo)
- UNICEF: United Nations International Children's Emergency Fund
- WHO: World Health Organization
- WIC: U.S. Department of Agriculture's Special Supplemental Nutrition Program for Women, Infants, and Children
- WWC: Waimea Women's Center

CHAPTER I:

STATEMENT OF THE PROBLEM, PROJECT AIM AND OBJECTIVES

Worldwide, breastfeeding is recognized as the ideal feeding method for all infants, and it is also beneficial for mothers. The World Health Organization (WHO) and the United Nations International Children's Emergency Fund (UNICEF) recommend initiation of breastfeeding within the first hour of life, exclusive breastfeeding for all infants until six months of age, and continued breastfeeding in conjunction with age- and nutritionally-appropriate, complementary foods from six months through at least two years of age (UNICEF, 2015). In the United States, both the American Academy of Pediatrics (AAP) and the National Association of Pediatric Nurse Practitioners (NAPNAP) have published official organizational policies stating the importance of exclusive breastfeeding for six months, with continued breastfeeding with complementary foods from six months to at least one year of age or longer (Busch, Silbert-Flagg, Ryngaert & Scott, 2018; Eidelman & Schanler, 2012). Research has demonstrated both long- and short-term benefits to both mother and child. Breastmilk is convenient, free, and is produced to meet the unique and exact needs of each individual child. The composition of breastmilk changes as the child grows—by days, weeks, and months—in order to continue to meet their specific nutritional and developmental needs (USDA, n.d.). It has been said that "breastfeeding saves more lives than any other preventive intervention" (UNICEF, 2015). So, then why are so many infants still not being exclusively breastfed, as all of these organizations recommend?

Background

There have been strides made to increase our breastfeeding rates in the United States. Healthy People (HP) is a national, science-based set of objectives to be reached within the following ten years, with the goal of improving overall health and quality of life for all

Americans. Each decade, they establish benchmark goals with corresponding objectives regarding how to meet those goals. The latest set of standards is Healthy People 2020, which is set to expire next year. In HP 2020, under the goal to "improve the health and well-being of women, children, infants, and families," primary objectives include improving rates of ever breastfed, continued breastfed, and exclusively breastfed infants (Healthy People, 2019). While the state of Hawai`i consistently has rates that are meeting or exceeding the national goals, our rates are still lower than what the above-mentioned organizations all recommend. In 2011, 89.5% of all infants in Hawai`i had ever been breastfed, but only 61.5% were still being breastfed at six months of age, and only 26.4% were exclusively breastfed at six months (Healthy People, 2019).

It is difficult to find county-specific data on breastfeeding. The U.S. Department of Agriculture's "Special Supplemental Nutrition Program for Women, Infants, and Children," better known as WIC, provides nutritional services to low-income, at-risk pregnant, postpartum and breastfeeding women, as well as infants and children up to five years of age. These services include breastfeeding education and support, amongst many others (USDA, 2013). Every fiscal year, WIC generates a breastfeeding data report, which has data that they collect from each state, as well as individual WIC offices, in regards to breastfeeding rates of their clients. In the fiscal year 2017, the Hawaii WIC program had 703 total infants, 26.7% were fully breastfed and 17.9% partially breastfed. This means that 44.7% of the infants born, that received WIC services, were ever breastfed (USDA, 2018, pp. 68-69). The Kona WIC office had slightly better numbers, with 26.2% fully breastfed, 24.4% partially breastfed, leading to 50.5% of their 279 infants having ever breastfed (USDA, 2018, pp. 68-69). While these numbers look a bit low, compared to HP 2020 goals, and WHO and UNICEF recommendations, Tenfelde, Zielinski, and Heidarisafa (2013) found that low-income women who participated in WIC tended to have lower rates of

overall breastfeeding compared to those who did not receive WIC services, and they also stopped breastfeeding much earlier than is recommended. The CDC also found that infants receiving WIC services were less likely to ever be breastfed (CDC, 2019).

Exclusive breastfeeding

"Exclusive" breastfeeding means that an infant is receiving only breastmilk for nutrition. This can be in the form of directly latching onto the mother's breast, or expressed breastmilk via pump or surrogate, like a breastmilk bank, and fed via a bottle, syringe or cup. "Formula" refers to the artificial milk products that are made out of a variety of ingredients, including animal milk, soy milk, or other products, and are marketed and represented as a replacement or substitute for breastmilk. "Complementary feeding" is a term used to describe a child receiving both breastmilk and other foods (solid, semi-solid, or soft); as stated above, this practice is not recommended for any infant under six months of age. "Mixed feeding" is a term used to describe an infant receiving both breastmilk and any other type of food or liquid, including formula, water, or complementary foods prior to six months of age (UNICEF, 2015).

Benefits to Infants

Breastmilk contains all of the vitamins, minerals, and nutrients that an infant needs for their first six months. It is also rich in antibodies which, passed from the mother, provide immunity and protection against various acute illnesses and disease. The act of breastfeeding, alone, allows for proper growth of the mouth and jaw, and enables the appropriate secretion of hormones used for digestion. Breastfeeding causes a sense of emotional wellbeing for infants, and allows them to bond immediately with their mother (UNICEF, 2015). Breastfed infants have lower rates of infections to the respiratory tract, urinary tract, gastrointestinal tract, and late-onset sepsis. They also have lower rates of ear infections, necrotizing enterocolitis, Celiac disease, and

significantly lower incidence of sudden infant death syndrome (SIDS) (AAP, 2019; Eidelman & Schanler, 2012). Longer term benefits include decreased risk of developing chronic conditions such as obesity, diabetes, high cholesterol, high blood pressure, asthma, and certain childhood leukemias (AAP, 2019; Eidelman & Schanler, 2012; UNICEF, 2015). Breastfed infants have been shown to perform better on intelligence and behavior tests in their adulthood versus their formula-fed counterparts as well (Eidelman & Schanler, 2012; UNICEF, 2015). Any amount of breastfeeding is beneficial to an infant's life versus never being breastfed. The Surgeon General's "Call to Action" found that "the risk of sudden infant death syndrome is 56 percent higher among infants who are never breastfed" (USDHHS, 2011, p. 1). In fact, "it has been calculated that more than 900 infant lives per year may be saved in the United States if 90% of mothers exclusively breastfed for 6 months" (Eidelman & Schanler, 2012).

Benefits to Mothers

Immediate benefits to breastfeeding mothers include decreased postpartum bleeding, minimizing the risk of postpartum hemorrhage, and increased physical and emotional wellbeing, and bonding with their infant. It can also delay the return to fertility after birth by delaying the restart of menstruation, which enables well-spaced-out pregnancies, can decrease postpartum depression, and increase weight loss after delivery due to the extra calories being utilized for breastfeeding (AAP, 2019; UNICEF, 2015). Some studies have shown "an increase in postpartum depression in mothers who do not breastfeed or who wean early" (Eidelman & Schanler, 2012). In the longer term, breastfeeding has been shown to reduce a woman's rate of type 2 diabetes, breast, ovarian and uterine cancers, as well as high cholesterol, high blood pressure, and heart disease (AAP, 2019; Eidelman & Schanler, 2012; UNICEF, 2015).

Baby-Friendly Hospital Initiative

In 1991, WHO and UNICEF worked together to launch the Baby-Friendly Hospital Initiative (BFHI), in order to motivate facilities around the world to implement their Ten Steps to Successful Breastfeeding, also known as, simply, "the Ten Steps." The purpose was to increase rates of exclusive breastfeeding worldwide. Increasing breastfeeding rates will improve overall global health and infant health outcomes, especially in rural, isolated, and underdeveloped regions, by targeting facilities that provide maternity and newborn services (WHO, 2018). The Ten Steps to Successful Breastfeeding were revised and clarified in 2018, and are:

1. Comply fully with the International Code of Marketing of Breast-milk Substitutes and relevant World Health Assembly resolutions.
    - 1b. Have a written infant feeding policy that is routinely communicated to staff and parents.
    - 1c: Establish ongoing monitoring and data-management systems.
2. Ensure that staff have sufficient knowledge, competence and skills to support breastfeeding.
3. Discuss the importance and management of breastfeeding with pregnant women and their families.
4. Facilitate immediate and uninterrupted skin-to-skin contact and support mothers to initiate breastfeeding as soon as possible after birth.
5. Support mothers to initiate and maintain breastfeeding and manage common difficulties.
6. Do not provide breastfed newborns any food or fluids other than breast milk, unless medically indicated.

7. Enable mothers and their infants to remain together and to practise rooming-in 24 hours a day.
8. Support mothers to recognize and respond to their infants' cues for feeding.
9. Counsel mothers on the use and risks of feeding bottles, teats and pacifiers.
10. Coordinate discharge so that parents and their infants have timely access to ongoing support and care.

The first two steps are considered, "critical management procedures," and the other eight are referred to as, "key clinical practices" (WHO, 2019a). For the purposes of this project, we will focus on improving step 2–ensuring staff have sufficient knowledge, competence and skills to support breastfeeding–and step 3–discussing the importance and management of breastfeeding with pregnant women and their families. By improving these two steps, this project will inadvertently also address step 5–supporting mothers to initiate and maintain breastfeeding and manage common difficulties.

North Hawai`i Community Hospital

North Hawai`i Community Hospital's Family Birthing Unit obtained the Baby-Friendly Hospital designation in 2015 (Baby-Friendly, 2019), and maintains an "Infant Feeding Policy" which follows the Ten Steps. At the department level, there is online training that is provided by Baby-Friendly USA for registered nurses regarding breastfeeding education, as well as what it means to be Baby-Friendly, and what their standards are. However, there is no education routinely offered to providers; while they are given access to this same training from Baby-Friendly USA, they do not utilize it (A. McCarney, personal communication, March 15, 2019). There are also currently no courses on breastfeeding offered to patients through the hospital. Breastfeeding education is currently given by each individual provider during prenatal office

appointments. Each provider educates each patient in their own manner, without consistency or standardization. This means that breastfeeding education varies widely based on experience, education, and credentials.

The Waimea Women's Center (WWC), which is a part of North Hawai`i Community Hospital, is the primary women's health and prenatal outpatient clinic. There are multiple providers here—both obstetrics/gynecology physicians (OB MDs) and certified nurse midwives (CNMs) - that work together to deliver patients at NHCH, and WWC patients often see multiple providers during their prenatal course. There is also one family medicine physician (FM MD) who works in the outpatient primary care clinic, Hale Ola Pono (HOP), and delivers infants at NHCH. As many clients see a variety of providers for prenatal care, it is easy for them to become confused when receiving non-standardized, and sometimes conflicting, information and education regarding breastfeeding.

One OB MD stated that he did not get any training in breastfeeding while in medical school. He does tell patients that they should breastfeed because it is the best thing to do for their babies, but does not feel comfortable providing any further information or lactation education. When asked if he knew about community resources for lactation and breastfeeding, he stated that he did not (M. Villarin, personal communication, January 16, 2019). In discussion with a CNM, she reported that she received a lot of training whilst in midwifery school. However, she routinely only uses her personal experiences with feeding her own children when discussing breastfeeding with patients (J. Meister, personal communication, February 12, 2019).

Problem Statement

Recommendations from all of the international and national organizations include promoting exclusive breastfeeding for the first six months of life, with early initiation within an

hour after birth. While Hawai`i is one of the top states for breastfeeding rates, we still fall short of the Healthy People 2020 recommendations. North Hawai'i Community Hospital has obtained BFHI designation and has a policy which follows the Ten Steps; however, the education provided to patients is inconsistent and non-standardized. This means that some patients are being admitted into the facility for labor and delivery having potentially conflicting, limited, or no breastfeeding knowledge. As stated previously, up to 900 infant lives could be saved in the United States alone, by increasing the rate of exclusively breastfed infants for their first six months of life (Eidelman & Schanler, 2012). This means that the consequence of ignoring this problem is continuing to lose all of those infants' lives, plus the continued higher incidence of childhood obesity, diabetes, asthma, and the many other acute and chronic health conditions; the magnitude of this is quite staggering. The focus of this project, and a solution to this problem, is to educate the providers and furnish them with a standardized education packet that these providers will then be able to offer their prenatal patients. This standardized, evidence-based education packet on breastfeeding will improve the patients' knowledge, and increase their confidence to exclusively breastfeed their infant.

Significance to Healthcare in Hawai`i

The significance of increasing exclusive breastfeeding in Hawai`i County is an overall improvement of infant health, improvement in women's health, and decrease in morbidity and mortality, resulting in a decrease in the need for healthcare intervention. The infant mortality rate in Hawai`i County between 2013-2015 was 5.5 deaths per 1,000 births, which is lower than the national average (5.8), but higher than the overall state average (4.4) (Hawai`i Health Matters, 2019b). Knowing that exclusive breastfeeding reduces the risk of SIDS, and other significant health concerns, this number also represents 5.5 infants per 1,000 whose lives could have

possibly been saved. In 2014, in the state of Hawai`i, 10.3% of 2- to 4year-olds were considered overweight or obese; in 2017, 13.9% of 10- to 17-year-olds and 14.2% of high school students were considered overweight or obese (State of Obesity, 2017). In 2010, 10.7% of children in the state of Hawai`i had asthma, with Hawai`i County having the highest rates in the state. The largest majority of asthma-related hospitalization in the state were for children 5 years and younger, at a rate of 3.6 per 1,000 children; this is higher than the Healthy People 2020 goal of 1.8/1,000 (Hawai`i State DOH, 2012, p. 8-11). Emergency room visits related to asthma, in 2009, cost $10.4 million, and asthma-related hospitalizations in 2009 cost $24.4 million in the state of Hawai`i (Hawai`i State DOH, 2012, pp. 13). As stated previously, obesity and asthma are two significant health conditions which exclusive breastfeeding protects against (AAP, 2019; Eidelman & Schanler, 2012; UNICEF, 2015).

According to the American Cancer Society (2018), in the period of 2011-2015, for every 100,000 women in the state of Hawai`i, 136.1 were diagnosed with breast cancer, 30.1 diagnosed with uterine cancer, and 9.7 diagnosed with ovarian cancer. In 2015, Hawai`i County had the highest rates of coronary heart disease in the state; there were 53.6 deaths per 100,000 women in Hawai`i County related to heart disease (Hawai`i Health Matters, 2019a). These are all chronic and fatal health conditions whose incidence could be decreased by increasing the rates of exclusive breastfeeding in Hawai`i County (AAP, 2019; Eidelman & Schanler, 2012; UNICEF, 2015).

Needs Assessment

A needs assessment was completed to better identify and clarify each factor affecting the project, as described below. These factors include population identification, stakeholder identification, organizational assessment, assessment of available resources, desired outcomes,

and cost-benefit analysis. Rouda & Kusy (1995) stated (as cited in Zaccagnini & White, 2017, p. 454), "a needs assessment is the systematic identification of the gap between the current condition and the ideal condition." The idea for this project came by identifying the gap between the current recommendations regarding breastfeeding and breastfeeding education, and the current clinical practice in the outpatient prenatal settings.

Population Identification

The population impacted by this project, are pregnant women and their soon-to-be infants that will be delivering at North Hawai`i Community Hospital. These women are residents of the Big Island of Hawai`i, also referred to as Hawai`i County. While most of the patients are from the districts of North Hilo, Hamakua, North Kohala, South Kohala, and parts of North Kona, the Waimea Women's Center, sees and treats patients from all over the entire island.

The following data was retrieved from the U.S. Census Bureau (2018), with information as recent as 2017:

- Hawai`i County, as a whole, has a population of 196,325; 41% are females aged 15 years and older
- 2,455 women gave birth in the prior twelve months; 51.7% of these women were unmarried
- Of the total population aged 25 years and older, over 92% were high school graduates or higher education; 38.5% of this population have associate's degree or higher; 28.6% of this population have bachelor's degree or higher
- 22,125 people, or 11.3% of the total population, were listed as foreign born; 19.5% of the population speak a language other than English in the home; of these residents, 6.3% reported spoken English skills to be "less than 'very well'"

- 85% of total households have a computer, and 74.5% have broadband internet access in the home
- 92.9% of residents 16 years and older are employed
- The median household income is $56,395 and the mean household income is $73,391; 63.4% of households earn less than $75,000; 45% of households earn less than $50,000
- 12.7% of all households are living below the poverty line; 17.4% of all individual people are living below the poverty line
- 4.6% of occupied housing units have no car available, and 33.7% have only 1 car available for the household
- 94% of the non-institutionalized population have some type of health insurance; 64% have private insurance and 44% have public insurance, which includes Medicare and Medicaid (U.S. Census, 2018).

Hawai`i County has a diverse racial makeup, with 71.4% of the population identifying as a single race, and 28.6% identifying as two or more races. Of those that identify as a single race, 33.9% identify as white/Caucasian; 22.2% identify as Asian; 13.1% identify as Native Hawaiian or other Pacific Islander; 12.5% identify as Hispanic; less than 1% identify as either black/African-American or as Native American or Alaskan Native (U.S. Census, 2018).

Accurate data on the specific districts in Hawai`i County are difficult to find. However, the State of Hawai`i Data Book 2017 (2017) reports populations at the end of 2016 as follows: North Hilo population 1,676; Hamakua population 7,463; North Kohala population 6,441; South Kohala population 18,751; and North Kona population 41,662 (State of Hawai`i Data Book, 2017).

