

Impact of an Educational Intervention on Knowledge and Attitudes Concerning Maternity Care
Practices Consistent with the “Baby-Friendly Hospital Initiative”

Marjorie Young BSN, RNC, IBCLC, DNPs

October 12, 2014

Abstract

Objective: The purpose of this study is to examine if an educational intervention increases knowledge and positively influence attitudes in maternity care staff in regards to maternity care practices consistent with the Baby-Friendly Hospital Initiative (BFHI)?

Design: This study used a pretest-posttest quasi experimental design with the target population healthcare professionals in facilities which provide maternity care services.

Setting: The study participants consisted of 15 pediatricians, 13 obstetricians, 2 certified nurse midwives and 181 nurses. Included in the nurses' group were seven obstetric technicians for a total of 218 participants.

Methods: The pre and posttest knowledge/attitude survey tool was an investigator developed tool. The survey tool items were developed in accordance with the Baby-Friendly Hospital Initiative (BFHI) *Ten Steps to Successful Breastfeeding* which was created by the World Health Organization and UNICEF in 1989. Content validity of the survey tool was verified by expert staff from the BFHI. A paired-samples *t*-test using pre and posttest survey results was conducted on each individual survey item to evaluate the impact of the educational intervention on the understanding of and attitudes about maternity care practices consistent with the BFHI. The eta squared statistics were calculated for effect size.

Results: On the survey's 10 knowledge questions, the average pretest score was 69%. This increased to 91% following the staff training. On the Likert scale questions concerning attitude, pretest scores were 3.84, increasing to 4.32 following the intervention. This increase carries a $p < .000$, indicating a strongly significant increase in positive attitude toward BFHI maternity care

practices. A combined result of the 15 questions resulted in a $p < .05$ indicating statistical and a clinical significance with an overall Eta square of 0.19 indicating large effect size.

Conclusion: Findings indicate a significant impact on knowledge and attitude about BFHI consistent maternity care practices when healthcare staff is provided targeted education.

Keywords: Knowledge, attitude, breastfeeding, maternity care practices, and Baby-Friendly Hospital Initiative

Impact of an Educational Intervention on Knowledge and Attitude Concerning Maternity Care Practices Consistent with the “Baby-Friendly Hospital Initiative”

The debate is over; research has long made clear that breastfeeding is the optimal choice for mothers and their infants. In the Surgeon General’s Call to Action to Support Breastfeeding, Dr. Regina Benjamin states breastfeeding is “one of the most highly effective preventive measures a mother can take to protect the health of her infant and herself” (USDHHS, 2011, p.1). Leading medical authorities including the American Academy of Pediatrics (AAP), American College of Obstetrics and Gynecology (ACOG), American Academy of Family Practitioners (AAFP), World Health Organization (WHO), Centers for Disease Control and Prevention (CDC), and U. S. Department of Human and Health Services (DHHS), recommend that infants be exclusively breastfed for the first 6-months of life and continue breastfeeding for at least the first year of life (United States Breastfeeding Committee, USBC, 2009). The AAP policy statement provides strong evidence that breastfeeding decreases the incidence of a wide range of infections including respiratory and urinary tract infections, diarrhea, otitis media, and necrotizing enterocolitis. Human milk feedings also decrease the risk of childhood leukemia, SIDS, asthma, diabetes and obesity. Women who breastfeed have better maternal health outcomes with benefits including lower risk of ovarian and breast cancer and diabetes (AAP, 2012). As an economic benefit to society, the United States could save \$13 million a year in healthcare costs if 90% of women exclusively breastfed for the first six months of an infant’s life (Bartick & Reinhold, 2010).

One of the six major sectors of society affected by the Surgeon General’s Call to Action is the healthcare sector. According to the Healthy People 2020 objectives developed by the DHHS, which investigated barriers to breastfeeding, maternity care practices often present

obstacles to breastfeeding mothers. Dr. Benjamin encourages the health care system to utilize the Baby-Friendly Hospital Initiative (BFHI) as an evidence-based practice strategy to support breastfeeding (DHHS, 2011). The Baby-Friendly Hospital Initiative is a global initiative developed in 1989 by the World Health Organization (WHO) and the United Nations Children's Fund (UNICEF) to promote, protect and support breastfeeding. The Baby-Friendly Hospital Initiative is based on the *Ten Steps to Successful Breastfeeding* as an evidence based strategy to improve maternity care practices (Barnes, Cox, Doyle, & Reed, 2010). This steps include:

1. Have a written breastfeeding policy that is routinely communicated to all health care staff.
2. Train all health care staff in skills necessary to implement this policy.
3. Inform all pregnant women about the benefits and management of breastfeeding.
4. Help mother initiate breastfeeding within one hour of birth.
5. Show mothers how to breastfeed and how to maintain lactation, even if they are separated from their infants.
6. Give newborn infants no food or drink other than breastmilk, unless medically indicated.
7. Practice "rooming-in" allow mothers and infants to remain together 24 hours a day.
8. Encourage breastfeeding on demand.
9. Give no pacifiers or artificial nipples to breastfeeding infants.
10. Foster the establishment of breastfeeding support groups and refer mothers to them on discharge from the hospital or clinic. (BFHI, 2010)

The United States subsequently commenced a national initiative to assess maternity care practices that support breastfeeding. Beginning in 2007, the CDC conducted the first national survey known as the Maternity Practices in Infant Nutrition and Care (mPINC) survey (BFHI, 2010, & CDC, 2011). Components of maternity care and infant feeding best practices examined in the mPINC survey consisted of items such as immediate skin to skin contact of the newborn with the mother after delivery along with breastfeeding assistance from trained staff. The CDC analyzed the data to evaluate evidence-based steps to the best practices that support breastfeeding as outline in the BFHI Ten Steps to Successful Breastfeeding. In the 2011 mPINC survey, LewisGale Medical Center (LGMC) scored 66%: LewisGale Hospital Montgomery (LGHM) scored 88%, which is in the 90 percentile for the nation. Henrico Doctors' Hospital (HDH) did not participate in the survey. The score for Virginia is 67%, whereas the score for the U.S. is 70% (CDC, 2012). In the United States, six percent of births occur in hospitals that have been awarded the Baby-Friendly designation. These hospitals meet the standards set by the United Nations Children's Fund (UNICEF) and the World Health Organization (WHO) to provide an optimal level of breastfeeding care (CDC, 2012).