Stakeholder Identification

Stakeholders are, “individuals or groups who touch the project in some way or have an interest in the project outcome” (Moran, Burson & Conrad, 2014, p. 121). They will be affected one way or another by the project and its outcome (Zaccagnini & White, 2017). The key stakeholders for this project are the pregnant women who are planning to deliver their infants at North Hawai`i Community Hospital, and have a desire to breastfeed; obstetric and prenatal care providers whose patients deliver at NHCH (OB MD, FM MD, and CNMs); and the soon-to-be-born infants who will be breastfed. Other stakeholders include the registered nurses at NHCH Family Birthing Unit who provide in-hospital breastfeeding education and assistance; and community-based lactation counselors and consultants, as well as doulas, who provide postpartum, outpatient breastfeeding and lactation services.

On a greater level, the overall community of Hawai`i County will potentially be a part of a healthier population, with these infants and their mothers utilizing fewer healthcare resources, which leave more available to other community members; North Hawai`i Community Hospital who may see an increase in patient satisfaction scores, and can boast that they are fully in compliance with, and following, all of the BFHI Ten Steps; NHCH, and other hospitals and medical facilities in the county, who will see less infant morbidity and mortality, and whose resources can then be utilized on other, more critical patients; and insurance companies who will be able to spend less money on well babies who are exclusively breastfed, and thereby less money and resources on inpatient stays, emergency room visits, frequent outpatient visits and chronic medication costs.

Organizational Assessment

North Hawai`i Community Hospital is a 35-bed, acute-care hospital located in Kamuela, Waimea, Hawai`i, a rural community. NHCH is an affiliate of the Queen's Health Systems, and includes multiple outpatient clinics, including the Waimea Women's Center (WWC) and Hale Ola Pono (HOP). WWC in the primary women's health clinic, serving both gynecologic and obstetric patients. Currently, there are three certified nurse midwives (CNMs), two of which delivery babies, and two full-time obstetric/gynecologic physicians (OB MDs). This clinic also utilizes locum providers as needed. Most pregnant patients at NHCH are seen at WWC. HOP is the primary care clinic, and it services patients of all populations in the area. One family medicine physician (FM MD) at HOP provides prenatal and obstetric care, and delivers babies at NHCH. Amongst their numerous certifications, NHCH is designated as a Baby-Friendly Hospital by Baby-Friendly USA (North Hawai`i, n.d.).

The Family Birthing Unit (FBU) is the maternity and obstetric unit located within NHCH. FBU has five labor/delivery/recovery/postpartum (LDRP) rooms, one obstetric triage room, and three overflow postpartum rooms. There is a small nursery for sick or unstable newborns, or procedures, only. All newborns who are stable room-in with their mothers at all times. FBU is currently staffed by 14 permanent registered nurses (RNs), one per diem RN, and two secretaries/certified nursing assistants. All RNs are required to complete over 20 hours of education and training via the Baby-Friendly USA website upon hire, and are encouraged to take continuing education courses and credits in breastfeeding.

The administration of North Hawai`i Community Hospital has shown their support of breastfeeding by seeking and maintaining Baby-Friendly designation, as well as creating their Infant Feeding Policy that is based around the Ten Steps outlined previously. One staff nurse is

also designated to collect the Baby-Friendly breastfeeding data of all patients that deliver their babies at the facility. She explained that the reports represent the following eight metrics, are automatically tabulated from the electronic medical records, and tracked by Baby-Friendly USA:

1. Patients breastfeeding at some point during hospital stay (i.e. ever breastfed)
2. Immediate skin to skin contact after vaginal birth
3. Babies placed skin to skin in OR during C-section
4. Breastfed during first hour of life
5. Education documented to avoid artificial nipples and pacifiers
6. Medical indication noted to supplemented infants
7. Education documented on importance of exclusive breastfeeding for 6 months
8. Babies exclusively breastfed at discharge.

This designated RN provided the researcher with monthly data over the last twelve months (Baby Friendly Statistics, 2018-2019); however, opined that the report was negatively influenced by inconsistencies in charting of nursing notes (A. McCarney, personal communication, March 11 & 16, 2019). For example, between February 2018 and February 2019, the facility rates for ever breastfed (metric 1) were between 92-100%. The rates of infants who had ever had their feedings supplemented with formula at any point during their hospital stay were 10-30%, however, only 0-78% of these had the appropriate documentation stating a medical indication for formula supplementation (metric 6). The rates for immediate skin-to-skin after a vaginal delivery were 70-89%, and skin-to-skin during a C-section 17-100% (metrics 2 and 3). The rates of infants breastfed within one hour of birth were 26-63% (metric 4). The documented rates for infants exclusively breastfed at discharge during the past year were 22-55% (metric 8) (Baby Friendly Statistics, 2018-2019).

Anecdotally, both researcher and RN suspect these numbers to be falsely low based on direct observations of the nursing staff in the FBU setting. Nurses on the unit were consistently observed providing breastfeeding education and assistance, as well as Baby-Friendly education, such as avoiding artificial nipples and formula (unless medically indicated), and discussions regarding exclusive breastfeeding. In short, it appeared that these nurses were following the facility policy and Ten Steps, but inconsistently documenting as such. This is evidenced by the rates for education provided on avoiding artificial nipples and pacifiers (metric 5) and importance of exclusively breastfeeding for six months (metric 7) being only 11-51% (Baby Friendly Statistics, 2018-2019). A. McCarney asserted that the charting that is automatically pulled to create the data is not user-friendly (personal communication, March 16, 2019). She reiterated that items such as time of first skin-to-skin and the first breastfeeding session must be documented in the delivery summary, which is often already signed by the time the nurse is able to chart. They can create an addendum, but many simply chart these on the regular newborn flowsheet instead, because it is easier. Similarly, on discharge, the nurse MUST find the "baby-friendly" tab in the electronic medical record to click 'yes or no' as to whether the infant was exclusively breastfed on discharge, and this is often forgotten, as it is an extra tab to open during discharge (A. McCarney, personal communication, March 11 & 16, 2019).

Assessment of Available Resources

The largest available resource that is provided is the Baby-Friendly training that is mandatory for all incoming FBU RNs, which is paid for by the facility. This education is provided by FirstLatch.net, which is the Baby-Friendly Hospital Initiative training website (First Latch, 2019). The providers are also encouraged to partake in this training, however, they do not. The internet is available on most facility computers, making it easy to search for further

resources and education. The organization also encourages continuing education in areas of specialty for all nurses.

Resources in the community are relatively sparse. Similar communities, with similar demographics, across the United States have access to WIC. As stated previously, WIC provides nutritional services to low-income, at-risk pregnant, postpartum and breastfeeding women, as well as infants and children up to five years of age, including breastfeeding education and support (USDA, 2013). Unfortunately, there is no official WIC office in this part of the island. The Hilo-based WIC office is over 55 miles from NHCH, and the Kona-based WIC office is about 50 miles away; and many patients live over 70 miles away from these WIC offices (Google Maps, n.d.-a,b,c &d). Some staff from the Hilo WIC office go into Waimea weekly and provide some services at the Waimea Civic Center (Hawai`i State DOH, n.d.). The majority of people queried by the researcher did not know that there was any WIC presence on this part of the island.

Likewise, there are very limited resources in the community regarding breastfeeding education. NHCH does not have a prenatal or breastfeeding course. The two other birthing facilities on the island, located at Hilo Medical Center and Kona Community Hospital, have prenatal and breastfeeding courses. Unfortunately, these facilities are both over 40 miles away from Waimea, and the courses are given over multiple days, and have a cost. There is a Hui Malama Ola Na ‘Oiwi Healthy Hapai program that offers free, island-wide prenatal education, with an “intro to breastfeeding” as a part of the second session of the five-session course (Hui Malama, 2019). This Healthy Hapai program “travels” to different parts of the island, but there is no guarantee that it will be held in a convenient part of the island when a given patient is interested in taking the course, especially with a five-week commitment. There are other

community-based educators, lactation consultants, and doulas that offer classes and support, all at a cost, and all require travel time.

Desired and Expected Outcomes

The primary desired outcome of this project was for obstetric patients of NHCH to have increased confidence and preparedness to exclusively breastfeed their infants, via education and support provided to them in the prenatal period. Additionally, it was expected for obstetric providers servicing NHCH to have an increased awareness of the benefits of breastfeeding, and the confidence to educate their prenatal patients on basic breastfeeding topics, in accordance with the Ten Steps. It was therefore expected that there would be a statistically significant difference in pre- and posttest scores for both provider and patient participant groups. See chapter 3 for further information regarding this project's methodology and data analysis.

Cost-Benefit Analysis

The most obvious cost benefit of exclusive breastfeeding it that it is free. Breastmilk is free food that a mother's body produces, in order to feed her child the exact nutrients that they need at that specific time. However, there is a large cost saving as well when the health benefits are evaluated. For example, it has been estimated that, "if 90 percent of U.S. families followed guidelines to breastfeed exclusively for six months, the United States would save $13 billion annually from reduced direct medical and indirect costs and the cost of premature death. If 80 percent of U.S. families complied, $10.5 billion per year would be saved" (USDHHS, 2011, p. 3). The Centers for Disease Control and Prevention (CDC) (2019) found that over $3 billion per year in medical costs for both mothers and children in the U.S. can be attributed to low breastfeeding rates.

Assumptions

At the onset of this project, a number of basic assumptions are made. They include:

- Mothers want what is best for their child
- Most parents trust that their healthcare providers want what is best for them
- Breastfeeding is the best way to feed your infant
- Some mothers do not understand all of the benefits of breastfeeding and risks of formula or mixed feedings
- Some mothers do not know the most common breastfeeding positions and how to obtain a proper latch before delivering their infant
- Consistent and standardized education can better empower new mothers to exclusively breastfeed their infant
- North Hawai`i Community Hospital is committed to providing high quality and safe care
- North Hawai`i Community Hospital wants its new mothers and babies to be safe, healthy, and well-informed
- The obstetric and prenatal care providers that deliver at NHCH want what is best and safest for their patients
- The obstetric and prenatal care providers that deliver at NHCH have varying levels of education regarding breastfeeding, and therefore provide inconsistent teaching to patients.

Project Goal

The overall goal of this project was to increase exclusive breastfeeding rates by increasing and improving breastfeeding education provided to prenatal patients in their third trimester, who are planning to deliver their babies at NHCH's Family Birthing Unit (FBU).

Below are the specific aims of this project, with objectives regarding how they were to be attained:

Aims and Objectives

Specific Aim 1: Create a standardized, evidence-based breastfeeding education packet to give to prenatal patients in their third trimester (27 weeks through the end of their pregnancy).

Objective 1*:* Compile educational topics and images that are evidence-based and widely accepted, and currently being used by respected organizations to promote breastfeeding education and awareness.

Specific Aim 2: Increase the knowledge of obstetric and prenatal providers regarding basic breastfeeding information which can be shared with patients, as well as the FBU's Infant Feeding Policy, current WHO recommendation for infant nutrition, and Baby-Friendly Hospital Initiative.

Objective 1: Provide education to the providers describing current WHO recommendations for infant nutrition, information on the Baby-Friendly Hospital Initiative, and the Family Birthing Unit's current infant feeding policy.

Objective 2: Provide education regarding the benefits of breastfeeding to both mothers and infants, and basic breastfeeding knowledge, including proper latch technique and breastfeeding positions. Present and discuss the packet mentioned in Aim #1.

Objective 3: Administer a pre- and posttest to the obstetric and prenatal providers whose patients deliver at NHCH FBU, to assess their knowledge of the above topics, both before and after the educational session, and evaluate the materials.

Specific Aim 3: Improve accessibility to, and increase, education and culturally appropriate breastfeeding resources for prenatal patients.

Objective 1: Meet with patients, on a free and voluntary basis, before or after their prenatal appointment, at WWC and/or HOP clinics, to perform breastfeeding education using the standardized education packet.

Objective 2: Administer a pre- and posttest to these participating prenatal patients to determine their knowledge of basic breastfeeding information prior to the session, and to assess the effectiveness of the teaching material.

Summary

In this chapter, recommendations regarding exclusive breastfeeding from both national and international organizations were described. Important concepts were defined, such as exclusive breastfeeding, formula, complementary feeding, and mixed feedings. County-specific data were collected and presented, and compared to national data and benchmarks, and the significance to healthcare in Hawai`i was discussed. A needs assessment was completed to assist in identifying the gap between the recommendations and current practice. Assumptions regarding breastfeeding and breastfeeding education were presented, and the project's goal, aims, and objectives were described. In chapter II, the guiding theoretical framework will be presented, as well as a comprehensive review of supporting literature.

CHAPTER II:

THEORETICAL FRAMEWORK AND REVIEW OF LITERATURE

In chapter II, the theoretical framework used to influence and guide this Practice Inquiry Project (PIP) will be presented. It will be followed by a comprehensive review of literature related to maternal perceptions, societal norms, and barriers and disparities in breastfeeding. There will also be literature presented that discusses benefits of Baby-Friendly designated hospitals, provider type and breastfeeding, and effects of prenatal breastfeeding education.

Theoretical Framework

The theoretical framework used to guide this project was the Levels of Prevention Model (LOP), which is a model of prevention first presented by Leavell and Clark in 1975 (Current, 2012). LOP describes three main levels of target populations and interventions as a way to prevent or manage disease processes–primary, secondary, and tertiary prevention. Because this was a quality improvement project with a focus on primary prevention, the LOP model was an ideal framework. Primary prevention focuses on preventing illness and disease before it starts, sometimes by targeting those deemed at-risk, via health promotion and health education (Pandve, 2014).

Primary prevention can be described as taking actions within the targeted population, to decrease the possibility of disease from occurring (Current, 2012). For example, all newborn infants are at risk for developing any number of acute or chronic health conditions, as outlined in chapter I. By providing health education to mothers, starting in the prenatal period, it is anticipated there will be an increase in the rate of exclusive breastfeeding, thereby reducing the incidence of these illnesses. Secondary prevention focuses on early detection of illness, or intervening while a patient is still asymptomatic of an adverse disease process. Tertiary

prevention has a focus on treating the illness once it has begun (Pandve, 2014). The LOP model is frequently pictured as a pyramid, with primary prevention being the base, the largest segment, as it reaches the most people and is the foundation for all further levels of prevention. Secondary and tertiary prevention strategies are more focused, and reach and increasingly narrowing segment of the population (Figure 1).

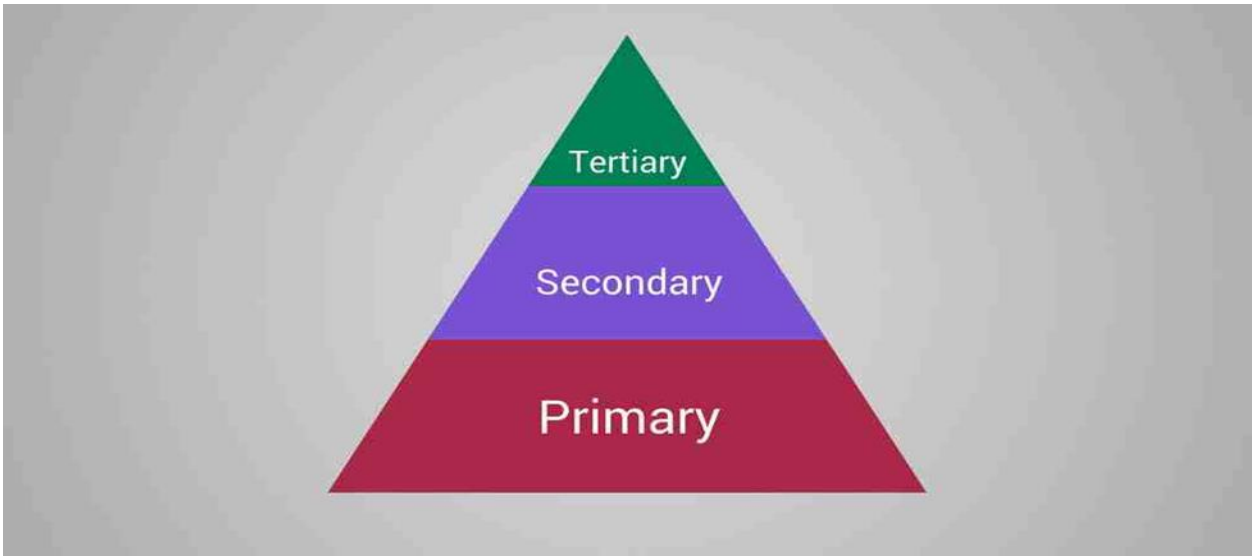


Figure 1: Leavell and Clark's Three Levels of Prevention.
From: RNpedia. (2019). Leavell and Clark's three levels of prevention. Retrieved from https://www.rnpedia.com/nursing-notes/fundamentals-in-nursing-notes/leavell-clarks-three-levels-prevention/

Some sources describe a fourth level of prevention–primordial prevention–which comes before primary prevention on the continuum (Figure 2). Primordial prevention addresses general health determinants within the entire population to prevent risk factors from occurring in the first place (Current, 2012; Pandve, 2014). WHO and UNICEF have taken steps toward primordial prevention by publishing their recommendations for exclusive breastfeeding for all infants, which would reduce their individual risk of many adverse health conditions from ever developing, as well as improving overall community and global health.