The Joint Commission developed new Perinatal Care Core Measures that became available in April of 2010. One of these Perinatal Care Core Measures is exclusive breast milk feeding which focuses on improving adherence to evidence-based practices reflected in the rates of exclusive breastfeeding (USBC, 2009). Since the release of the Joint Commission's Perinatal Core Measure goal for exclusive breastmilk feeding of 78% for hospitals, HCA has supported this goal of improving maternity care practices supporting the maternal choice of breastfeeding. Recent data from the CDC documents that 77% of new mothers initiate breastfeeding, but only 47% are breastfeeding at 6-months while 25% continue partial breastfeeding for one year (CDC,

2012). Healthy People 2020 set a new objective of 82 % of women initiating breastfeeding; with the goal of 61% exclusively breastfeeding at six months, and 34% continuing to breastfeed until at least one year of age (CDC, 2008). In addition, the U. S. Breastfeeding Committee has set a new Healthy People 2020 objective, addressing maternity care practices to reduce formula supplementation within the first 1-2 days of life. The CDC states that 19.4% of breastfed newborns receive formula supplementation in hospitals despite recommendations against routine supplementation (CDC, 2014). Along with late breastfeeding initiation, supplementation of the baby is one of the strongest risk factors for suboptimal breastfeeding duration (DiGirolamo, Grummer-Strawn, and Fein, 2008).

Considering the unequalled and unquestionable benefits of breastfeeding, we must heed the Surgeon General's Call to Action to support breastfeeding in the healthcare sector through improved maternity care practices. Building the knowledge base for research should be a priority with the goal of promoting, supporting, and protecting breastfeeding therefore improving the health of millions of women and their babies nationwide. This study will contribute to the body of research available on knowledge and attitude concerning maternity care practices consistent with the BFHI.

Literature Review

Search Strategy

An extensive systematic search was utilized to assess available research literature incorporating the years of 2001-2014. The following databases were utilized: CINAHL, Virginia Henderson International Nursing Library, PubMed, MEDLINE, and Cochrane Database of Systematic Reviews, MD Consult, National Guideline Clearinghouse, TRIP, and Google Scholar. Employing the keyword search terms of knowledge, attitude, Baby-Friendly Hospital

Initiative, breastfeeding, and maternity care practices, relevant original research and supportive literature was obtained. There were two goals of this literature review: to provide an overview of the existing evidence with subsequent critical appraisal to demonstrate the need for a new study. The literature illuminates several key factors which encourage further study. (see Appendix A for the Baby-Friendly Search for Evidence).

Lack of Knowledge on Breastfeeding Promoting Practice

Findings, thus far, suggest that there is a general lack of knowledge in healthcare providers concerning maternity care practices that would promote, protect and support breastfeeding. This noted lack of awareness of the best breastfeeding maternity care practices is a major barrier to proper and successful breastfeeding. (Barnes, et al. 2010; Bernaix, Beaman, Schmidt, Harris, & Miller, 2010; Daniels & Jackson, 2011; Ingram, Johnson, & Condon, 2011; Merewood, & Phillips, 2001; Myers, 2013; Okolo & Ogbonna, 2002; Siddell, Marinelli, Froman, & Burke, 2003; Taylor, Gribble, Sheehan, Schmied, & Dykes, 2011; Walsh, Pincombe, & Henderson, 2010; Zararija-Grkovic, 2010). In 2009, the CDC's national survey related to Maternity Practices in Infant Nutrition and Care (mPINC), less than 1% of US hospitals have implemented all 10 of the policies and practices set forth by the BFHI's Ten steps, due to lack of knowledge and practice barriers, (CDC;MMWR, 2011).

There are several original research studies that investigate the knowledge, attitudes, and practices of healthcare providers regarding maternity care practices that support breastfeeding (see Appendix B, Baby-Friendly Literature Review Results Table). Many of the studies utilize the principles set forth in the Ten Steps to Successful Breastfeeding (BFHI, 2010) to evaluate knowledge, attitude, and practices. Noted in ten research studies that had the specific criteria of knowledge, attitude, and practices related to breastfeeding/BFHI, were various research designs,

such as the quasi-experimental pretest/posttest design, cross sectional descriptive surveys, and qualitative interviews (Bernaix et al, 2010; Daniels & Jackson, 2011; Ingram et al. 2011; Myers, 2013; Okolo & Ogbonna, 2002; Ouyang, et al. 2012; Siddell et al. 2003; Taylor et al. 2011; & Walsh et al. 2010; Zakarija-Grhovic, 2010). (See Appendix C for a Literature Review Methodologic Matrix). Very few of the studies had a conceptual or theoretical framework on which to base the study. Bernaix, Beaman, Schmidt, Harris, & Miller (2010) based their research study on the theory of reasoned action which suggests that a persons' knowledge affects their attitudes and beliefs, therefore their behavior. Some of the studies had small sample size (Daniels, & Jackson, 2011; Taylor et al. 2011; Siddell et al. 2003), while others, only looked at nurses knowledge and attitudes (Bernaix et al, 2010; Daniels & Jackson, 2011; Ingram et al. 2011; & Siddell et al. 2003). Excluded from these studies were physicians, advanced practice nurses, and ancillary staff members. It is well known that it takes a collaborative healthcare team to be effective for knowledge and attitude change to result in changes in maternity care practices.

BFHI Effect on Breastfeeding Promoting Practice

There is strong evidence that the implementation of the BFHI utilizing the best practice strategies outlined in the Ten Steps to Successful Breastfeeding is associated with an increased rate of breastfeeding that is statistically significant (Abrahams & Labbok, 2009; Barnes et al., 2010; Chalmers et al., 2009; Dall'Oglio et al, 2007; Gau, 2004; Hannula, Kaunonen, & Marja-Terttu, 2008; Merewood et al., 2007; & Phillips et al. 2001). In a national Canadian survey by Chalmers et al. (2009), the researchers assert that though Canada has a high breastfeeding rate improvements are needed in maternity care practices espoused in the BFHI Ten Steps to increase duration and exclusivity of breastfeeding. Authors have noted that the practices of BFHI

increase breastfeeding rates, yet it is also noted that hospital practices have a great effect on breastfeeding success or failure (Hannula, et al. 2008).