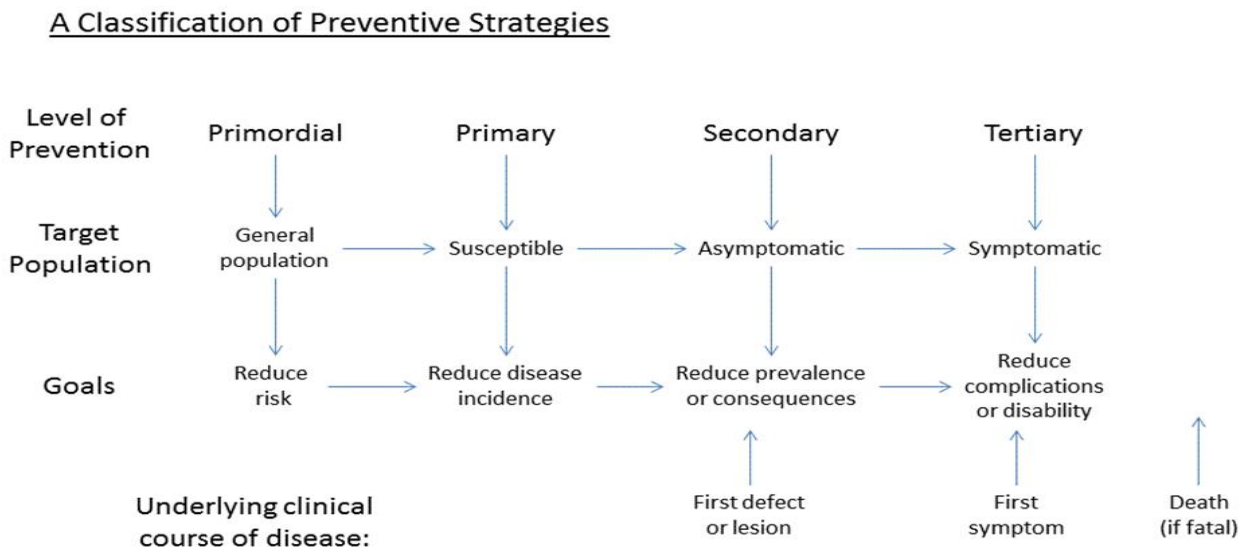


Figure 2: A Classification of Prevention Strategies.
From: University of Ottawa. (January, 2015). Categories of prevention. Retrieved from https://www.med.uottawa.ca/sim/data/Prevention_e.htm

The Levels of Prevention model is widely used and accepted as a basis of health promotion. National and international organizations such as WHO, UNICEF, and the CDC base their educational materials, including those related to breastfeeding, on primary prevention, (CDC 2019; UNICEF, 2015; WHO, 2019b). Professional organizations, such as the American Academy of Pediatrics (AAP) and National Association of Pediatric Nurse Practitioners (NAPNAP), have written statements and recommendations centered around the importance of primary prevention, specifically breastfeeding as primary prevention, as the most important step toward improving health (Busch, Silbert-Flagg, Ryngaert & Scott, 2018; Eidelman & Schanler, 2012). A multitude of studies have discussed a variety of health education, health promotion, and other forms of primary prevention as supremely important in personal, community, and global health, including breastfeeding and breastfeeding education as primary prevention (Gabida et al., 2015; Lange, Nautsch, Weitmann, Ittermann & Heckmann, 2017; Leruth, Goodman, Bragg &

Gray, 2017; Lu et al., 2003; Perrine et al., 2015; Ruffin & Renaud, 2015; Zakaria-Grkovic et al., 2016). Pandve (2014) wrote:

> "Prevention is better than cure" or "an ounce of prevention worth a pound of cure." Both these sayings are undoubtedly true. Research underlines that prevention is necessary. Through high-quality prevention, we can create community environments that foster good health. Prevention is our best hope for reducing unnecessary demand on the healthcare system (Pandve, 2014).

Review of Literature

A thorough literature review was conducted to aid in support for this project. Academic-based search engines, such as CINAHL, MedLine, PubMed and Academic Search Complete–all with access via EBSCO–were used to find evidence-based research and studies, locally and from around the globe. Sources such as Baby-Friendly USA, the National Institute of Health, and national and international government agencies, such as the CDC, WHO and UNICEF were also searched and utilized. The literature review, presented below, is organized into four general topics: maternal perception, societal norms, and barriers and disparities in breastfeeding; Baby-Friendly Hospital Initiative benefits; provider type and breastfeeding; and effects of prenatal breastfeeding education.

Maternal Perception, Societal Norms, and Disparities and Barriers

The benefits of exclusive breastfeeding have been described previously, in chapter I. It is therefore important to discuss the most common reasons why women choose not to exclusively breastfeed from the beginning, stop exclusivity early to begin mixed feedings, or stop breastfeeding completely before the aforementioned recommended duration is up.

Maternal perception. Many studies have shown that a mother's initial perceptions can, and do, affect their initiation and duration of breastfeeding. In the United Kingdom, it was found that many women are ill-informed about breastfeeding, prenatally, which caused them to get frustrated by obstacles and stop breastfeeding much earlier than recommended (Spencer, Greatrex-White & Fraser, 2014). These researchers found that women were told that breastfeeding was the best thing to do for their infant, and that breastfeeding was completely natural, which many women interpreted as it being an innate ability. Three themes emerged from their research–idealized expectations from media and friends and family, a feeling of being trapped in the situation via constant demands for feedings, and a burden of responsibility of being alone once home, and being the only one able to feed their child. The combinations of these, mixed with some effects of poor latch technique, such as cracked nipples, pain or bleeding, led many of the participants to blame themselves, or the mode of feeding (i.e. breastfeeding, versus formula) and feel like failures (Spencer, et al., 2014).

Nnebe-Agumadu, Racine, Laditka and Coffman (2016) found that women who were well-informed prenatally and had a strong desire and intention to exclusively breastfeed, were more than twice as likely to exclusively breastfeed their child for at least three months. Additionally, these researchers found that prenatal education, and continued lactation support postpartum, helped these women feel confident in continuing to exclusively breastfeed (Nnebe-Agumadu, et al., 2016). Lange et al. (2017) also found that a strong prenatal intent and motivation to breastfeed was positively associated with breastfeeding duration, and that this motivation was enhanced with prenatal education.

Adolescent-aged new mothers were found to have lower rates of both initiation of breastfeeding, and exclusive breastfeeding, when compared to women of other age groups

(Nuampa, Tilokskulchai, Sinsuksai, Patil & Phahuwatanakorn, 2018). In their Thai study, these researchers explained that adolescents, even though they are becoming mothers, are still in the stage of developing their own self-image and identity, and still have an immature, adolescent brain. While the participants acknowledged their understanding that breastmilk is best for their baby, and they appreciated the cost savings when compared with formula, the participants also struggled with the loss of freedom and control of their bodies. Most of them also had issues involving improper latch technique, such as nipple pain or cracked nipples. Female family members seemed to be one of the biggest sources of how the participants themselves perceived breastfeeding; i.e. if their relative spoke highly of the benefits, they would continue trying to breastfeed despite the obstacles, however, if a relative promoted formula or other foods, the participant was more likely to stop exclusively breastfeeding, or even stop breastfeeding altogether (Nuampa, et al., 2018).

A Mexican study found that many mothers believed that breastmilk is not nutritious after six months (Swigart, et al., 2017). A study in India showed that many women think that babies over six months were too old to be exclusively breastfed (Nishimura, et. al., 2018). These studies and others have found that many women all over the world simply do not believe that they make enough milk, leading some to develop anxiety over this, which leads them to feed or supplement with formula or other substitutes earlier than recommended (Safon, et. al., 2017).

Societal norms. Identifying breastfeeding as a societal norm also has a large impact on maternal perceptions and continued breastfeeding. Nuampa, et al., (2018) found that over half of their participants were embarrassed to breastfeed in public, and felt that bottle feeding was more socially acceptable. A study in Mexico found that societal norms played a significant part in exclusive breastfeeding (Swigart, et al., 2017). While breastfeeding, in general, was highly

regarded, the cultural belief was that breastmilk alone is not sufficient for a baby up to six months old, and the mother should supplement with formula or water. Breastfeeding in public and breastfeeding after the baby started growing teeth was also frowned upon (Swigart, et al., 2017). Safon et. al. (2017) found that women in Nicaragua frequently either did not exclusively breastfed at all, or stopped early to give formula because they believed formula to be essential to an infant's diet, due to the ease and abundance in which it is found.

Dunn, Kalich, Henning, and Fedrizzi (2015) also found that many women in the United States do not consider public breastfeeding to be a societal norm, and feel embarrassed. Many of the women in this study also found the ease and availability of formula to depict that formula is equal or similar enough to breastmilk (Dunn, et. al., 2015). Danawi, Estrada, Hasbini, and Wilson (2016) found that cultural norms have sexualized breasts so much in the U.S. that many women feel that public breastfeeding is parallel to indecent exposure. Thomson, Ebisch-Burton, and Flacking (2015) found that women often feel shame regardless of how they choose to feed their child. Those who choose to bottle or formula feed may feel guilt, shame, or feelings of being a bad mother. Those who choose to breastfeed often feel shame or embarrassment when feeding their child in public, and some even feel sexualized (Thomson, et. al., 2015). Many of these women feel uneasy about seeking help or further support, which can add to their feelings of insecurity (Thomson, et. al., 2015).

Barriers and disparities in breastfeeding. Nipple trauma is one of the most common barriers encountered with breastfeeding, especially when due to improper breastfeeding technique. Types of trauma can include cracked, bleeding, or blistered nipples, or severe nipple pain (da Silva Santos, et. al., 2016). Nipple trauma, very often, results in an interruption or stoppage of exclusive breastfeeding, with up to 35% of women stopping or interrupting

breastfeeding within the first month postpartum (da Silva Santos, et. al., 2016). Poor breastfeeding technique was identified as the number one cause of cracked nipples. Breast engorgement and the use of a bottle were the next most common factors, as both can cause a change in latch and sucking techniques (da Silva Santos, et. al., 2016). These can all be corrected, especially poor technique, by providing standardized education to patients.

Breastfeeding is one area of healthcare where there is a documented racial disparity. African-American women have been found to receive insufficient support and encouragement to breastfeed, which leads to overall lower breastfeeding rates in the African-American community (Thrower & Peoples, 2015). The CDC (2019) found that black infants are less likely to be breastfed than white and Hispanic infants. Danawi, et. al., (2016) also reported significantly lower rates of ever breastfed and continued breastfeeding at six months, in African-American children, compared to white children in the United States. Thomson, Tussing-Humphreys, Goodman, Landry, and Olender (2017) found that, despite knowledge of general benefits of breastfeeding and an initial desire to breastfeed their infants, African-American women in Mississippi still had unfortunately low rates of breastfeeding, and especially exclusive breastfeeding.

In a meta-analysis, less than half of Native Hawaiian/Pacific Islander women were found to initiate breastfeeding or exclusively breastfeed (Adams, et. al., 2016). Native Hawaiian women were shown to have significantly lower rates of exclusive breastfeeding at both three and six months when compared to their white, black, Korean, Japanese, Chinese, Filipino, and Samoan counterparts (Adams, et al., 2016). An Australian study found that Vietnamese women were less likely to breastfeed their infants (Arora, et. al., 2017).

Multiple studies have also shown that a higher maternal education is associated with higher rates of breastfeeding (Arora, et. al., 2017; Lange, et. al., 2017; Lenja, Demissie, Yohannes & Yohannis, 2016; Nishimura, et. al., 2018; Nnebe-Agumadu, et. al., 2016; Pitonyak, Jessop, Pontiggia & Crivelli-Kovach, 2016). In fact, Pitonyak, et. al. (2016) found that college graduates were twice as likely to exclusively breastfeed their infant for four months or longer, compared to their less educated counterparts.

Whipps (2016) explained that many studies argue that age is a factor in breastfeeding duration, i.e. older mothers breastfeed longer than their younger or adolescent counterparts. However, this author found that maternal education and parity are the predominant factors, and both of these happen to be associated with an older maternal age. It was observed that while maternal education level was a higher predictor of breastfeeding duration, parity is also statistically significant. Multiparous women (those who have had more than one child) had higher rates of both initiation and duration of breastfeeding, and exclusive breastfeeding, than their primiparous counterparts (those having their first child) (Whipps, 2016). While this author could not identify the specific reason(s) why, she suggests it may be due to more comfort with the act of breastfeeding, greater ease in initial milk production, or more appreciation for the cost savings (Whipps, 2016).

The Baby-Friendly Hospital Initiative Benefits

To become a designated Baby-Friendly Hospital, the facility must adhere to the Ten Steps described in chapter I, and, “adhere to the Code of Marketing of Breastmilk Substitutes” (Spaeth, Zemp, Merten & Dratva, 2018, p.1). This ‘Code’ essentially states that these participating countries, organizations, and facilities will not advertise or aggressively market formula or other breastmilk substitutes, especially in any way that will interfere with

breastfeeding, and they will promote breastfeeding as the foremost and best way to nourish an infant (WHO, 1981). Babies born in Baby-Friendly designated facilities have been shown to exclusively breastfeed more often in the hospital setting, and continue to be breastfed longer, than babies born in non-Baby-Friendly facilities (Spaeth, et. al., 2018). In another study, Yilmaz, et. al. (2017) found that, despite the numbers not reaching the ultimate goal, babies born in a Baby-Friendly hospital had a sooner initial breastfeed, and were exclusively breastfed longer than the average.

A Japanese study found that babies born in their Baby-Friendly hospitals were significantly more likely, than the national average, to be exclusively breastfed at discharge, and be still exclusively breastfed at one month (Yoda, Takahashi & Yamauchi, 2013). Otsuka et. al. (2014) gave women of both Baby-Friendly and non-Baby-Friendly hospitals self-efficacy breastfeeding workbooks. Those women who delivered at Baby-Friendly hospitals were found to have higher rates of continued exclusive breastfeeding through four weeks, versus those who delivered at non-Baby-Friendly hospitals, with the same intervention (Otsuka, et. al., 2014). Bærug, et. al. (2016) even found that implementing Baby-Friendly principles into community health services increased the rates of exclusive breastfeeding through six months.

Provider Type and Breastfeeding

There have been some studies that show a relationship between provider type (i.e. physician, midwife, etc.) and patients' breastfeeding beliefs, intents, and durations. Balyakina, Fulda, Franks, Cardarelli, and Hinkle (2016) found that most patients make their decisions regarding breastfeeding during the antenatal period, and that the type of provider they see can make a difference in their choices. These authors believe that a woman's intent to breastfeed is a major predictor of their initiation and duration of exclusive breastfeeding. In their study, patients

who solely saw a midwife for prenatal care were more than twice as likely to have a strong intent to breastfeed, versus those seen by either OB physicians or general practitioners. The authors cited that many prenatal care settings do not openly promote breastfeeding. It was found that 64% of certified nurse midwives considered themselves strong breastfeeding advocates, compared to 13% of family practice physicians, and only 7% of OB physicians (Balyakina, et al., 2016).

Wallenborn and Masho (2018) examined provider type and breastfeeding duration. These researchers reported that breastfeeding education and support provided to patients varies depending on which type of provider they are seeing. They found that those with a CNM or FM MD were twice as likely to breastfeed for at least six months when compared to OB MDs. Additionally, those patients with a midwife were six times more likely to breastfeed their infant for at least six months, compared to an OB physician (Wallenborn & Masho, 2018). These researchers stated that interventions are needed to break down the barriers dividing the care provided by the different types of providers, in order for women to get consistent and standardized breastfeeding education and support (Wallenborn & Masho, 2018).

Nnebe-Agumadu, et al. (2016) reported that the practice of multiple providers giving varied education to patients leads to misinformation which can significantly affect breastfeeding intention, and therefore, initiation and duration. Younger mothers were found to feel confused, and even manipulated, by different views and recommendations given to them by different providers, which can lead to skepticism and a decision against exclusive breastfeeding (Lange, et al., 2017). Swigart, et al., (2017) found that healthcare provider advice was considered highly influential, however contradictory or false information given by varied providers often caused women to engage in unsafe or non-recommended feeding practices (Swigart, et.al., 2017).

Thrower and Peoples (2015) also found that prenatal breastfeeding education tends to be inconsistent and sporadic, and not meeting the needs of the expectant mother, which affects their breastfeeding initiation and duration (Thrower & Peoples, 2015).

Effects of Prenatal Breastfeeding Education

Many women feel that they receive inadequate and misleading education on breastfeeding prenatally, as well as postpartum, and sometimes feel they are getting mixed messages in regards to breastfeeding (Edwards, Bickmore, Jenkins, Foley & Manjourides, 2013). Many studies have shown that comprehensive antenatal breastfeeding education is a significant predictor, and in some cases the most important, of both exclusive breastfeeding initiation and duration (Danawi, et. al., 2016; Nishimura, et. al., 2018; Nnebe-Agumadu, et. al., 2016; Nuampa, et. al., 2018; Thrower & Peoples, 2015; Yilmaz, et. al., 2017). Nnebe-Agumadu, et. al. (2016) cite the CDC suggestion that, "education about breastfeeding is the most effective single intervention to increase breastfeeding initiation and short-term duration" (Nnebe-Agumadu, et. al., 2016, p. 6). Mizrak, Ozerdogan, and Colak (2017) found that women who received focused prenatal breastfeeding education had increased self-efficacy and success, and much higher rates of exclusive breastfeeding at one and eight weeks postpartum. A Healthy Start educational program targeting low-income, African-American women in the Chicago area delivered breastfeeding education from pregnancy, through the prenatal period, until six months postpartum. These researchers found a significant increase in breastfeeding initiation in this population (Leruth, et. al., 2017).

A number of studies have been published showing the benefits of prenatal breastfeeding education in a group setting. One such study found that women who had group prenatal education demonstrated higher levels of health literacy and self-care, and initiated breastfeeding

sooner. They were also able to confidently explain the benefits of exclusive breastfeeding for six months (Lori, Ofosu-Darkwah, Boyd, Banerjee & Adanu, 2017). One group model is CenteringPregnancy, which has a strong focus on education, as well as social support (Chae, Chae, Kandula & Winter, 2017). Studies vary on whether or not this model is more effective on breastfeeding versus individual prenatal education, however, all agree that prenatal breastfeeding education, as a whole, leads to increased rates of breastfeeding initiation, duration, and exclusivity (Chae, et. al., 2017). A study on women in Massachusetts receiving WIC services, showed that those who took part in prenatal breastfeeding education were significantly more likely to initiate breastfeeding, and to breastfeed for a longer duration, than those who only received postpartum breastfeeding education (Metallinos-Katsaras, Brown & Colchamiro, 2015). This study also showed that the earlier the women began receiving education, i.e. first trimester versus third trimester, the higher the rates were of continued breastfeeding at three, six and twelve months (Metallinos-Katsaras, et. al., 2015).

An Australian study described a prenatal breastfeeding education program that was failing due to poor design, which led to women feeling dissatisfied and eventually dropping out (Stockdale, Sinclair & Kernohan, 2014). When the course was restructured using the ARCs Model, participants reported higher rates of maternal satisfaction and confidence with breastfeeding (Stockdale, Sinclair & Kernohan, 2014). This study demonstrates the importance of appropriate, relevant, and motivational education. Similarly, Charlick, McKellar, Fiedler, and Pincombe (2015) stress the importance of providing individualized education, utilizing interpretive phenomenological analysis. These researchers argue that prenatal educational programs based on findings from this type of study would help to increase the rate and duration of exclusive breastfeeding (Charlick, et. al., 2015). Peer counseling programs have also been

proven to improve breastfeeding outcomes, especially in low-income populations (Rozga, Benton, Kerver & Olson, 2016).

Summary

The review of literature provided overwhelming support for this PIP. The reviewed studies showed that by evaluating maternal perception and challenging societal norms, as well as addressing common barriers and disparities in breastfeeding, education can play a significant role in increasing the rates of exclusive breastfeeding initiation and duration. The research also showed how beneficial Baby-Friendly practices are in both inpatient and community-based settings. The literature provided data on how each type of provider may routinely be giving different or conflicting education to patients, and that this can lead to confusion and non-recommended infant feeding practices. Finally, the literature provided many examples of how appropriate prenatal education–whether it is delivered individually, in a group, or via peer counselor–significantly increases rates of breastfeeding initiation and duration.

This chapter also pictured and described the theoretical model used to guide this PIP. Health promotion and health education are two core components of primary prevention and provide much of the base for any further prevention strategies. Education as primary prevention does have a great impact on individual, community, and global health. Chapter III will present the project design and methodology that was used for data collection and analysis, as well as how the data were evaluated.

CHAPTER III:

PROJECT DESIGN AND EVALUATION PLAN

In chapter III, the project design will be presented, beginning with the guiding quality improvement project model. Methodology for each of the aforementioned specific aims and objectives will be discussed, including tools and methods for data collection, analysis, and evaluation. This chapter will also address ethical considerations and human subject protections provided during this project.

Project Design

This Practice Inquiry Project (PIP) is a quality improvement (QI) project. Quality improvement has been described as "systematic and continuous actions that lead to measurable improvement in health care services and the health status of targeted patient groups" (HRSA, 2011, p. 1). Quality improvement projects tend to focus on patients, teamwork, and the use of data as a way to improve current systems and processes (HRSA, 2011). The goals of quality improvement projects include improving the delivery of health services, reducing the costs of quality care, and improving the health of the population (Zaccagnini & White, 2017).

FADE Model

The methodology for this PIP was guided by the FADE QI model, which stands for Focus-Analyze-Develop-Execute/Evaluate (Figure 3). This is a cyclic model, which may potentially continue on as adjustments and revisions are made, in order to reach the ultimate goal (HRSA, 2011). This project was done in two phases. The first phase was the project proposal, which addressed the first half of this model. This project and final manuscript represent the second phase, and addresses the second half of the model. This is further described below as:

- Focus: define process to be improved: A gap in standardized and consistent prenatal education was discovered. This was found by, primarily, personal knowledge and observation, as well as personal communications with coworkers, providers and patients.
- Analyze: collect and analyze data: For the project proposal, research was conducted about Baby-Friendly principles and practices, and BFHI designation. Data were obtained regarding county-specific demographics and breastfeeding rates. Preliminary, informal interviews were conducted with multiple prenatal providers, as well as the RN designated to track facility Baby-Friendly data. The needs assessment and review of literature provided support for the baseline data and potential influencing factors.
- Develop: develop action plans for improvement: A prenatal breastfeeding education packet was developed for this project. An educational session was planned for the prenatal providers, and logistics were sorted for this provider session, as well as sessions with prenatal patients. Instruments and tools were also developed to aid in data collection and analysis.
- Execute: implement the action plans: One educational session was held with the prenatal providers, and two days of educational sessions were provided to patients. As outlined below in “methodology” each group was presented with educational materials, as well as a pre- and posttest to assess knowledge before and after the education was given. Demographic data were also collected from each group of participants.
- Evaluate: measure and monitor outcomes for success: The pre- and posttests were analyzed and resulting data evaluated. Demographic data were compiled and compared to assess for any themes. Limitations were identified as part of the project evaluation,

and could be used to possibly make revisions and re-execute at a later date. For further details, continue below for the methodology, and on through the rest of this manuscript.

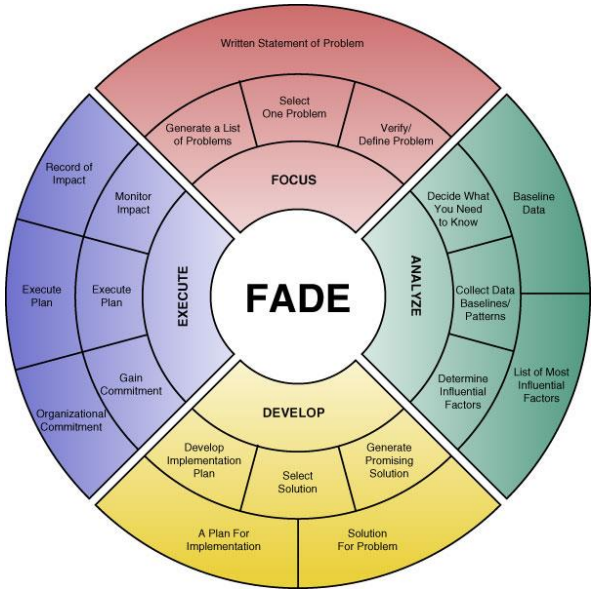


Figure 3: FADE Model.

From: Wiseman, B. & Kaprielian, V.S. (2019). Methods of quality improvement: FADE. Duke University. Retrieved from http://josieking.org/patient-safety-quality-improvement-modules/

Methodology

Following the FADE QI model, each specific aim, and its objectives, was executed, as outlined below. As alluded to above, the focus (F) and analysis (A) of this PIP were addressed in the project proposal. The methodology of the development (D), execution (E) and evaluation (E) of each aim is described below:

Specific Aim 1: Create a standardized, evidence-based breastfeeding education packet to give to prenatal patients in their third trimester (27 weeks through the end of their pregnancy)

Objective 1: Compile educational topics and images that are evidence-based and widely accepted, and currently being used by respected organizations to promote breastfeeding education and awareness.

D (Develop): A prenatal breastfeeding education packet was developed from existing data and images currently being used for prenatal breastfeeding education. This information was obtained from Lactation Education Resources, which is the lactation education affiliate of FirstLatch.net, and provides approved education for staff and parents regarding Baby-Friendly information and practices (First Latch, 2019). The researcher adapted some of the teaching handouts from this site in order to choose photos and content that were most relevant to the content I wanted included in the packet. These images and handouts on the website are provided and free to use for educational purposes; see Appendix B for permission statements. A simple welcome letter was also included as the first page of the packet, and includes a short introduction to Baby-Friendly practice, and thanks the patients for choosing North Hawai`i Community Hospital (Appendix L).

E (Execute): The execution took place twice. First, an educational session was held with providers, and this packet was presented to them at that time (see Specific Aim 2, below). The second execution took place over two consecutive days outside of the Waimea Women's Center, where the packet was presented to patients in multiple, small, individual educational sessions (see Specific Aim 3, below).

E (Evaluate): The content and value of this packet was evaluated by analyzing pre- and posttest data that was collected by participants from both the provider group and the patient group. See Specific Aims 2 and 3 below for further details.

Specific Aim 2: Increase the knowledge of obstetric and prenatal providers regarding basic breastfeeding information which can be shared with patients, as well as the FBU's Infant Feeding Policy, current WHO recommendation for infant nutrition, and Baby-Friendly Hospital Initiative.

***Objective 1*:** Provide education to the providers describing current WHO recommendations for infant nutrition, information on the Baby-Friendly Hospital Initiative, and the Family Birthing Unit's current infant feeding policy.

Objective 2: Provide education regarding the benefits of breastfeeding to both mothers and infants, and basic breastfeeding knowledge, including proper latch technique and breastfeeding positions. Present and discuss the packet mentioned in Specific Aim 1.

Objective 3: Administer a pre- and posttest to the obstetric and prenatal providers whose patients deliver at NHCH FBU, to assess their knowledge of the above topics, both before and after the educational session, and to evaluate the materials.

D (Develop): An educational session was developed for the prenatal care providers who participated in this project. The session addressed both Objectives 1 and 2. It consisted of a PowerPoint presentation, along with slide and note handouts, including information gathered as part of the project proposal. Information presented included that on WHO recommendations, as well as recommendations from professional national organizations, Baby-Friendly Hospital Initiative and the Family Birthing Unit's infant feeding policy. Important and relevant statistics were included, such as patient population demographics and census data, as well as current resources available on island. The educational session also included a discussion regarding basic breastfeeding knowledge and how to educate patients regarding breastfeeding; the packet designed in Specific Aim 1 was presented to participants at this time. The educational session utilized audio, visual, written and verbal education, along with group discussion. A pre- and posttest was designed for these participants, as well as a demographics questionnaire.

E (Execute): The educational session described above was executed on June 4, 2019, after clinic hours, from 5:30 to 7:30 pm. With approval from North Hawai`i Community Hospital

administration, a small conference room was made available for our use. A light, healthy dinner was provided to the provider participants. The written handouts were distributed, and PowerPoint presentation given, followed by review of the educational packet and group discussion. Participants were all given a consent handout, anonymous demographic questionnaire, and pretest prior to the session, and given a posttest at the end (See instrument section below).

E (Evaluate): Evaluation addressed Objective 3, and consisted of analyzing the data collected in the pre- and posttests, to assess for differences in scores before and after the educational session. The posttest also included evaluative questions regarding the session itself and the packet presented. These answers, along with the demographic data collected, were evaluated as well to look for common themes.

Setting: This provider educational session was held in a small conference room at North Hawai`i Community Hospital on June 4, 2019, from 5:30 to 7:30 pm. The room included a conference table with comfortable chairs, and a large screen in which the PowerPoint presentation could be projected. A small table was set up in the back of the room, to provide a light dinner and refreshments to the participants.

Subjects: Consecutive sampling was utilized for this provider group, as I recruited the entire population of providers that met the inclusion criteria (Polit & Beck, 2012). Inclusion criteria included OB or FM MD, or CNM, who work at WWC or HOP and are currently employed by Queen's Health Systems (QHS), and whose pregnant patients deliver at NHCH. I included providers who see patients in clinic only and provide prenatal services, even if they do not do deliveries. Exclusion criteria included providers whose patients deliver at other facilities, or providers who may have patients that deliver at NHCH but are in an independent practice and therefore not employed by QHS. The reason for this is that the University of Hawai`i at Hilo

currently has a Memorandum of Agreement with NHCH and QHS, but does not with any of the independent providers that deliver patients at NHCH. Therefore, all of the providers from Waimea Women's Center and Hale Ola Pono whose patients deliver at NHCH were invited. They were initially informed of this project and the upcoming educational session during a women's health meeting. This was followed up with an email confirming the date, time and location. Six of the seven total possible participants attended the session–the one who did not attend was out of state at the time.

Specific Aim 3: Improve accessibility to, and increase, education and culturally appropriate breastfeeding resources for prenatal patients.

Objective 1: Meet with patients, on a free and voluntary basis, before or after their prenatal appointment, at Waimea Women's Center and/or Hale Ola Pono clinics, to perform breastfeeding education using the standardized education packet

Objective 2: Administer a pre- and posttest to these participating prenatal patients to determine their knowledge of basic breastfeeding information prior to the session, and to assess the effectiveness of the teaching material afterward.

D (Develop): The education packet developed in Specific Aim 1 was presented to patients during participant sessions, and addresses Objective 1.

E (Execute): I set up a small informational table directly across from the Waimea Women's Center, in the Lucy Henriques building of North Hawai`i Community Hospital. The sessions were provided over two consecutive days, June 5 and 6, 2019, during full clinic hours, 8:00 am to 5:00 pm. Recruitment signage (Appendix K) was posted at the WWC, as well as on the front of the informational table. Bottled water and granola bars were provided to these participants. Participants were all given a consent handout, pretest and anonymous demographic

questionnaire prior to the session. I then went over the packet with each participant in a timely and efficient manner, and then allowed open time for questions about breastfeeding. The sessions consisted of visual, written and oral education, via the prenatal breastfeeding education packet, and lasted an average of 10 minutes. The participants were then all given posttests after the session (see instrument section below).

E (Evaluate): Evaluation addressed Objective 2, and consisted of analyzing the data collected in the pre- and posttests, to assess for differences in scores before and after the educational session. The posttest also included evaluative questions regarding the education packet's content and value. These answers, along with the demographic data collected, were evaluated as well to look for common themes.

Setting: Upon prior approval from North Hawai`i Community Hospital administration, I set up a small table in an unused space directly across from the Waimea Women's Center front desk and waiting room. I was there for two consecutive days, during clinic hours, as stated previously. As no personal or private information was exchanged, a private room was not necessary, however this space still offered a quiet space for uninterrupted education and discussion. I provided the small folding table, and utilized comfortable chairs from the unused waiting area for myself and participants to use.

Subjects: Subjects were recruited via convenience sampling. While convenience sampling is considered a weak form of sampling, it is the most commonly used (Polit & Beck, 2012). For the purposes of this project, it was also the most efficient way to get participants, without obtaining any further identifying information from them. Inclusion criteria included pregnant females in their third trimester, who are patients of WWC or HOP; they could be intending to breastfeed, or not, or have no decision made about infant feeding. Inclusion criteria

also included competency in reading, speaking and understanding the English language. Exclusion criteria includes males, and women who are not pregnant, are earlier than their third trimester, or have already delivered their baby. I also excluded women who see providers outside of WWC and HOP for their prenatal care, or do not have basic competency in English. As stated previously, signage was posted at the WWC and at the front of my informational table. The providers at the Waimea Women's Center also assisted in sending qualifying patients to me after they finished their prenatal appointment. Participation was completely voluntary and anonymous. A total of fifteen subjects were recruited and participated in this project.

Instruments

To evaluate the effectiveness of the educational sessions, and the prenatal breastfeeding education packet, the Breastfeeding Knowledge Questionnaire (BKQ) was used. The BKQ was created by F. Dreesmann in 2014, as part of a graduate thesis. Dreesmann adapted a Malay tool, with permission, then shortened the tool and modified the question domains (F.F. Dreesmann, personal communication, April 2-3, 2019). The current version of the BKQ has seven domains, with two questions per domain, totaling fourteen questions. Each question has the response choices of true, false, or not sure (Dreesmann, 2014). This instrument was evaluated for content validity in the following manner:

> A panel of three breastfeeding content experts (two certified lactation consultants and a CSUC RN, MSN, PhD Obstetric Nursing Professor) reviewed the BKQ instrument for content, clarity and readability. All three content experts approved the content validity of the BKQ as a tool to measure breastfeeding knowledge (Dreesmann, 2014, p. 39).

According to the creator, the BKQ has been used in four other studies (F.F. Dreesmann, personal communication, April 2-3, 2019)

Permission was granted, by Dreesmann, to use and adapt the BKQ for this PIP (see Appendix A) (F.F. Dreesmann, personal communication, April 2-3, 2019). The patient participant group was given the original BKQ as both a pre- and posttest. The tool was modified for the provider participant group by converting the questions into multiple choice, instead of true/false. True/false questions are a type of dichotomous question and are appropriate for gathering facts. However, multiple-choice questions are often used to gain more information, and, in the case of this PIP, assess content knowledge and learning a bit more effectively (Polit & Beck, 2012). The rationale for this modification is that the providers should be able to gain a deeper level of understanding of the content, which is better shown with multiple-choice questions. Despite this modification, the core of the questions, and the domains in which they lay in the original instrument, remained the same. The modified version for the providers was tested for readability via Microsoft Word, and found to have a Flesch Reading Ease score of 68.8, and a Flesch-Kincaid Grade Level of 6.1. The providers were given this modified version of the BKQ as both the pre- and posttest. Each group of participants also had four additional, evaluation questions on their posttests. Both groups were asked what their favorite part of the material and presentation was, and which part they would change; these were open-ended questions. Providers were asked if they found the material valuable to themselves, as providers, and also if they felt that the packet would be valuable to their prenatal patients; these were yes/no questions. Patients were asked if the material in the packet was easy to understand, and also if they felt that the packet is valuable for prenatal patients; these were yes/no questions. See Appendices G and I for the pretests, and Appendices H and J for the posttests.