In a landmark study by DiGiralamo, Grummer-Strawn, and Fein, (2008), the researchers note that in the US, only eight percent of mothers experienced six of the Ten Steps to Successful Breastfeeding as outlined in the BFHI. Mothers that did not experience any of the ten steps were thirteen times more likely to quit breastfeeding earlier than intended. Researchers Weddig, Baker, and Auld (2011) conclude that hospital policy and lack of nursing knowledge of best practices, such as demonstrated with BFHI, present significant barriers to support breastfeeding. Other barriers noted by researchers are staffing shortages, heavy workloads, lack of resources, implementation difficulty, staff knowledge and attitudes toward practices that support breastfeeding (Daniels & Jackson, 2011; Taylor, et al., 2010; Walsh, et al., 2011).

Ten Steps Education and its Effects

Previous researchers have found that staff education on breastfeeding utilizing the Ten Steps of Successful Breastfeeding as a best practice strategy demonstrates increased knowledge and improved attitudes (Bernaix et al, 2010; Ingram et al. 2011; Okolo & Ogbonna, 2002; Ouyang, et al. 2012; Siddell et al. 2003; Taylor et al. 2011; Zakarija-Grhovic, 2010). Researchers Ingram, Johnson, and Condon (2011) found that the response to the educational training from the participants was overwhelmingly positive and extremely worthwhile. It was noted in a longitudinal study that not only does educational intervention improve breastfeeding knowledge and attitude but it also increases breastfeeding initiation rates and duration (Gau, 2003).

Limitation of Previous Research

The BFHI Ten Steps of Successful Breastfeeding are multidisciplinary in focus. Only a few studies included nurses, physicians, and ancillary staff to evaluate their knowledge, attitude, and practices in relation to breastfeeding (Myers, 2013; Okolo & Ogbonna, 2002; Ouyang, et al. 2012). Nursing staff alone cannot effectively implement the BFHI. It takes a multidisciplinary team to be successful in promoting, protecting and supporting breastfeeding. Anne Merewood, a leading authority on implementation of the BFHI, asserts that it takes “rigorous staff education at all levels” (Merewood, & Phillips, 2001, p 38).

With the recognized importance of increasing breastfeeding rates as a national health initiative, combined with the lack of knowledge and positive attitudes toward maternity care practices that support breastfeeding as evidenced by the BFHI, additional research studies on this topic are an imperative. Although there is a body of research on breastfeeding and its’ barriers, there continues to be significant gaps in applicable evidence-based research. Due to the gaps in the literature with generalizability to all healthcare staff, and the importance of breastfeeding, it illuminates the need for additional studies.

Method

Research Question

Will educational intervention increase knowledge and positively influence attitudes in maternity healthcare professionals, in regards to maternity care practices related to the Baby-Friendly Hospital Initiative (BFHI)? For the purpose of this study, registered nurses, obstetrical technicians/unit secretaries/birth registrar, lactation consultants, and attending obstetricians, pediatricians, and certified nurse midwives/nurse practitioners, will be referred to as maternity healthcare professionals. This intervention serves as a foundational step in preparing Hospital

Corporation of American (HCA) hospitals for the journey toward BFHI designation. The BFHI is a prestigious designation that few hospitals are able to obtain. The BFHI designation is a mark of excellence in evidence-based, maternity care practices that demonstrate optimal infant feeding outcomes. The “4-D Pathway in the BFHI outlines a pathway to evaluate current hospital practice against best practice guidelines established in the “Ten Steps to Successful Breastfeeding”. The “4-D Pathway” to Baby-Friendly designation, includes the discovery, development, dissemination, and designation phase. (see Figure 1) This study aligns HCA facilities with the discovery phase in the 4-D Pathway (BFHI, 2010). The goal of this research is for maternity healthcare professionals to increase in knowledge and attitudes concerning maternity care practices that are consistent with the Baby-Friendly Hospital Initiative, resulting in the outcome of improved care that affects the success of the breastfeeding couplets.



Figure 1. (BFHI, 2010)

Theoretical Framework

This study used the theoretical framework by nursing theorist Imogene King. The Goal Attainment Theory guided the development of the educational intervention. The Theory of Goal Attainment is based on the process of human interactions. Major interrelated concepts of the theory include: communication, growth and development, interaction, perception, role, space, stress, time and transactions, (King, 1981). Each component of the educational intervention corresponded to a goal of changing knowledge and improving attitudes in relation to maternity care practices consistent with the BFHI. The concepts of Dr. King’s theory of interaction, transaction, and communication of participants meld well into an educational intervention. As the researcher communicates the educational interventions, the participants interact, then transaction occurs by gaining knowledge of the precept to mutually attain goals of increasing knowledge and positively influencing attitude. A critical variable to the theory is mutual goal setting which achieves goals leading to positive outcomes, providing data to support evidence based practice and research. Per Dr. King, nursing is a science and the relationship between theory and research is a way to build scientific knowledge (King, 1981).

See Figure 2 (King, 1981)

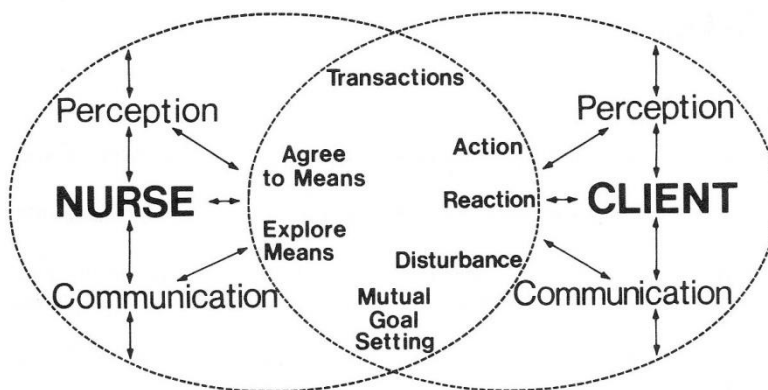


Figure 5.3 Schematic diagram of a theory of goal attainment.

Research Design

The target population for this research was maternity healthcare professionals in facilities that provide maternity care services. The accessible study population in this multi-site research project was a convenience sample which consisted of staff from HCA affiliated hospitals, including LewisGale Medical Center's (LGMC) Maternity Care Center, LewisGale Hospital Montgomery's Birthing Center, and Henrico Doctors' Hospital Women's Pavilion. Participants included registered nurses, obstetrical technicians/unit secretaries/birth registrar, lactation consultants, and attending obstetricians, pediatricians, and certified nurse midwives/nurse practitioners. The accessible population in its entirety (all maternity care staff) was invited to participate in this study. Recruitment notices and electronic communications were provided to all staff at each facility. This study used a pretest-posttest quasi-experimental design.

All subjects used their 3-4 ID for identification for the pairing of pretest-posttest knowledge survey results. The 3-4 ID is an HCA specific number/letter combination used as an employee specific identification. The investigator-developed survey consists of 10 multiple choice and true/false knowledge questions based on the "Ten Steps of Successful Breastfeeding". The ten items were analyzed together for the sum score of knowledge increase. Additionally five Likert type scale attitudinal items were included on the pretest-posttest knowledge survey (see Appendix G). A sum score for attitude was calculated with the potential of a score of 5-to-25.

Subjects participated in 30 minute multi-media educational training during in-services, staff meetings and medical committee meetings. Internal validity was strengthened by intervention fidelity as the educational training based on the "Ten Steps of Successful Breastfeeding" in the BFHI was provided by specifically trained International Board Certified Lactation Consultants (IBCLC). The three IBCLC's utilized the same PowerPoint presentation

and talking points at each facility for reliability and consistency of information. The educational intervention covered the following items:

- What is BFHI
- Explain Ten Steps to Successful Breastfeeding
 1. Have a written breastfeeding policy that is routinely communicated to all health care staff.
 2. Train all health care staff in skills necessary to implement this policy.
 3. Inform all pregnant women about the benefits and management of breastfeeding.
 4. Help mothers initiate breastfeeding within one hour of birth.
 5. Show mothers how to breastfeed and how to maintain lactation, even if they are separated from their infants.
 6. Give newborn infants no food or drink other than breastmilk, unless medically indicated.
 7. Practice “rooming in”—allow mothers and infants to remain together 24 hours a day.
 8. Encourage breastfeeding on demand
 9. Give no pacifiers or artificial nipples to breastfeeding infants.
 10. Foster the establishment of breastfeeding support groups and refer mothers to them on discharge for the hospital or clinic. (BFHI, 2010)
- Current gap analysis of LGMC, LGHM, and HDH versus nationwide maternity care practices, utilizing the CDC mPINC scores and Joint Commission Perinatal Care Core Measure score of Exclusive Breastmilk Feeding.
- Benefits of BFHI

Protection of Human Subjects

Prior to conducting the study, Institutional Review Board approval was obtained for LewisGale Hospital Montgomery, LewisGale Medical Center along with an affiliate agreement

for Henrico Doctors' Hospital with collaborative approval by LewisGale Regional Health System. Radford University also has an affiliate agreement with LewisGale Regional Health System. (see Appendix D, E, and F). This subject matter did not involve vulnerable subjects with sensitive information. Confidentiality was maintained since only statistical data using non-discoverable pretest-posttest knowledge and attitudinal surveys were used in this study. There was minimal risk of harm from the collected data. The IRB approved a waived signed consent as this was the primary risk of subject identification. Informed consent information was provided by the primary investigators. Time for questions was allowed, and subjects were given the opportunity to provide consent signature if desired. A copy of the consent was provided to the subjects (see Appendix H). The 3-4 ID identification numbers were not identifiable by anyone other than Human Resource personnel in each of the facilities, who did not participate in the study. No code sheet of 3-4 IDs was maintained. Data was entered into the SPSS IBM 19 software without participant identifiers. Data and any collected consents will be stored in a locked cabinet, in a locked office at LewisGale Hospital Montgomery for a minimum of five years, then will be destroyed.

Data Collection

The pretest-posttest knowledge survey tool was an investigator developed tool as there is not a tool available in the literature. The survey tool items were developed from the Baby Friendly Hospital Initiative "Ten Steps to Successful Breastfeeding", which was developed by the World Health Organization and UNICEF in 1989 (BFHI, 2010). Content validity of the tool was verified by the expert staff from the Baby-Friendly USA in March 2011. A trail run of the educational intervention was completed with cross-trained Birthing Center staff to verify the training process, testing the validity and reliability of the survey tool. The survey tool

demonstrated high internal consistency. Study participants retook the same knowledge/attitude survey as a posttest.

Budget

A budget for the study expenses is submitted as Appendix I.

Data Analysis

The pre and posttests were paired using the participants 3-4 ID to allow analysis of the retention of information taught and changes in attitudes. Data was entered and analyzed utilizing the IBM SPSS Statistics version 19, with descriptive statistics and paired-sample t-tests used to summarize the data. The mean scores, standard deviation, with a 95% confidence interval, and level of significance as pre-established as $p < 0.05$, along with eta squared, Cohen's d for statistical power and Cronbach's alpha were calculated. The data were used to compare the before and after educational intervention to determine if there was a statistically significant change in knowledge and attitude in maternity care practices in relation to the Baby-Friendly Hospital Initiative. The data were analyzed for each facility separately then combined for overall results for a multisite study.

Results

Population Demographics

The quantitative results from the three facilities; LGMC, LGHM, and HDH concerning the BFHI study are reported herein. The accessible study population consists of LewisGale Medical Center Maternity Care Center, LewisGale Hospital Montgomery Birthing Center, and Henrico Doctors Hospital Women's Pavilion staff. The variables related to this research question are the population demographics of age, level of education, and years of experience.

The study participants consisted of 15 pediatricians, 13 obstetricians, 2 CNM/NP, 181 nurses, and 7 obstetrical technician/unit secretary/birth registrar (See table 1).