In addition to the Breastfeeding Knowledge Questionnaire, basic, non-identifying demographic data was also be collected from both the provider participants and patient

participants (Appendices E and F). The information collected in these demographic questionnaires was evaluated for any common themes or trends in the data results. The demographic data was also used to compare the findings from this project with findings discovered in the review of literature.

Data Analysis

There were two participant groups involved in this project: the providers and the patients – each with their own, separate educational sessions and data collection. This quality improvement project utilized one group pretest/posttest design, with structured self-report instruments for each participant group (Polit & Beck, 2012). Each group was represented by a specific aim – providers were represented in Specific Aim 2 and patients were represented in Specific Aim 3. Both sets of data were analyzed the same way, but separately. Collected data was inputted, sorted and analyzed in Microsoft Excel spreadsheets. For each group and test, correct answers scored one point each, and incorrect answers scored zero points. Each participant groups' data was analyzed with 2-tailed paired t-tests, to evaluate the differences in pre- and posttest scores, which in turn evaluated the effectiveness of the educational materials. Descriptive statistics were also analyzed to determine each group's mean difference in test scores, standard deviation, confidence level and confidence interval. The information gathered from the demographic questionnaires was analyzed for trends and compared to findings the review of literature (Polit & Beck, 2012).

Protection of Human Subjects and Ethical Considerations

This was a quality improvement project that utilized existing information and educational materials, that are free to use and readily available. The purpose was to provide education regarding those materials and evaluate the effectiveness of them. There was no

identifying information collected from participants. This project obtained approval for human research as an exempt project from the University of Hawai'i (UH) Human Studies Program and Institutional Review Board (IRB). Although there was a pre-existing Memorandum of Agreement (MOA) between University of Hawai`i at Hilo and the Queen's Medical Center (QMC), which covers North Hawai`i Community Hospital, a letter of support for this project was obtained from NHCH administration. This project was also submitted to the Queen's Medical Center's Research and Institutional Review Committee, since it took place on NHCH grounds and involved participants who were both patients and employees of Queen's Health Systems and North Hawai`i Community Hospital. This project was deemed a quality improvement project and not considered human studies research, and therefore was approved and required no further oversight by this agency. The approval documents are located in Appendices M, N, and O.

At the guidance of the UH IRB, each participant was given a consent handout. This is a document that describes the project purpose and why they were recruited to participate. It also explained that their participation was free, voluntary and anonymous, and that they could stop or leave at any time without penalty. The consent handout is a document that participants can keep, but they do not sign. Per the UH IRB, since their signature would be the only thing identifying them as a participant, a handout takes that identifier away, and provides language that their attendance and participation serves as their consent to participate in the project (Appendices C and D).

Summary

This chapter presented the overall project design, describing it as a quality improvement project. The methodology for all three aims and their objectives were discussed, using the FADE QI model. Subject sampling and settings for data collection were presented, as were the

instruments and methods for evaluation and data analysis. Ethical considerations and protection of human subjects were also discussed. Chapter IV will present the results of the data gathered.

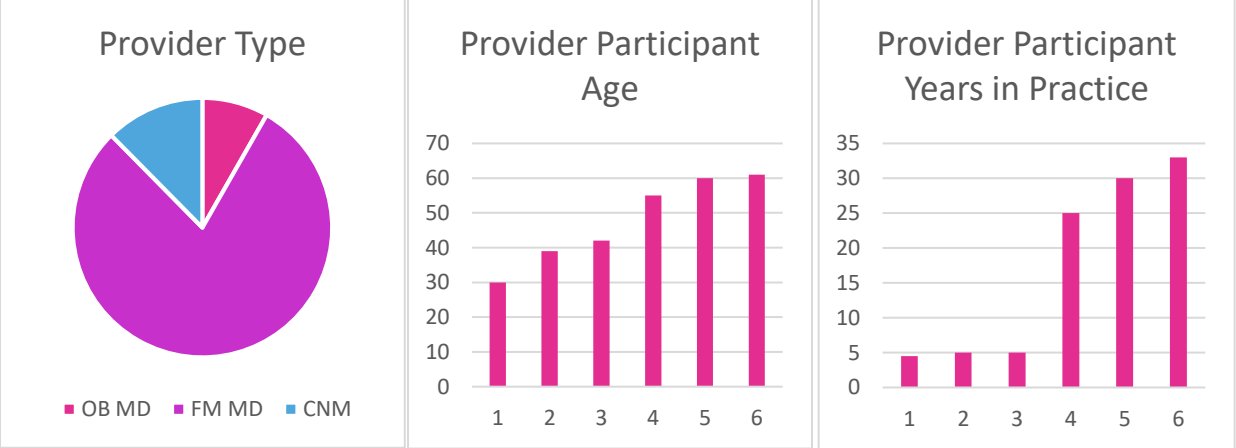
CHAPTER IV:

RESULTS

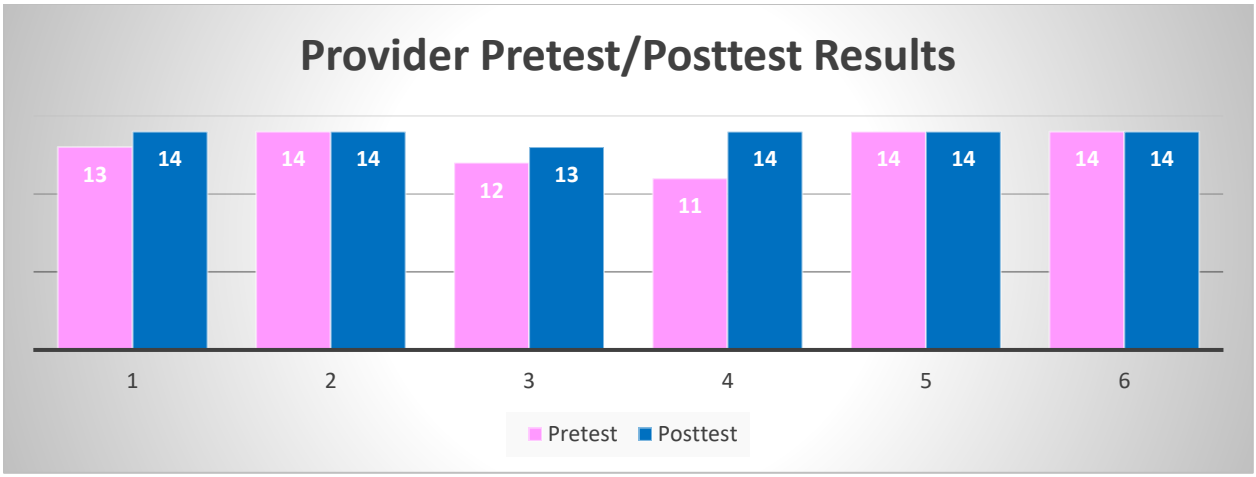
This chapter will present the results from the analysis of data collected in both the provider session and the two days of patient sessions.

Provider Participant Results

Six total providers participated in the project. As stated previously, the seventh provider that met criteria was out of the state; this was an 86% participation rate. Three participants were Certified Nurse Midwives (CNM), two were OB MDs, and one was a FM MD. One participant was a male, and the other five were female. The average age of participants was 47.8 years old and average length of practice in their current specialty was 17 years.



On a scale of 1-5, the average self-reported level of breastfeeding knowledge was 3.3. Four of the participants, or 66.7%, have had prior, personal breastfeeding experience. The mean pretest score was 13, and the mean posttest score was 13.83, out of a possible 14 points, making the mean difference in scores 0.83.



A paired t-test was performed to determine whether there was a statistically significant mean difference between these participants' pre- and posttest scores after their attendance in the edcuational session and review of the education packet. Descriptive statistics were also calculated, based off the mean score difference, to determine the standard deviation, confidence level and interval.

t-Test: Paired Two Sample for Means		
	PRETEST SCORE	*POSTTEST SCORE*
Mean	13	13.83333333
Variance	1.6	0.166666667
Observations	6	6
Pearson Correlation	0.387298335	
Hypothesized Mean I	0	
df	5	
t Stat	-1.746075739	
P(T<=t) one-tail	0.070617387	
t Critical one-tail	2.015048373	
P(T<=t) two-tail	0.141234773	
t Critical two-tail	2.570581836	

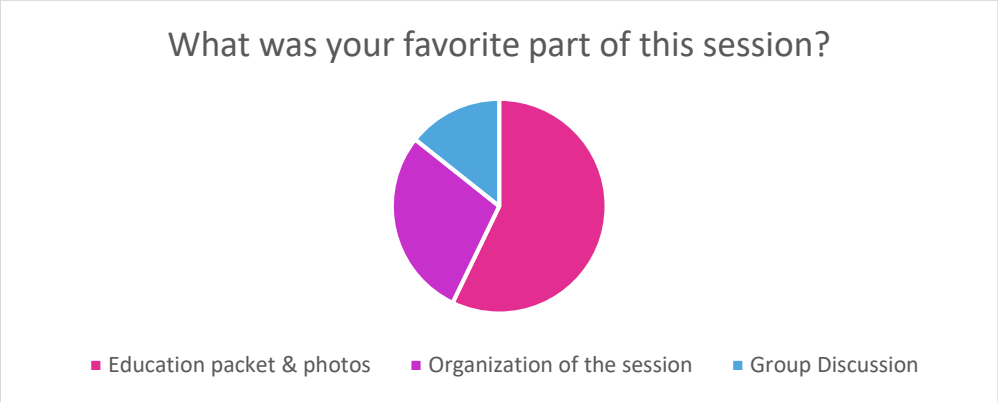
Provider Data: Descriptive Stats	
Mean	0.833333333
Standard Error	0.477260702
Median	0.5
Mode	0
Standard Deviation	1.169045194
Sample Variance	1.366666667
Kurtosis	2.55205235
Skewness	1.585617515
Range	3
Minimum	0
Maximum	3
Sum	5
Count	6
Confidence Level(95.0%)	1.226837692

The mean improvement in test scores (M=0.833, SD=1.169, N=6) was only slightly greater than zero, t(5)=1.75, two-tail p=0.14, which provides minimal evidence that the educational session and review of the prenatal breastfeeding education packet is effective in the

teaching of prenatal care providers. A 95% confidence interval about mean difference in scores is (-0.40, 2.06). This means that we can be 95% certain that the true mean of test score differences falls within these numbers. This data implies that these results from the provider participant group may not be statistically significant. There was a difference in some of the test scores, but the small sample size makes it difficult to generalize these results.

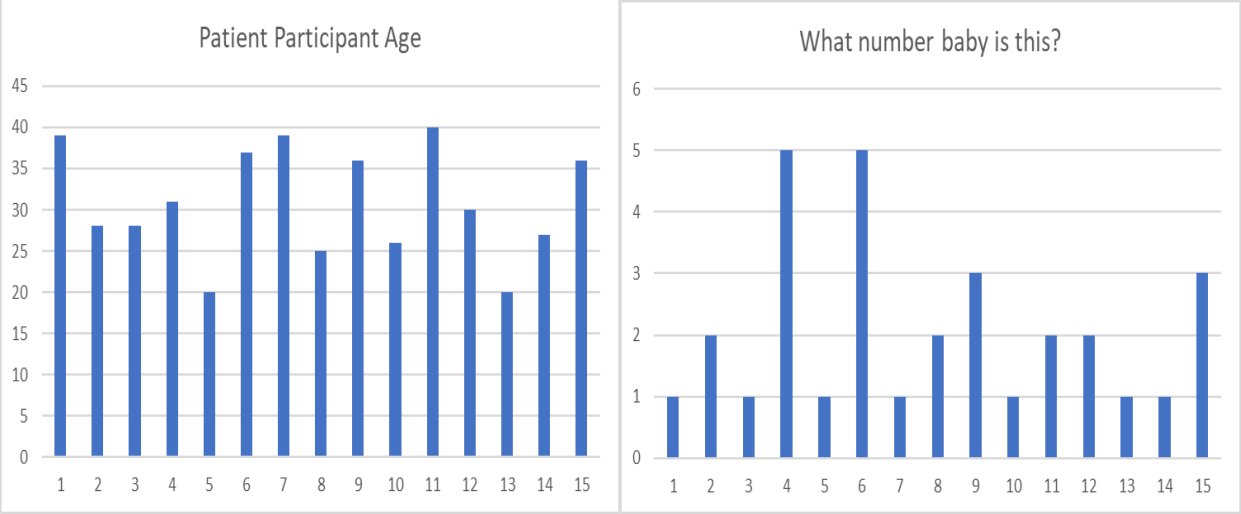
Provider Participant Qualitative Results

In analysis of the qualitative, evaluation questions asked on the posttest, 100% of participants found the education packet to be valuable to both them as a prenatal provider, and to their prenatal patients. When asked what their favorite part of the session was, 66.7% of the participants reported that they liked the education packet and its images, 33.3% reported liking the organization of the session itself, and 16.7% reported the group discussion as their favorite part. When asked what could be changed or improved in regards to the education packet, one provider reported a concern about the cost of reproduction of the materials, as it is five-pages of color. One other provider stated she would like to see images of women of color, as the images available from the Lactation Education Resources were all of Caucasian-appearing women.



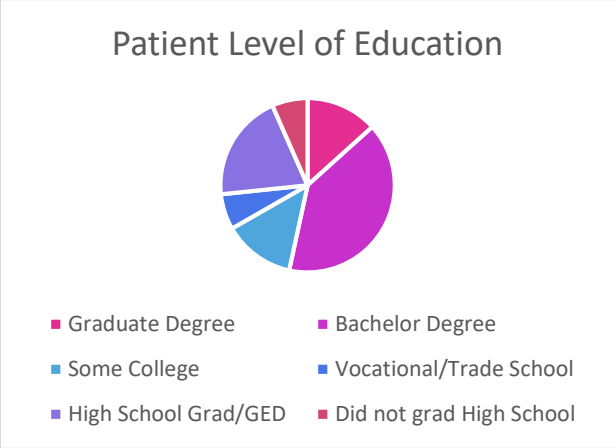
Patient Participant Results

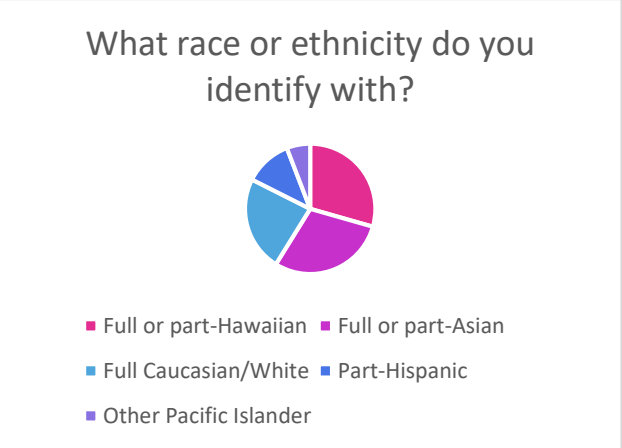
Fifteen total patient participants took part in this project. As I only set up outside of the Waimea Women's Center, 100% of participants were patients of WWC, and all 100% saw both OB MD's and CNM's for their prenatal care. This means that all of these patients have seen multiple different providers throughout their prenatal course, thus far. The ages ranged from 20 to 40 years old, with an averge of 30.8 years old. When asked what number baby they were currently pregnant with, the range was baby number one, to baby number five, with the average being that they were currently carrying their second baby. The image below shows that 46.7% of partipants were carrying their first child.



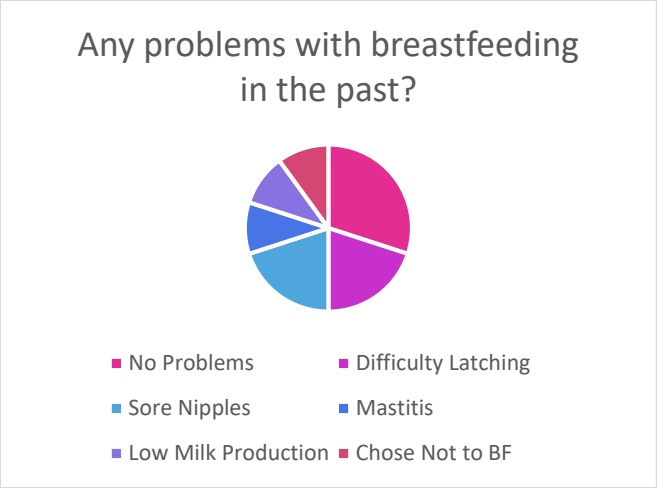
Education level of patient participants was varied: 13.3% reported having a graduate degree, 40% reported having a bachelor's degree, 13.3% reported having had some college, 6.6% reported having gone to vocational or trade school, 20% reported having a high school diploma or GED, and 6.6% reported she did not graduate high school. Approximately 73.3% of participants reported being married, with the remaining 26.7% identifying as unmarried but currently involved with the father of the baby. When asked which race(s) they identify as, 33.3% reported identifying as Hawaiian or part-Hawaiian, 26.7% identified as Asian or part-Asian,

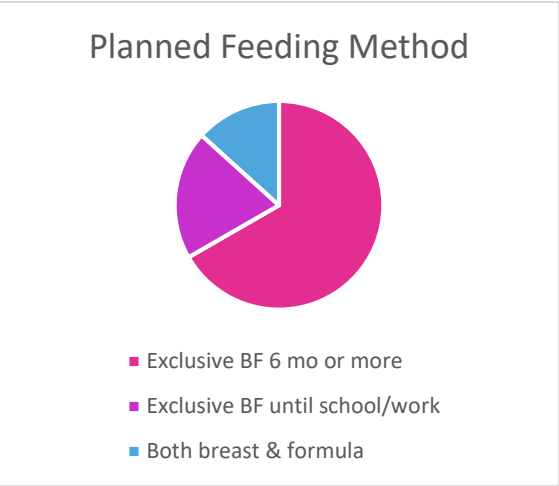
26.7% identified as full Caucasian or white, 13.3% identified as part-Hispanic, and 6.6% identified as other Pacific Islander.