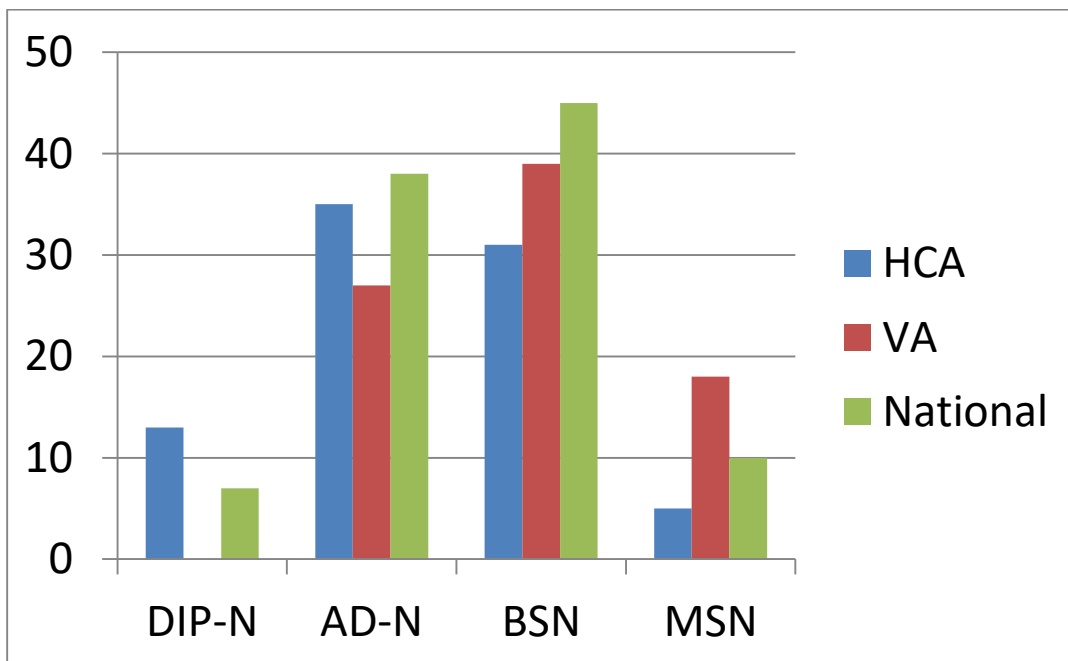
Table 1

Healthcare Provider Demographics

Health Care Providers	Number
Obstetricians	13
Pediatricians	15
CNM/NP	2
Nurses	181
OB Technicians	7
Total # Participants	218

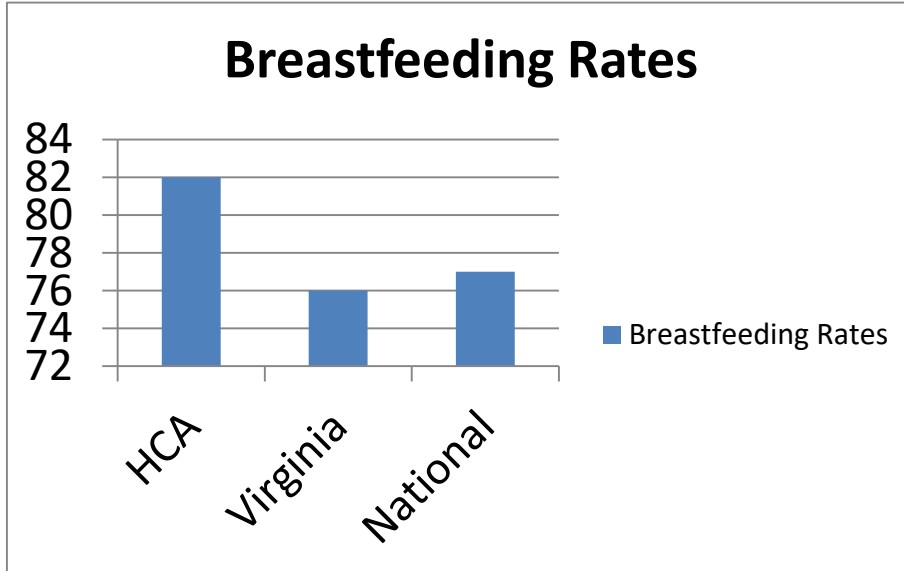
The participants' age ranged from 21 to >60 years with a mean age for the nursing staff of 44.6-years, which is comparable with the Virginia (VA) nurses with a mean age of 47 and the United States mean age of 44.6 (Health Work Force, 2013). The obstetrical technicians have some post-high school education, 13% of HCA of maternity care RN's have a diploma degree in nursing (7% US), 35% possess an associate's degree (AD) in nursing (27% VA, 37.9% US), while 31% had a BSN (38% VA, 44.6% US) and 5% had a MSN (18 %VA, 10% US), (DHHS, Health Work Force, 2013, & VDH, 2010). See Figure 1.

Figure 1. Nurse Education Demographics (%)



The categories for years of experience ranged from 1-3 years to greater than 20-years of experience, with 31% of participants having greater than 20-years of experience. Additional data to consider are the breastfeeding rates at LGMC and LGHM, the State of Virginia, and National related to the Ten Steps of Successful Breastfeeding in the Baby Friendly Hospital Initiative (see Figure 2). The breastfeeding rates at these HCA facilities far exceed the National and State rates.

Figure 2. Breastfeeding Rate (%)



A paired-samples t-test using pre and posttest survey results was conducted on individual survey items evaluating the impact of the educational intervention on the understanding of and attitudes about maternity care practices consistent with the BFHI. The mean scores, standard deviation, 95% confidence interval, level of significance, pre-established as $p < 0.05$ and eta squared for each survey item are reported in Table 1. The Cronbach's alpha was 0.76 for the reliability estimating internal consistency.

Table 1
Paired Samples t-test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Pre_MC1 - Post_MC1	-.29630	.55839	.03799	-.37118	-.22141	-7.799	215	.000
Pair 2	Pre_MC2 - Post_MC2	-.65138	.47763	.03235	-.71514	-.58762	-20.136	217	.000
Pair 3	Pre_MC3 - Post_MC3	-.05963	.28980	.01963	-.09832	-.02095	-3.038	217	.003
Pair 4	Pre_MC4 - Post_MC4	-.23394	.81197	.05499	-.34234	-.12555	-4.254	217	.000
Pair 5	Pre_MC5 - Post_MC5	-.61468	.51535	.03490	-.68347	-.54588	-17.610	217	.000
Pair 6	Pre_TF1 - Post_TF1	-.02765	.16435	.01116	-.04964	-.00566	-2.478	216	.014
Pair 7	Pre_TF2 - Post_TF2	-.00922	.31901	.02166	-.05190	.03347	-.426	216	.671
Pair 8	Pre_TF3 - Post_TF3	-.01382	.11703	.00794	-.02948	.00183	-1.740	216	.083
Pair 9	Pre_TF4 - Post_TF4	-.10648	.35142	.02391	-.15361	-.05935	-4.453	215	.000
Pair 10	Pre_TF5 - Post_TF5	-.13426	.50627	.03445	-.20216	-.06636	-3.898	215	.000
Pair 11	Pre_A1 - Post_A1	-.56744	.88806	.06057	-.68682	-.44806	-9.369	214	.000
Pair 12	Pre_A2 - Post_A2	-.37209	.88136	.06011	-.49057	-.25361	-6.190	214	.000
Pair 13	Pre_A3 - Post_A3	-.27103	.82871	.05665	-.38269	-.15936	-4.784	213	.000
Pair 14	Pre_A4 - Post_A4	-.87383	1.17004	.07998	-1.03149	-.71617	-10.925	213	.000
Pair 15	Pre_A5 - Post_A5	-.35981	.87558	.05985	-.47779	-.24183	-6.012	213	.000

Paired 1 Results

A paired samples t-test was conducted to evaluate the impact of the educational intervention on subject scores in relation to knowledge of maternity care practices consistent with the BFHI. In multiple choice question 1, “The Baby Friendly Hospital Initiative (BFHI) is” there was a statistically significant increase in scores from pretest ($M=.481$, $SD=.500$) to posttest scores ($M=.778$, $SD=.416$), $t(215) = -7.799$, $p < .000$ (two-tailed). The mean increase in pretest-posttest scores was $-.296$ with a 95% confidence interval ranging from $-.371$ to $-.221$. The eta squared statistic (0.22) indicated a large effect size.

Paired 2 Results

A paired samples t-test was conducted to evaluate the impact of the educational intervention on subject scores in relation to knowledge of maternity care practices consistent with the BFHI. In multiple choice question 2, “How many Virginia hospitals are currently designated as Baby-Friendly” there was a statistically significant increase in scores from pretest ($M=.321$, $SD=.468$) to posttest scores ($M=.973$, $SD=.164$), $t(217) = -20.14$, $P < .000$ (two-tailed). The mean increase in pretest-posttest scores was $-.651$ with a 95% confidence interval ranging from $-.715$ to $-.587$. The eta squared statistic (0.65) indicated a large effect size.

Paired 3 Results

A paired samples t-test was conducted to evaluate the impact of the educational intervention on subject scores in relation to knowledge of maternity care practices consistent with the BFHI. In multiple choice question 3, “Which of the following IS NOT one of BFHI’s “Ten Steps to Successful Breastfeeding” there was not a statistically significant increase in scores from pretest ($M=.913$, $SD=.283$) to posttest scores ($M=.972$, $SD=.164$), $t(217) = -3.04$, $P < .003$ (two-tailed). The mean in pretest-posttest score was $-.059$ with a 95% confidence

interval ranging from -.098 to -.021. The eta squared statistic (0.04) indicated a small to moderate effect size.

Paired 4 Results

A paired samples t-test was conducted to evaluate the impact of the educational intervention on subject scores in relation to knowledge of maternity care practices consistent with the BFHI. In multiple choice question 4, “Which of the following IS one of BFHI’s “Ten Steps to Successful Breastfeeding” there was a statistically significant increase in scores from pretest (M=.688, SD=.464) to posttest scores (M=.922, SD=.761), $t(217) = -4.25$, $p < .000$ (two-tailed). The mean increase in pretest-posttest scores was -.234 with a 95% confidence interval ranging from -.342 to -.126. The eta squared statistic (0.08) indicated a moderate effect size.

Paired 5 Results

A paired samples t-test was conducted to evaluate the impact of the educational intervention on subject scores in relation to knowledge of maternity care practices consistent with the BFHI. In multiple choice question 5, “In a federally sponsored survey of more than two-thousand women, what percentage of mothers experienced at least five of the ‘Ten Steps of Successful Breastfeeding’ during their maternity experience” there was a statistically significant increase in scores from pretest (M=.206, SD=.406) to posttest scores (M= .821, SD=.384), $t(217) = -17.61$, $P < .000$ (two-tailed). The mean increase in pretest-posttest scores was -.615 with a 95% confidence interval ranging from -.683 to -.545. The eta squared statistic (0.59) indicated a large effect size.

Paired 6 Results

A paired samples t-test was conducted to evaluate the impact of the educational intervention on subject scores in relation to knowledge of maternity care practices consistent

with the BFHI. On true/false question 1, “BFHI requires that hospitals have a written breastfeeding policy that is routinely communicated to all health care staff” there was not a statistically significant increase in scores from pretest ($M = .968$, $SD = .177$) to posttest scores ($M = .995$, $SD = .068$), $t(216) = -2.48$, $p < .014$ (two-tailed). The mean pretest-posttest score was $-.027$ with a 95% confidence interval ranging from $-.050$ to $.006$. The eta squared statistic (0.03) indicated small effect size.

Paired 7 Results

A paired samples t-test was conducted to evaluate the impact of the educational intervention on subject scores in relation to knowledge of maternity care practices consistent with the BFHI. On true/false question 2, “In order to be designated as Baby Friendly, only the nurses who work with breastfeeding patients need to receive specific breastfeeding education” the scores remained the same from pretest ($M = .922$, $SD = .269$) to posttest scores ($M = .931$, $SD = .254$), $t(216) = -.426$, $p < .671$ (two-tailed). The mean pretest-posttest score was $-.009$ with a 95% confidence interval ranging from $-.051$ to $.033$. The eta squared statistic (0.00) indicated small effect size.

Paired 8 Results

A paired samples t-test was conducted to evaluate the impact of the educational intervention on subject scores in relation to knowledge of maternity care practices consistent with the BFHI. On true/false question 3, “The more of the ‘Ten Steps’ a mother experiences, the greater her likelihood of continuing breastfeeding at and beyond 6 weeks postpartum” there was not a statistical difference from pretest ($M = .982$, $SD = .135$) to posttest scores ($M = .995$, $SD = .067$), $t(216) = -1.74$, $p < .083$ (two-tailed). The mean increase in pretest-posttest scores was

-.014 with a 95% confidence interval ranging from -.029 to .002. The eta squared statistic (0.01) indicated a small effect size.