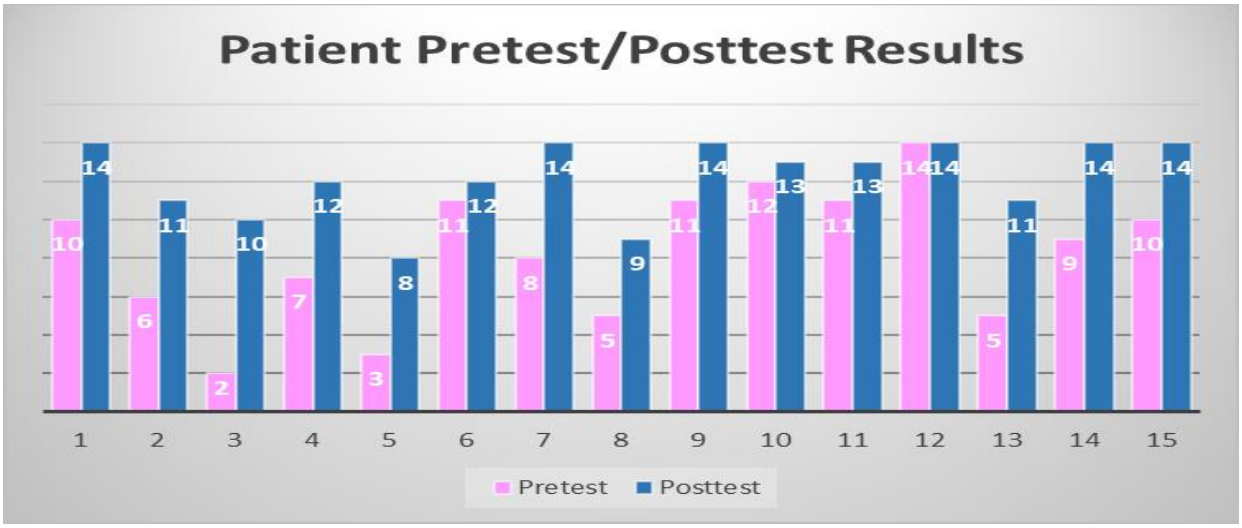


Those participants not having their first baby were asked if they had problems breastfeeding in the past, and, if yes, what problem or obstacle did they encounter. While 37.5% reported having no problems breastfeeding, 25% reported difficulty with latching, 25% reported sore nipples, 12.5% reported mastitis, 12.5% reported low milk production, and 12.5%, or one participant reported that she just chose to not breastfeed once she was home from the hospital. When asked about their feeding plans for this baby, 66.7% reported wanting to exclusively breastfeed for six months or longer, 20% reported wanting to exclusively breastfeed until they had to go back to school or work, and 13.3% reported a desire to do both breast and formula feeding. One final bit of data that is important to note is that 26.7% of participants reported not receiving any breastfeeding information, thus far, from their prenatal care provider.





The mean pretest score for the patient participants was 8.27, and the mean posttest score was 12.2, out of a possible 14 points, making the mean difference in scores 3.93.



A paired t-test was performed to determine whether there was a statistically significant mean difference between these participants' pre- and posttest scores after receiving education via the prenatal breastfeeding education packet. Descriptive statistics were also calculated, based off the mean score difference, to determine the standard deviation, confidence level and interval.

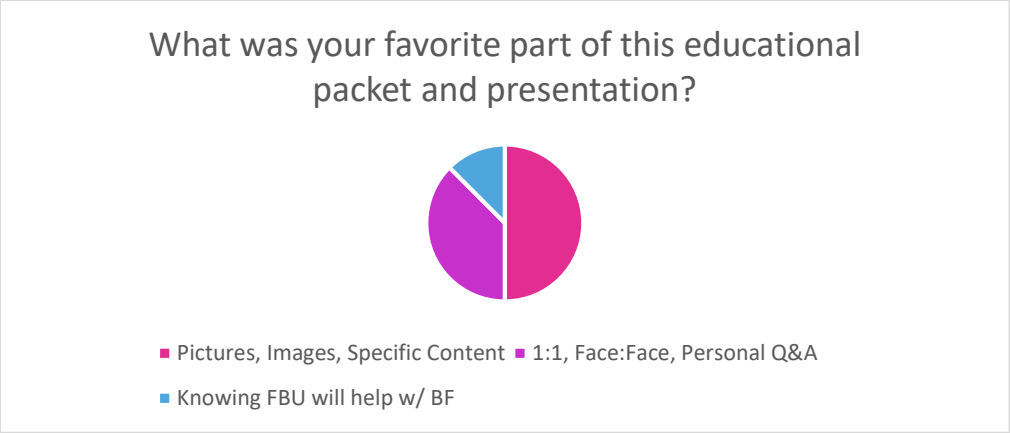
t-Test: Paired Two Sample for Means		
	PRETEST SCORE	POSTTEST SCORE
Mean	8.266666667	12.2
Variance	12.20952381	4.028571429
Observations	15	15
Pearson Correlation	0.816810732	
Hypothesized Mean Difference	0	
df	14	
t Stat	-6.967053942	
P(T<=t) one-tail	3.29142E-06	
t Critical one-tail	1.761310136	
P(T<=t) two-tail	6.58283E-06	
t Critical two-tail	2.144786688	

Descriptive Statistics for Patient Data	
Mean	3.933333333
Standard Error	0.564561918
Median	4
Mode	5
Standard Deviation	2.186538905
Sample Variance	4.780952381
Kurtosis	-0.320635936
Skewness	-0.233437355
Range	8
Minimum	0
Maximum	8
Sum	59
Count	15
Confidence Level(95.0%)	1.210864885

The t-statistic is higher than the two-tailed P value, which implies statistical significance in the results. The mean improvement in test scores (M=3.933, SD=2.186, N=15) was significantly greater than zero, t(14)=6.97, two-tail p=6.58, providing further evidence that the educational packet is effective in teaching prenatal women about breastfeeding. A 95% confidence interval about mean difference in scores is (2.72, 5.14). This means that we can be 95% certain that the true mean of test score differences falls within these numbers.

Patient Participant Qualitative Results

In analysis of the qualitative, evaluation questions asked on the posttest, 100% of participants found the education packet easy to understand, and felt that it is valuable for prenatal patients. None of the participants reported anything that they would change or like to see differently. When asked what their favorite part of the session was, 53.3% of participants reported liking the pictures, images, or identified specific content included in the packet, 40% reported liking the personal aspect of a one-to-one or face-to-face educational session and being able to ask questions in the moment, and 13.3% reported that their favorite part was finding out that the nursing staff at the Family Birthing Unit are all trained to assist with breastfeeding in real-time, after they deliver their infant.



Discussion and Summary of Results

The provider participants did well enough on their pretests, that the mean difference in scores between the pre- and posttests was less than one. This implies that the results gathered do not have statistical significance. The small sample size of the provider participant group may be a primary influencing factor in this as well. However, as 100% of participants found value in the education packet for themselves and their patients, there is significance in the packet itself as a tool, that was not reflected in the collected data.

The patient participant group had a larger mean difference in their pre- and posttest scores, showing true statistical significance in the data. The raw scores alone illustrate that almost every patient gained new knowledge after being presented with, and given education from, the prenatal breastfeeding education packet. All of these participants found the packet easy to understand, and felt that it is valuable to prenatal patients. None of the participants reported anything that they would change or like to see differently. This information implies that the education packet is a successful tool to educate prenatal patients about breastfeeding.

This chapter presented the results of all of the data that was collected and analyzed for this PIP. This information was presented, utilizing a variety of tools and images to help illustrate and display the data. Chapter V will discuss the project limitations, barriers and facilitators. It

will also present future implications for practice, as well as recommendation and conclusions based on the knowledge gained in this project.

CHAPTER V:

RECOMMENDATIONS AND CONCLUSIONS

This chapter will evaluate the results against the desired and expected outcomes presented in chapter I. It will also present project limitation and facilitators, as well as present implications for practice. This chapter will also serve to conclude this project.

Outcomes Evaluation

The primary desired outcome of this project, identified in chapter I, was for obstetric patients of NHCH to have increased confidence and preparedness to exclusively breastfeed their infants, via education and support provided to them in the prenatal period. The significant increase in the mean test scores for the patient participant group imply that the patients who received breastfeeding education via the packet did have a greater knowledge base regarding breastfeeding. This knowledge increases their preparedness to exclusively breastfeed, which, in turn, likely increases their confidence to do so. The second expected outcome was for the prenatal providers servicing NHCH to have an increased awareness of the benefits of breastfeeding, and the confidence to educate their prenatal patients on basic breastfeeding topics, in accordance with the Ten Steps. Although the difference in their mean test scores was not, technically, statistically significant, they did al express perceived value in the education packet for both providers and patients. Some individual test score differences showed a significant improvement, which implies gained knowledge as a result of their educational session. Therefore, the expected outcomes were met.

Limitations

The primary limitation of this project was sample size. Six of seven possible providers participated, which still resulted in a very small ‘n.’ The mean difference in test scores for this

group was also statistically insignificant, which could also be affected by the small sample size. Therefore, these results are not generalizable. There was also a small sample size, fifteen, for the patient participant group. With an average of thirty-five to forty deliveries per month at NHCH, this sample represents a little less than half of the delivering population. The mean difference in test scores for this participant group was statistically significant, however, the small 'n' makes it difficult to generalize these results outside of North Hawai`i Community Hospital as well.

Time was another limitation. Due to the school-imposed time constraints on this PIP, I was not able to spend as much time as I could have on data collection. While it would not have made a difference for the provider group, more time would have allowed more days to collect data on patient participants, and would have allowed me to also spend time at Hale Ola Pono Primary Care to meet with those prenatal patients as well. A final limitation for this project was the tool. While I am very appreciative to have found the Breastfeeding Knowledge Questionnaire (BKQ) and am grateful to Dreesmann for allowing me to modify and use it for this PIP, it was a preexisting tool and therefore not specific for my prenatal breastfeeding education packet. A tool especially designed to evaluate the information provided in the packet may have showed greater statistical significance in the test results.

Facilitators

There were multiple factors that helped to facilitate this project. My committee members were both knowledgeable regarding the topic of breastfeeding and education, as well as eager and excited for me to complete this PIP. They, therefore, provided a lot of feedback and support to me throughout the entire process. Likewise, the administration and staff of North Hawai`i Community Hospital were supportive of this Practice Inquiry Project from the very beginning and eagerly encouraged me, and participated. I was fortunate to have eager participants in both

the provider and the patient groups, which enabled the data collection portion to run very smoothly. Lastly, I was able to find a lot of strong literature to support my project goal, as well as the aims and objectives.

Implications for Practice

The results of this PIP have multiple implications for future practice. This project did confirm a gap in prenatal breastfeeding education provided to the patients at North Hawai`i Community Hospital, and also showed a significant increase in knowledge when they were presented with the education packet. If the prenatal providers begin to distribute and discuss this packet as intended in this PIP, the knowledge base of the patients entering the Family Birthing Unit for delivery will be significantly greater, making them better prepared for exclusive breastfeeding, which should lead to an increase in exclusive breastfeeding rates.

Potential Future Projects

During both the proposal and data collection phases of this project, NHCH administration and staff had been very interested in other projects stemming from these results. For example, there is interest to share the educational session and the education packet with prenatal providers who are in private practice, yet delivery babies at NHCH. An administrator also suggested sharing the packet with the community pediatricians, and perhaps having and educational session for them, so that they can also have the same knowledge base and information to pass along and educate parents. While this Practice Inquiry Project was self-limiting and anonymous, an idea was presented by an administrator to follow a cohort of patients, some receiving the prenatal breastfeeding education packet, and others not, and test them before, in the hospital, and at some point in the postpartum period to evaluate ongoing success of the prenatal education, and its impact on exclusive breastfeeding rates. What I am hoping, is that the results of this project will

be convincing enough to generate administrative support to create an actual prenatal class for the patients of NHCH, focusing on breastfeeding, while including basic parenting skills and information regarding the labor process and unit routines.

Once all of the school-based obligations are finished, and this project is completed, I plan to meet again with the women's health committee, and hospital administration, to discuss my findings and the results of this project. The purpose will be to discuss the above-mentioned future implications and potential projects, and allow the providers to begin distributing and teaching the education packets. A plan for a prenatal class will also be discussed.

Conclusion

The benefits of breastfeeding for both mother and infant have been presented, as well as the infant feeding recommendations from international and national organizations. This manuscript described the significance of increasing exclusive breastfeeding rates in Hawai`i County on the healthcare of the population and state. This Practice Inquiry Project presented three project aims, and their accompanying objectives, and discussed how each was met and evaluated. A prenatal breastfeeding education packet was created using existing data and materials. This packet was presented to a provider participant group which, although did not statistically gain significant knowledge, found great value in it for both providers and patients. The packet was also presented to a patient participant group which did show a significant increase in breastfeeding knowledge as a result of it, in addition to finding great value in the packet, and the education received.

This PIP identified a problem, a gap in care and education, and, following a quality improvement model, created an education packet to address it. Both the needs assessment and the analyzed data show that prenatal women on the Big Island are in need of quality,

standardized breastfeeding education. While there is still a lot of work to be done, and many more project ideas resulting from this PIP, I have shown that the prenatal breastfeeding education packet is one, easy way to address this gap, and provide our prenatal patients with some of the knowledge that they need to be successful in breastfeeding and providing for their infant.

Appendix A:

Permission to Use Breastfeeding Knowledge Questionnaire

Conversation Information
Felicia Dreesmann
Messages

Amy
Aloha! My name is Amy Hanapi & I'm finishing up my Family NP/DNP program at University of Hawaii at Hilo. My final practice inquiry project is on breastfeeding education. My advisor really wants me to use an existing evaluation tool instead of making up my own, and I came across your MSN thesis online, from 2014. You created the Breastfeeding Knowledge Questionnaire, and I saw you had it evaluated for content validity. The questions are all totally relevant to my topic as well. I'm wondering if you would give me permission to use your BKQ tool for my project?
You can reply here, or my email is ahanapi@hawaii.edu
Thank you so much!

Felicia
Hello Amy, Yes you have my permission to use my BKQ tool for your project. Hope you project goes well.

Amy
Thank you so, so much! Just for background, did you get the questions or modify them from another source? And do you know if it's been used again, after your thesis?

Felicia
I reviewed different measurement instrument/ tools from other research articles and found one that I like from a research article titled, Reliability and validity of a Malay - version questionnaire assessing knowledge of breastfeeding (2010) authors, Tengku & Sulaiman, from Malaysian Journal of Medical Sciences. I liked their tool and was given permission to use and modify their tool for my study. I modified the tool and changed it mainly to shorten the length of time required for women to complete it, I also modified the domains. I have had 4 people who have requested to use the Breastfeeding questionnaire.

Amy
Great! Thanks so much, again!

Appendix B:

Permissions to Use Publicly Sourced Images and Educational Materials:

FirstLatch.net

The following message is on every handout provided by FirstLatch.net, allowing free usage, copying, and distribution of their education materials. Full citation with link to their website is also included in the footer of each page of the educational packet:

Provided for you by Lactation Education Resources 2016. May be freely copied and distributed. Please be aware that the information provided is intended solely for general educational and informational purposes only. It is neither intended nor implied to be a substitute for professional medical advice. Always seek the advice of your healthcare provider for any questions you may have regarding your or your infant's medical condition. Never disregard professional medical advice or delay in seeking it because of something you have received in this information. www.LactationTraining.com

Clipart Library

The following is message is on each of the two clipart images used in the education packet. The images are not being used for commercial use. A full citation with link to their website is provided in the footer of each page of the educational packet:

Breastfeeding Cliparts #36973
(License: for no commercial use)
in other cases add a link to our website
Breastfeeding Cliparts #36969
(License: for no commercial use)
in other cases add a link to our website

Appendix C:

Patient Consent Handout

University of Hawai'i
Consent to Participate in a Research Project

Amy A. Hanapi, Student Researcher and Investigator
Improving Prenatal Breastfeeding Education in a Baby-Friendly Facility in Hawai`i County

Aloha! You are being asked to participate in a research project conducted by Amy Hanapi, RN-C, BSN from the University of Hawai`i at Hilo, School of Nursing. The results of this project will contribute to my final Practice Inquiry Project, as I complete the requirements for my degree in Family Nurse Practitioner and Doctor of Nursing Practice.

What am I being asked to do?
If you participate in this project, you will be asked to receive free, prenatal breastfeeding education, and evaluate it.