Paired 9 Results

A paired samples t-test was conducted to evaluate the impact of the educational intervention on subject scores in relation to knowledge of maternity care practices consistent with the BFHI. On true/false question number 4, “One of the strongest risk factors for early breastfeeding termination is supplementation of the baby” there was not a statistically significant increase in scores from pretest (M=.870 SD =.337) to posttest scores (M=.978, SD=.150), $t(215) = -3.90$, $p < .000$ (two-tailed). The mean increase in pretest-posttest scores was -.106 with a 95% confidence interval ranging from -.154 to .059. The eta squared statistic (0.08) indicated a moderate effect size.

Paired 10 Results

A paired samples t-test was conducted to evaluate the impact of the educational intervention on subject scores in relation to knowledge of maternity care practices consistent with the BFHI. On true/false question 5, “BFHI has been shown to increase the duration of exclusive breastfeeding, but not breastfeeding rates” there was a statistically significant increase in scores from pretest (M=.574, SD =.496) to posttest scores (M=.708, SD=.456), $t(215) = -3.90$, $p < .000$ (two-tailed). The mean increase in pretest-posttest scores was -.134 with a 95% confidence interval ranging from -.202 to -.066. The eta squared statistic (0.07) indicated a moderate effect size.

Paired 11 Results

A paired samples t-test was conducted to evaluate the impact of the educational intervention on subject scores in relation to attitude toward maternity care practices consistent with the BFHI. On the Likert type attitude question 1, “A woman’s decision about whether to breastfeed is influenced by health care professionals” there was a statistically significant increase in scores from pretest ($M=3.77$, $SD=1.04$) to posttest scores ($M=4.33$, $SD=.871$), $t(214) = -9.37$, $p<.000$ (two-tailed). The mean increase in pretest-posttest scores was $-.567$ with a 95% confidence interval ranging from $-.687$ to $-.448$. The eta squared statistic (0.29) indicated a large effect size.

Paired 12 Results

A paired samples t-test was conducted to evaluate the impact of the educational intervention on subject scores in relation to attitude toward maternity care practices consistent with the BFHI. On the Likert type attitude question 2, “Hospital practices have a significant effect on breastfeeding success” there was a statistically significant increase in scores from pretest ($M=4.05$, $SD=.923$) to posttest scores ($M=4.42$, $SD=.816$), $t(214) = -6.19$, $p<.000$ (two-tailed). The mean increase in pretest-posttest scores was $-.372$ with a 95% confidence interval ranging from $-.490$ to $-.254$. The eta squared statistic (0.15) indicated a large effect size.

Paired 13 Results

A paired samples t-test was conducted to evaluate the impact of the educational intervention on subject scores in relation to attitude toward maternity care practices consistent with the BFHI. On the Likert type attitude question 3, “Increasing the rate and duration of breastfeeding is an important goal for health promotion” there was a statistically significant increase in scores from pretest ($M=4.25$, $SD=.950$) to posttest scores ($M=4.52$, $SD=.803$), t

(213) = -4.78, $p < .000$ (two-tailed). The mean increase in pretest-posttest scores was -.271 with a 95% confidence interval ranging from -.382 to -.159. The eta squared statistic (0.10) indicated a moderate effect size.

Paired 14 Results

A paired samples t-test was conducted to evaluate the impact of the educational intervention on subject scores in relation to attitude toward maternity care practices consistent with the BFHI. On the Likert type attitude question 4, “Accepting free promotional formula is a conflict of interest for health care facilities and providers” there was a statistically significant increase in scores from pretest (M=3.05, SD =1.23) to posttest scores (M=3.92, SD=1.16), $t(213) = -10.93$, $p < .000$ (two-tailed). The mean increase in pretest-posttest scores was -.834 with a 95% confidence interval ranging from -1.03 to -.716. The eta squared statistic (0.36) indicated a large effect size.

Paired 15 Results

A paired samples t-test was conducted to evaluate the impact of the educational intervention on subject scores in relation to attitude toward maternity care practices consistent with the BFHI. On the Likert type attitude question 5, “Being a ‘Baby-Friendly’ designated hospital is evidence of a strong commitment to excellent patient care” there was a statistically significant increase in scores pretest (M=4.07, SD =.979) to posttest scores (M=4.43, SD=.857), $t(213) = -6.01$, $p < .000$ (two-tailed). The mean increase in pretest-posttest scores was -.360 with a 95% confidence interval ranging from -.478 to -.242. The eta squared statistic (0.15) indicated a large effect size.

Summation of Findings

The statistical power for a two tailed hypothesis was established with a Cohen's *d* of 0.937 for a large effect size when comparing the pre and posttest mean. The sample population was achieved exceeding the pre-established Cohen's *d* of 0.8. On the survey's 10 knowledge questions, the average overall pretest score was 69%. This increased to 91% following the staff training. Further analysis demonstrated that one of the ten questions did not meet criteria for statistical significance when calculated separately. On questions 3, 6, 7, 8, and 9, the percentage correct was high on both pretests and posttests indicating either foreknowledge or a simplistic question. The remaining 5 questions demonstrated strong statistical significance with a combined mean $p < .000$ indicating the effectiveness of training on the participant's knowledge.

On the Likert scale questions concerning attitude with 1 representing strongly disagree and 5 representing strongly agree, the pretest mean score was 3.84, increasing to 4.32 following the intervention. This increase carries a $p < .000$, indicating a strongly significant increase in positive attitude toward BFHI maternity care practices. A combined result of the 15 questions resulted in a $p < .05$ indicating statistical significance and a clinical significance of an overall Eta square of 0.19 indicating large effect size.

Discussion

This multisite study is particularly important as it is the first study, to our knowledge, that evaluates an educational intervention on knowledge and attitudes of healthcare professionals concerning maternity care practices that are consistent with the BFHI in America. Although the age and level of education of participants is noteworthy, concerning is the lack of knowledge of best practice strategies for breastfeeding (pretest 69%). If these results were on a test in a

university, it would be a failing score. This lack of knowledge can negatively impact breastfeeding mothers. Also concerning was the significant barrier of resistance and poor attitude demonstrated by some physicians and nurses. This again signals the effectiveness of educational intervention when these attitudes can be improved.

This study provides evidence that reinforces previously published research that demonstrates the impact of educational interventions on the understanding and acceptance of BFHI maternity care practices. Findings support a statistically significant increase in knowledge and attitude improvement following the educational intervention.

Imogene King's Theory of Goal Attainment has guided this study (King, 1981). The Goal Attainment Theory supports the mutual goals of breastfeeding mothers, healthcare professionals and hospital facilities to attain success in breastfeeding, provide best practice in maternity care and meet Joint Commission Perinatal Core Measures along with the CDC's nationally published mPINC scores.