Taking part in this project is your choice.
You can choose to take part or you can choose not to take part in this project. You also can change your mind at any time. If you stop being in the project, there will be no penalty or loss to you.

Why is this project being done?
The purpose of my project is to improve prenatal breastfeeding education to women who are in their third trimester of pregnancy, and planning to deliver their babies at North Hawai`i Community Hospital. My project will be providing education to both providers and patients. You have been asked to participate because you are a prenatal patient of Waimea Women's Center or Hale Ola Pono primary care clinic, you are in your third trimester, speak and understand English, and are planning to deliver your baby at North Hawai`i Community Hospital.

What will happen if I decide to take part in this project?
If you participate in this project, you will sit at this designated, informational table, to receive a free, prenatal breastfeeding education packet. This packet contains both written and visual material, and the educational session will be aided with verbal breastfeeding education. The entire session sill last no more than 30 minutes. During this time, you will also be asked to complete a 14-question pretest, and 18-question posttest, as a way to evaluate both your learning, and the material presented to you.

What are the risks and benefits of taking part in this project?
The benefit to you is that you will gain further knowledge regarding basic breastfeeding topics. You will also be able to keep the education packet, to use as a resource at home. There is little to no risk to you, as a participant, except for the time commitment that is required.

University of Hawai'i
Consent to Participate in a Research Project

Amy A. Hanapi, Student Researcher and Investigator
Improving Prenatal Breastfeeding Education in a Baby-Friendly Facility in Hawai`i County

Results of Research:
Results of this project will not be released to research participants. However, the results and findings may be used to improve breastfeeding education provided to prenatal patients.

Privacy and Confidentiality:
I will not collect any identifying information. All data collected will be kept in a secure location. Only myself and my PIP committee members (2) will have potential access to it. Other agencies that have legal permission, have the right to review research records. The University of Hawai`i Human Studies Program has the right to review research records for this project.

Compensation:
There is no monetary compensation for participation in this project. If you do agree to attend and participate in the educational session, light snacks and refreshments will be provided to you.

Questions: If you have any questions about this project, please call or email me at 808.989.9852 or ahanapi@hawaii.edu. You may also contact my advisor, Dr. Kimberly Shmina, at 808.920.7810 or kshmina@hawaii.edu. You may contact the UH Human Studies Program at 808.956.5007 or uhirb@hawaii.edu to discuss problems, concerns and questions; obtain information; or offer input with an informed individual who is unaffiliated with the specific research protocol. Please visit http://go.hawaii.edu/jRd for more information on your rights as a research participant.

Participating in this learning activity and completing the questionnaires before and after will be taken as consent to participate.

You may keep this consent handout for your records and reference.

Mahalo!

Appendix D:

Provider Consent Handout

University of Hawai'i
Consent to Participate in a Research Project

Amy A. Hanapi, Student Researcher and Investigator
Improving Prenatal Breastfeeding Education in a Baby-Friendly Facility in Hawai`i County

Aloha! You are being asked to participate in a research project conducted by Amy Hanapi, RN-C, BSN from the University of Hawai`i at Hilo, School of Nursing. The results of this project will contribute to my final Practice Inquiry Project, as I complete the requirements for my degree in Family Nurse Practitioner and Doctor of Nursing Practice.

What am I being asked to do?
If you participate in this project, you will be asked to attend an educational session pertaining to breastfeeding and breastfeeding education, and evaluate the material. The date, time and exact location are yet to be determined, but it will take place on the campus of North Hawai`i Community Hospital, and will be either during the week after clinic hours, or on a weekend day.

Taking part in this project is your choice.
You can choose to take part or you can choose not to take part in this project. You also can change your mind at any time. If you stop being in the project, there will be no penalty or loss to you.

Why is this project being done?
The purpose of my project is to improve prenatal breastfeeding education to women who are in their third trimester of pregnancy, and planning to deliver their babies at North Hawai`i Community Hospital. My project will be providing education to both providers and patients. You have been asked to participate because you are a provider employed by Queen's Health Systems, who cares for prenatal patients at either Waimea Women's Center or Hale Ola Pono primary care clinic, and your patients deliver at North Hawai`i Community Hospital.

What will happen if I decide to take part in this project?
If you participate in this project, you will be asked to come to an educational session on breastfeeding. Topics will include the facility infant feeding policy, basic breastfeeding knowledge, and the prenatal breastfeeding education packet that I created for prenatal patients. This session will be comprised of a combination of learning activities, including audio/visual presentation, discussion, one short role-playing exercise, and question/answer time. There will be a short, 14-question pretest, and an 18-question posttest, as a way to evaluate both your learning and the material presented. The total time allotted will be three hours, however it is unlikely that the session will last more than 2 hours.

University of Hawai'i
Consent to Participate in a Research Project

Amy A. Hanapi, Student Researcher and Investigator
Improving Prenatal Breastfeeding Education in a Baby-Friendly Facility in Hawai`i County

What are the risks and benefits of taking part in this project?
The potential benefit to you is that you may gain further knowledge regarding breastfeeding and our unit feeding policy. You will also learn about the prenatal education packet that I created, to be given to prenatal patients in their third trimester. There is little to no risk to you, as a participant, except for the time commitment that is required.

Results of Research:
Results of this project will not be released to research participants. However, the results and findings may be used to improve breastfeeding education provided to prenatal patients.

Privacy and Confidentiality:
I will not collect any identifying information. All data collected will be kept in a secure location. Only myself and my PIP committee members (2) will have potential access to it. Other agencies that have legal permission, have the right to review research records. The University of Hawai`i Human Studies Program has the right to review research records for this project.

Compensation:
There is no monetary compensation for participation in this project. If you do agree to attend and participate in the educational session, light snacks and refreshments will be provided to you.

Questions: If you have any questions about this project, please call or email me at 808.989.9852 or ahanapi@hawaii.edu. You may also contact my advisor, Dr. Kimberly Shmina, at 808.920.7810 or kshmina@hawaii.edu. You may contact the UH Human Studies Program at 808.956.5007 or uhirb@hawaii.edu to discuss problems, concerns and questions; obtain information; or offer input with an informed individual who is unaffiliated with the specific research protocol. Please visit http://go.hawaii.edu/jRd for more information on your rights as a research participant.

Participating in this learning activity and completing the questionnaires before and after will be taken as consent to participate.

You may keep this consent handout for your records and reference.

Mahalo!

Appendix E:

Patient Demographics Questionnaire

Patient Demographics and Background

1. What is your current age?_____

2. What racial or ethnic group(s) do you identify with most? (you may pick more than one)

a. White/Caucasian
b. Black/African-American
c. Hispanic
d. Native Hawaiian/part-Hawaiian
e. Other Pacific Islander
f. Asian or Filipino
g. Native American or Alaska Native
h. Other: (please specify) _____

3. What is your marital status?

a. Single, father of baby not involved
b. Single or not married, father of baby is involved
c. Married/Legal union
d. Widowed
e. Divorced or legally separated

4. What is the highest level of education you have completed?

a. Did not graduate high school or obtain GED
b. High school graduate or GED
c. Vocational school, technical or trade school
d. Some college
e. Graduated undergraduate college/bachelor's degree
f. Some graduate school (master's or doctoral degree)
g. Graduated graduate school (master's or doctoral degree)

Patient Demographics and Background

5. Have you received any information on breastfeeding from any of the following sources? (select all that apply)
    a. Live, professional class
    b. Video/CD/DVD professional educational program
    c. On-line blog/vlog or YouTube video
    d. Social media sites
    e. Other on-line resources
    f. Books
    g. WIC
    h. Community-based lactation consultant or doula
    i. Family members and/or friends
    j. Your prenatal care provider(s)

6. What type of provider do you see for your prenatal care?
    a. OB/GYN physician
    b. Family Medicine physician
    c. Certified Nurse Midwife
    d. Both OB physician and Certified Nurse Midwife

7. What is your due date?_____

8. What number baby is this? _____ (if this is your 1st, please go to question 9)
    a. If this is not your first baby, have you breastfed before? **Y N**
    b. If yes, for how long did you breastfeed?_____
    c. Did you encounter any problems with breastfeeding in the past? **Y N** (if yes, please describe:_____)
    d. If you stopped before 6 months, why did you stop?_____
    e. If you have never breastfed before, why did you not breastfeed your prior child(ren)?_____

9. Are you planning to exclusively breastfed this baby?
    a. Yes, for at least 6 months
    b. Yes, until I go back to work or school
    c. I want to do both breastfeeding and formula
    d. I plan to give my baby only formula
    e. I don't know/am undecided on how I want to feed my baby

Appendix F:

Provider Demographics Questionnaire

Provider Demographics and Background

1. What is your gender?
   a. Male
   b. Female

2. What is your current age? _____

3. What is your practice specialty?
   a. Family medicine physician
   b. OB/GYN physician
   c. Certified nurse midwife

4. How long have you practiced in your specialty?_____

5. How would you rate your current level of knowledge regarding breastfeeding?

   1=no knowledge 5=extremely knowledgeable

   1 2 3 4 5

6. Do you have any personal experience with breastfeeding (either yourself or significant other)? Y N

Appendix G:

Patient Pretest (BKQ)

BREASTFEEDING KNOWLEDGE QUESTIONNAIRE
PATIENT PRETEST

For each statement below, please indicate your response by circling the number that most closely corresponds to your answer:

1 = True 2 = False 3 = Unsure

	True	False	Unsure
1. Women who have breastfed have a reduced risk of getting Type 2 Diabetes	1	2	3
2. Infants who have breastfed have a reduction in the incidence of developing Type 1 and Type 2 Diabetes	1	2	3
3. Colostrum is a mother's early milk, which contains antibodies to protect the newborn against disease	1	2	3
4. If a mother develops a sore, reddened, and swollen breast she should stop breastfeeding	1	2	3
5. Women who have breastfed have higher risk of breast cancer	1	2	3
6. If a mother feels she is not producing enough breast milk, she should supplement with formula	1	2	3
7. Proper latching involves getting the infant to latch onto the nipple and as much of the areola as possible	1	2	3
8. Infants who are breastfed are at increased risk of developing diarrhea	1	2	3
9. Human colostrum is sticky, thick, and yellowish in color	1	2	3
10. When a mother's breasts become engorged, she should discontinue breastfeeding for a couple days	1	2	3
11. Gently stroking an infant's check can elicit and infant's rooting reflex to turn towards the mother's breast with mouth wide open	1	2	3
12. Expressed breast milk can be kept refrigerated up to eight days	1	2	3
13. To avoid over-feeding, it is important to limit feedings at each breast to 5 minutes	1	2	3
14. Exclusively breastfed infants feed anywhere from 8 to 12 times a day	1	2	3

Appendix H:

Patient Posttest (BKQ with Evaluation Questions)

BREASTFEEDING KNOWLEDGE QUESTIONNAIRE
PATIENT POSTTEST

For each statement below, please indicate your response by circling the number that most closely corresponds to your answer:

1 = True 2 = False 3 = Unsure

	True	False	Unsure
1. Women who have breastfed have a reduced risk of getting Type 2 Diabetes	1	2	3
2. Infants who have breastfed have a reduction in the incidence of developing Type 1 and Type 2 Diabetes	1	2	3
3. Colostrum is a mother's early milk, which contains antibodies to protect the newborn against disease	1	2	3
4. If a mother develops a sore, reddened, and swollen breast she should stop breastfeeding	1	2	3
5. Women who have breastfed have higher risk of breast cancer	1	2	3
6. If a mother feels she is not producing enough breast milk, she should supplement with formula	1	2	3
7. Proper latching involves getting the infant to latch onto the nipple and as much of the areola as possible	1	2	3
8. Infants who are breastfed are at increased risk of developing diarrhea	1	2	3
9. Human colostrum is sticky, thick, and yellowish in color	1	2	3
10. When a mother's breasts become engorged, she should discontinue breastfeeding for a couple days	1	2	3
11. Gently stroking an infant's check can elicit and infant's rooting reflex to turn towards the mother's breast with mouth wide open	1	2	3
12. Expressed breast milk can be kept refrigerated up to eight days	1	2	3
13. To avoid over-feeding, it is important to limit feedings at each breast to 5 minutes	1	2	3
14. Exclusively breastfed infants feed anywhere from 8 to 12 times a day	1	2	3

15. Is the information in the packet easy to understand? **Y N**

16. Do you feel that this packet is valuable for prenatal patients? **Y N**

17. What was your favorite part of this educational packet and presentation?

18. What would you change about this educational packet and presentation?

Appendix I:

Provider Pretest (modified BKQ)

BREASTFEEDING KNOWLEDGE QUESTIONNAIRE
PRETEST

1. Women who breastfeed have a reduced risk of getting:
   a. Alzheimer's disease
   b. Type 2 diabetes
   c. Asthma
   d. Type 1 diabetes

2. Infants who are breastfed have a reduction in the incidence of developing:
   a. Type 1 diabetes
   b. Hypothyroidism
   c. Type 2 diabetes
   d. Both a & c

3. What contains antibodies to protect the newborn against disease?
   a. Formula
   b. Sugar water
   c. Colostrum
   d. Rice cereal

4. What should a mother do if one breast becomes sore, red and swollen?
   a. Stop breastfeeding completely
   b. Stop breastfeeding & supplement with formula until it is cleared up
   c. Only breastfeed on the opposite side until it is cleared up
   d. Call your provider, but continue to breastfeed, even if they prescribe antibiotics

5. Women who have breastfed have a lower risk of which type of cancer?
   a. Breast
   b. Ovarian
   c. Uterine
   d. All of the above

6. What should a mother do if she feels that she is not producing enough breastmilk?
   a. Call and make an appointment for lactation help as soon as possible
   b. Stop breastfeeding and switch to formula
   c. Stop breastfeeding and start infant on solid foods
   d. Continue breastfeeding, but supplement all feedings with formula

7. Which is <u>not</u> part of obtaining a proper latch?
   a. Make sure baby's mouth is around your nipple and as much of the areola as possible
   b. Lips are flanged or rolled out
   c. Baby is on the tip of the nipple with their bottom lip sucked in
   d. Using a sandwich hold to help get a wide latch

BREASTFEEDING KNOWLEDGE QUESTIONNAIRE
PRETEST

8. Infants who are breastfed are at a decreased risk of:
   a. Intestinal infections
   b. Respiratory infections
   c. Urinary tract infections
   d. All of the above

9. What is not part of the consistency of colostrum?
   a. Yellow
   b. Sticky
   c. Thick
   d. Smelly

10. What should a mother not do if her breasts become engorged?
   a. Stop breastfeeding for a couple of days
   b. Manually express some milk before latching baby on
   c. Assess baby's latch, and adjust if needed
   d. Avoid tight-fitting bras or tops

11. How do you know if an infant is hungry?
   a. Gently stroke their cheek to assess for a rooting reflex
   b. Baby is putting their hand in their mouth and sucking on it
   c. Baby is sticking their tongue out or licking their lips
   d. All of the above

12. What is not true of freshly expressed breastmilk?
   a. It can last out at room temperature for up to 4 hours after expressing it
   b. It can last in a refrigerator for up to 4 days
   c. It must be consumed immediately, or be thrown away
   d. It can last in a freezer for up to 6 – 12 months

13. Which is true about breastfeeding?
   a. It is easy to overfeed a baby while breastfeeding
   b. You should limit feeding times to 5 minutes per breast
   c. Breastmilk composition changes as baby gets older
   d. Breastfeeding is more expensive than formula

14. How often do exclusively breastfed infants eat?
   a. 8-12 times per day
   b. 3 times a day
   c. Every hour
   d. Whenever they cry

Appendix J:

Provider Posttest (Modified BKQ with Evaluation Questions)

BREASTFEEDING KNOWLEDGE QUESTIONNAIRE
PROVIDER POSTTEST

1. Women who breastfeed have a reduced risk of getting:
   a. Alzheimer's disease
   b. Type 2 diabetes
   c. Asthma
   d. Type 1 diabetes

2. Infants who are breastfed have a reduction in the incidence of developing:
   a. Type 1 diabetes
   b. Hypothyroidism
   c. Type 2 diabetes
   d. Both a & c

3. What contains antibodies to protect the newborn against disease?
   a. Formula
   b. Sugar water
   c. Colostrum
   d. Rice cereal

4. What should a mother do if one breast becomes sore, red and swollen?
   a. Stop breastfeeding completely
   b. Stop breastfeeding & supplement with formula until it is cleared up
   c. Only breastfeed on the opposite side until it is cleared up
   d. Call your provider, but continue to breastfeed, even if they prescribe antibiotics

5. Women who have breastfed have a lower risk of which type of cancer?
   a. Breast
   b. Ovarian
   c. Uterine
   d. All of the above

6. What should a mother do if she feels that she is not producing enough breastmilk?
   a. Call and make an appointment for lactation help as soon as possible
   b. Stop breastfeeding and switch to formula
   c. Stop breastfeeding and start infant on solid foods
   d. Continue breastfeeding, but supplement all feedings with formula

7. Which is <u>not</u> part of obtaining a proper latch?
   a. Make sure baby's mouth is around your nipple and as much of the areola as possible
   b. Lips are flanged or rolled out
   c. Baby is on the tip of the nipple with their bottom lip sucked in
   d. Using a sandwich hold to help get a wide latch

BREASTFEEDING KNOWLEDGE QUESTIONNAIRE
PROVIDER POSTTEST

8. Infants who are breastfed are at a decreased risk of:
   a. Intestinal infections
   b. Respiratory infections
   c. Urinary tract infections
   d. All of the above

9. What is not part of the consistency of colostrum?
   a. Yellow
   b. Sticky
   c. Thick
   d. Smelly

10. What should a mother not do if her breasts become engorged?
   a. Stop breastfeeding for a couple of days
   b. Manually express some milk before latching baby on
   c. Assess baby's latch, and adjust if needed
   d. Avoid tight-fitting bras or tops

11. How do you know if an infant is hungry?
   a. Gently stroke their cheek to assess for a rooting reflex
   b. Baby is putting their hand in their mouth and sucking on it
   c. Baby is sticking their tongue out or licking their lips
   d. All of the above

12. What is not true of freshly expressed breastmilk?
   a. It can last out at room temperature for up to 4 hours after expressing it
   b. It can last in a refrigerator for up to 4 days
   c. It must be consumed immediately, or be thrown away
   d. It can last in a freezer for up to 6 – 12 months

13. Which is true about breastfeeding?
   a. It is easy to overfeed a baby while breastfeeding
   b. You should limit feeding times to 5 minutes per breast
   c. Breastmilk composition changes as baby gets older
   d. Breastfeeding is more expensive than formula

14. How often do exclusively breastfed infants eat?
   a. 8-12 times per day
   b. 3 times a day
   c. Every hour
   d. Whenever they cry

BREASTFEEDING KNOWLEDGE QUESTIONNAIRE
PROVIDER POSTTEST

15. Did you find this educational session valuable to you, as a prenatal care provider? **Y N**

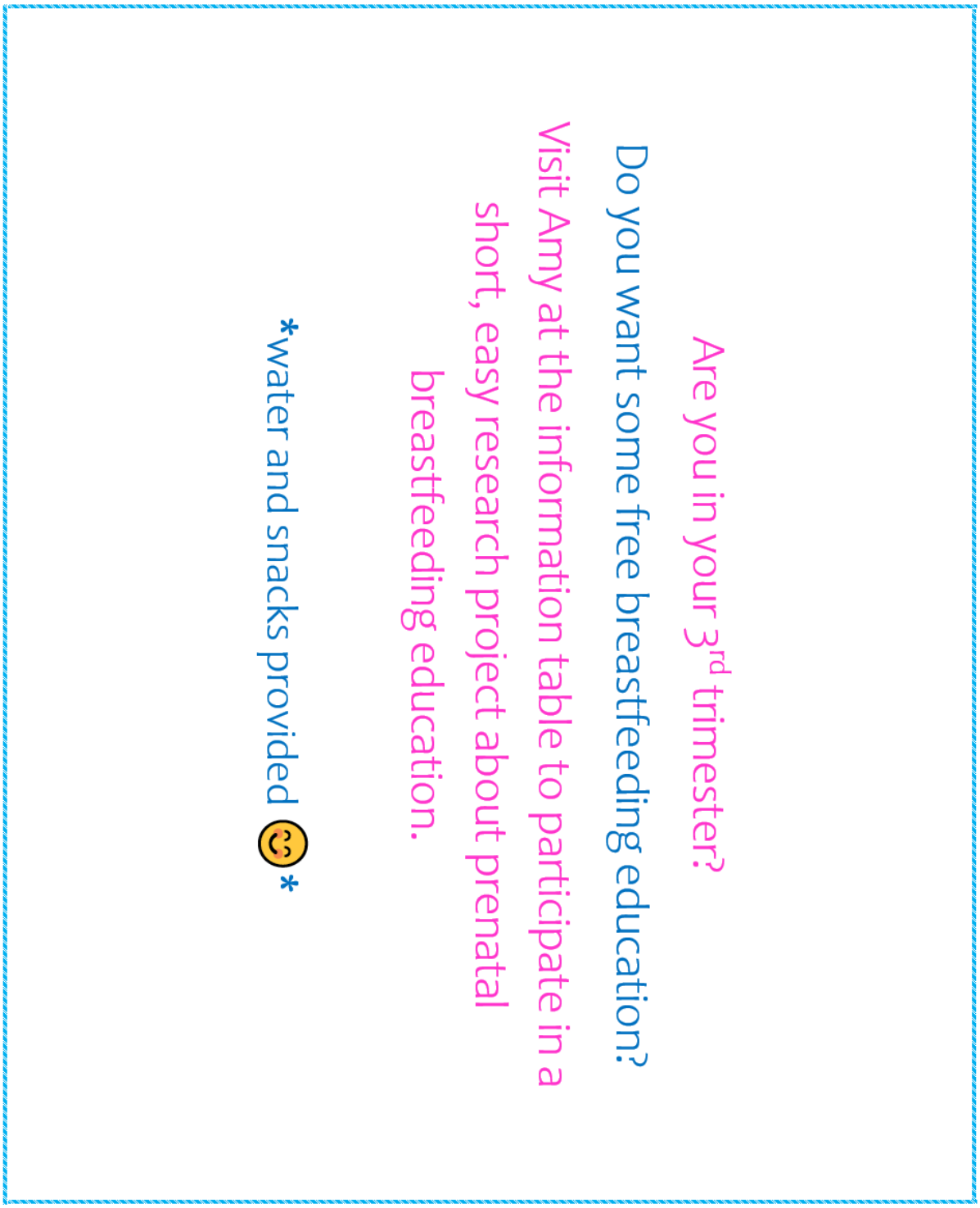
16. Do you feel that the educational packet is valuable for prenatal patients? **Y N**

17. What was your favorite part of this educational session?

18. What would you change about this educational session?

Appendix K:

Patient Recruitment Flyer



Appendix L:

Prenatal Breastfeeding Education Packet

Aloha!

Thank you for choosing to have your baby at North Hawai`i Community Hospital's Family Birthing Unit.

We are a Baby-Friendly designated facility, which means we promote early and exclusive breastfeeding. We help you achieve this with skin-to-skin contact as soon as possible after delivery, and initiating breastfeeding within the first hour. Our specially trained staff will assist you to be successful in your initial days feeding and bonding with your child. Our goal every day is to have happy and healthy mothers and babies.

This educational packet is provided to you, our soon-to-be-patient, to help give you baseline knowledge about breastfeeding, before you come see us when you are in labor.

Please continue to talk with your prenatal care provider about any questions or concerns that you have during your pregnancy, including breastfeeding.

You may also contact us at the Family Birthing Unit at any time for any questions about the unit practices, amenities, or to ask for a tour. Our phone number is (808)881-4771.

We hope you enjoy this prenatal, sneak-peak into breastfeeding basics, and we look forward to seeing you soon, and helping to bring your child into the world!

Aloha, and a hui ho!

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Other photos and information from: Lactation Education Resources. (2019). Retrieved from www.LactationTraining.com
Created by A. Hanapi, 2019

Why Breastfeed?

Breastfeeding is the best way to feed your newborn child, and give them the healthiest and most secure start to life. There are so many benefits to breastfeeding – for both babies and mothers – some immediate, and some for later in life… And, it's FREE!

Immediate benefits to baby include:

- Increases positive bonding with mom and gives babies a sense of wellbeing
- Colostrum is rich in antibodies that protect babies from getting sick
- It has every single thing a baby needs to be nourished, until they are at least 6 months old, and changes as your baby does or mom is exposed to an illness, so it is always customized to your child

Benefits for later include:

- A significantly lower risk of SIDS
- Lower rates of ear, respiratory, urinary, and gut infections
- Lower rates of asthma, Type 1 and 2 Diabetes, obesity, and certain leukemias

Immediate benefits to mom include:

- Decreased bleeding after delivery, with lower risk of postpartum hemorrhage
- Positive bonding and increased wellbeing
- Lower rate of postpartum depression
- Can help with weight loss after delivery

Benefits for later include:

- Helps to manage fertility and space out pregnancies
- Lower risk of breast, ovarian, and uterine cancer
- Lower risk of type 2 diabetes, heart disease, high cholesterol and high blood pressure

Clipart photos from: Clipart Library. Retrieved from: http://clipart-library.com/clipart/247254.htm and http://clipart-library.com/clipart/283478.htm
Other photos and information from: Lactation Education Resources. (2019). Retrieved from www.LactationTraining.com
Created by A. Hanapi, 2019

Common Breastfeeding Positions

FOOTBALL or CLUTCH HOLD

- Tuck the baby under your arm with pillow support
- Place baby at breast height
- Tuck pillow or rolled blanket under your wrist for support

Works well for all mothers, but is also ideal for after a C-section because there is no weight on mom's abdomen!

CROSS-CRADLE HOLD

- Place your hand behind baby's ears
- Roll baby to face you, belly-to-belly
- Other hand can support your breast
- Use pillows under one or both arms, or under baby's body, so they stay at breast height

Often preferred in the early days of breastfeeding, because you can have good control of baby's head!

SIDE-LYING

- Position baby at breast closest to bed
- Use pillow or blanket support behind your back, baby's back, and between your knees
- Roll baby towards you, belly-to-belly

Ideal position to rest, or to get off of a sore bottom!

CRADLE HOLD

- Cradle baby's head in your same-side arm
- Bring baby to breast height
- Roll baby to be belly-to-belly

This position is best once baby is nursing and latching easily, and isn't usually ideal in the beginning!

Clipart photos from: Clipart Library. Retrieved from: http://clipart-library.com/clipart/247254.htm and http://clipart-library.com/clipart/283478.htm
Other photos and information from: Lactation Education Resources. (2019). Retrieved from www.LactationTraining.com
Created by A. Hanapi, 2019

What is a Proper Latch?

- Lips flanged, or rolled out
- Mouth open 140 degrees
- Baby chin touching your breast
- Nose free
- Asymmetrical latch – more breast tissue from the bottom of your areola is in baby's mouth that from the top of your areola
- Wide jaw movements & consistent sucking
- Audible swallowing (when milk comes in)

You can try to use a "sandwich hold" to help get a wide and deep latch

- Support behind the areola and gently squeeze breast to form an oval shape
- Keep thumb near baby's nose, and other fingers on opposite side of breast
- Stroke nipple from baby's nose to chin, rolling out lower lip as you stroke down

What is a poor latch?

- Shallow attachment – baby has only the nipple, and no areola
- Face is far away from breast
- Lips not flanged – bottom lip is sucked under

Signs of a Good Latch	Signs of a Poor Latch
Deep, strong pulling sensation	Sharp pain
Consistent sucking with only brief pauses	Inconsistent sucking
Vigorous sucking	Weak sucking
Visible milk in baby's mouth	Mouth appears dry
Breasts feel softer or emptied after feeding	Engorgement
Baby is content & satisfied after feeding	Baby is not satisfied at the end of feeding
Adequate amount of wet and poopy diapers	Inadequate wet or poopy diapers
Appropriate weight loss in the first few days	Too much weight loss in the first few days

Clipart photos from: Clipart Library. Retrieved from: http://clipart-library.com/clipart/247254.htm and http://clipart-library.com/clipart/283478.htm
Other photos and information from: Lactation Education Resources. (2019). Retrieved from www.LactationTraining.com
Created by A. Hanapi, 2019

How to be a Successful Breastfeeder

Manual or Hand Expression:

Fingers in C-shape, around and behind areola

Press back towards the chest

Compress fingers together

Express milk, then relax and repeat

- You may massage your breast before or during, or apply light heat
- You may express a little colostrum to aid in getting baby to latch, or you can express more if your breasts are feeling very full or engorged
- Colostrum is yellow, thick and sticky… and full of nutrients and antibodies
- Catch and save every bit that you express… Don't waste a single drop!

Know Your Infant's Hunger Cues:

- Awakening
- Hand in mouth
- Crying – soft at first, then grows in intensity. *Crying is the last hunger cue!*
- Mouthing – sticking out tongue licking lips
- Rooting – turning head toward breast & opening mouth

Overcome Common Obstacles:

Some of the most common obstacles can be prevented, or resolved, with a consistent, proper latch, which then leads to better feedings:

- Nipples that are very sore
- Bleeding, cracked or blistered nipples
- Engorgement
- Jaundice
- Baby seems not content or satisfied after feeding
- Excessive infant weight loss
- Not enough dirty diapers

For red, swollen or painful area in the breast, call your provider. It may be mastitis & they may prescribe antibiotics, but you should continue breastfeeding, unless directed not to

REMEMBER: Breastfeeding is natural, but it is not innate. It is a learning experience for both mother and child. Don't be afraid or embarrassed to ask for help any time you need it, and take all the help and advice you can from trained experts and professionals!

Clipart photos from: Clipart Library. Retrieved from: http://clipart-library.com/clipart/247254.htm and http://clipart-library.com/clipart/283478.htm
Other photos and information from: Lactation Education Resources. (2019). Retrieved from www.LactationTraining.com
Created by A. Hanapi, 2019

Appendix M:

Letter of Support from NHCH Administration

NORTH HAWAI'I COMMUNITY HOSPITAL
AN AFFILIATE OF THE QUEEN'S HEALTH SYSTEMS

April 15, 2019

Human Studies Program
University of Hawaii
2425 Campus Road, Sinclair 1
Honolulu, HI 96822

To Whom It May Concern:

In my capacity of being the Assistant Administrator, Director of Nursing at North Hawaii Community Hospital (NHCH), I fully support Amy Hanapi's project to Improve Prenatal Breastfeeding Education in a Baby-Friendly Facility in Hawaii County. NHCH is excited and looking forward to the positive outcomes this project will have on our patients.

If you have any questions, feel free to call me at (808) 881-4705 or e-mail me at jstanforthzanoff@queens.org.

Sincerely,

Julie Stanforth Zanoff

Julie Stanforth Zanoff

67-1125 Mamalahoa Highway Kamuela, HI 96743 p 808.885.4444 f 808.881.4404 | www.NHCH.com

Appendix N:

UH IRB Approval as Exempt Project

UNIVERSITY of HAWAI'I® MĀNOA

Office of Research Compliance
Human Studies Program

DATE:	May 08, 2019
TO:	Shmina, Kimberly, DNP, University of Hawaii at Hilo, School of Nursing Hanapi, Amy, BSN, University of Hawaii at Hilo, School of Nursing
FROM:	Rivera, Victoria, Dir, Ofc of Rsch Compliance, Social&Behav Exempt
PROTOCOL TITLE:	Practice Inquiry Project Proposal: Improving Prenatal Breastfeeding Education in a Baby-Friendly Facility in Hawai`i County
FUNDING SOURCE:	
PROTOCOL NUMBER:	2019-00311
APPROVAL DATE:	May 08, 2019

NOTICE OF APPROVAL FOR HUMAN RESEARCH

This letter is your record of the Human Studies Program approval of this study as exempt.

On May 08, 2019, the University of Hawaii (UH) Human Studies Program approved this study as exempt from federal regulations pertaining to the protection of human research participants. The authority for the exemption applicable to your study is documented in the Code of Federal Regulations at 45 CFR 46.101(b) 2, 3.

Exempt studies are subject to the ethical principles articulated in The Belmont Report, found at the OHRP Website www.hhs.gov/ohrp/humansubjects/guidance/belmont.html.

Exempt studies do not require regular continuing review by the Human Studies Program. However, if you propose to modify your study, you must receive approval from the Human Studies Program prior to implementing any changes. You can submit your proposed changes via the UH eProtocol application. The Human Studies Program may review the exempt status at that time and request an application for approval as non-exempt research.

In order to protect the confidentiality of research participants, we encourage you to destroy private information which can be linked to the identities of individuals as soon as it is reasonable to do so. Signed consent forms, as applicable to your study, should be maintained for at least the duration of your project.

This approval does not expire. However, please notify the Human Studies Program when your study is complete. Upon notification, we will close our files pertaining to your study.

If you have any questions relating to the protection of human research participants, please contact the Human Studies Program by phone at 956-5007 or email uhirb@hawaii.edu. We wish you success in carrying out your research project.

UH Human Studies Program, Office of Research Compliance
Office of the Vice President for Research and Innovation, University of Hawai'i, System
2425 Campus Road, Sinclair 10, Honolulu HI 96822
Phone: 808.956.5007 • Email: uhirb@hawaii.edu
https://www.hawaii.edu/researchcompliance/human-studies
An Equal Opportunity & Affirmative Action Institution

Full Accreditation

Appendix O:

QMC RIRC Project Approval as "Not Human Subjects Research"

THE QUEEN'S MEDICAL CENTER

RESEARCH & INSTITUTIONAL REVIEW COMMITTEE
1301 Punchbowl Street, University Tower 5th Floor ▪ Honolulu, HI 96813
Ph: 808-691-4512 ▪ Fax: 808-691-7897 ▪ www.queens.org

May 21, 2019

Amy A. Hanapi, RN-C, BSN, DNP-student
ahanapi@queens.org
1 Kahoa Street
Hilo, Hawaii 96720

RE: Project Title: Practice Inquiry Project: Improving Breastfeeding Education in a Baby-Friendly Facility in Hawai`I County

Dear Ms. Hanapi,

Based on the above referenced documents received May 16, 2019, we have determined your project is not considered human subjects research. As stated in the Proposal document, this is Quality Improvement Project for your Doctor of Nursing Practice (DNP).

Should your project change, a re-evaluation will be necessary. Please contact Ms. Ohta at 808-691-4016 or rohta@queens.org or Ms. Lin-DeShetler at 808-691-7986 or dlindeshetler@queens.org.

Thank you.

Sincerely.

Michael Meagher, MD, FACR
Chairman, Research and Institutional Review Committee

Cc: file

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