Strengths and Limitations of the Study

Internal validity of the study was strengthened due to the low attrition rate of 5.2%. Also strengthening the internal validity was the intervention fidelity by utilizing specifically trained Lactation Consultants to provide the educational intervention. The survey tool demonstrated high internal consistency due to the homogeneity of study population of HCA maternity care staff. As an attribute of reliability, all items on the survey tool measured the concepts of BFHI's "Ten Steps to Successful Breastfeeding" with content validity verified by the expert staff at Baby-Friendly USA. External validity was strengthened due to the diverse clinical settings in this multisite study from a small rural community hospital to a large urban teaching hospital along with multiple provider roles.

A confounding factor to the study is the possible influence of the Joint Commission's Perinatal Core Measure on exclusive breastmilk feeding. Focused strategies to improve exclusive breastmilk feeding scores did not occur in these HCA facilities until after the completion of this study.

One limitation of this study is the lack of randomization with a control group due to the sample size in the facilities. To subdue the effect of this limitation, diverse medical facilities with varied healthcare professionals were utilized. Also, due to the disparity in sample size of 28 physicians compared with 181 nurses, a between-group comparison could not be performed. Ideally this study should be replicated in several large maternity care centers with randomization in order to clarify these questions.

Clinical Implications

With this studies large effect size, as demonstrated by the overall eta squared result of 0.19 and the Cohen's *d* result of 0.987, there is strong clinical significance (Pallant, 2010). The first step in life for a healthier life for an infant is breastfeeding. Combined with the benefits for the mother and society at large, it is in the best interest of all Americans to support that which is healthiest for our nation. This includes increasing knowledge, improving attitudes and removing barriers to maternity care practices that support breastfeeding.

Conclusion

Healthcare quality improvement and cost containment are important and timely issues in our country. Considering the unequalled and unquestionable benefits of breastfeeding, we must heed the Surgeon General's call to action to support breastfeeding in the healthcare sector through improved maternity care practices. WHO and UNICEF's Baby-Friendly Hospital Initiative is a recognized practice that improves breastfeeding outcomes. Previous studies have

illuminated the suboptimal clinical knowledge concerning the BFHI, while other researchers have demonstrated the increase in breastfeeding rates and duration when BFHI has been implemented in maternity care settings. This study indicates that targeted education provided to healthcare staff has a positive, significant impact on knowledge and attitudes about BFHI consistent maternity care practices.

This research demonstrates that a simple educational intervention for maternity healthcare providers in America regarding the implementation of maternity care practice consistent with the Baby-Friendly Hospital Initiative may successfully impact knowledge and attitudes. Follow-up work is critical to fully explore the best way to promote BFHI. Promoting the use of the maternity care practices established by BFHI not only will improve breastfeeding success rates for infants and mothers, but will also provide life-long health benefits for the mother and child. This educational program changed knowledge and attitudes consistent with the Baby-Friendly Hospital Initiative.

References

- Abrahams, S. W., & Lobbok, M. H. (2009) Exploring the impact of the Baby-Friendly Hospital Initiative on trends in exclusive breastfeeding. *International Breastfeeding Journal*, 4 (11), doi: 10.1186/1746-4358-4-11
- American Academy of Pediatrics. (2012). Breastfeeding and the use of human milk. *Pediatrics*, 115, 496-506. doi:10.1542/peds.2011-3552
- Baby Friendly Hospital Initiative. (2010) *Implementing the UNICEF/WHO Baby Friendly Hospital Initiative*. Sandwich, MA. Author. Retrieved from <http://www.babyfriendlyusa.org/eng/06.html>
- Barnes, M., Cox, J., Doyle, B., & Reed, R. (2010). Evaluation of a practice-development initiative to improve breastfeeding rates. *Journal of Perinatal Education*, 19(44), 17-23, doi: 10.1624/105812410X530893
- Bartick, M., & Reinhold, A. (2010). The burden of suboptimal breastfeeding in the United States: A Pediatric cost analysis. *Pediatrics*, 125, 1048-1056. doi:10.1542/peds.2009-1616
- Bernaix, L. W., Beaman, M. L., Schmidt C. A., Harris, J. K., & Miller, L. M. (2010). Success of an educational intervention on maternal/newborn nurses' breastfeeding knowledge and attitudes. *Journal of Obstetrics, Gynecology, and Neonatal Nursing*, 39(6), 658-666
- Centers for Disease Control and Prevention. (2008). *Healthy People 2020*. Atlanta, GA. Author. Retrieved from <http://healthypeople.gov/2020/topicobjectives.htm>

Centers for Disease Control and Prevention. (2014). *Breastfeeding Report Card 2014*. Atlanta, Ga. Author. Retrieved from

<http://www.cdc.gov/breastfeeding/pdf/2014/breastfeedingreportcard.pdf>.

Centers for Disease Control and Prevention. (2011). Vital signs: Hospital practices to support breastfeeding-United States, 2007 and 2009, *Morbidity and Mortality Weekly Report*, 60(30), <http://www.cdc.gov/mmwr>.

Centers for Disease Control and Prevention. (2011). *National Survey of Maternity Care Practices in Infant Nutrition and Care (mPINC)*. Atlanta, GA. Author. Retrieved from

<http://www.cdc.gov/breastfeeding/data/mpinc/index.htm>

Centers for Disease Control and Prevention. (2012) *Breastfeeding Report Card-United States, 2012*. Atlanta, GA. Author. Retrieved from

<http://www.cdc.gov/breastfeeding/data/reportcard.htm>

Chalmers, B., Levitt, C., Heaman, M., O'Brien, B., Sauve, R., & Kaczorowski, J. (2009).

Breastfeeding rates and hospital breastfeeding practices in Canada: A national survey of women. *Birth* 36 (2), 122-132.

Dall'Ogli, I., Salvatori, G., Bonci, E., Nantini, B., D'Agosinto, G., & Dotta, A. (2007).

Breastfeeding promotion in neonatal intensive care unit: Impact of a new program toward a BFHI for high-risk infants. *Acta Paediatrica*. 1626-1631. doi:10.1111/j.1651-2227.2007.00495x

Daniels, I., & Jackson, D. (2011). Knowledge, attitudes and practices of nursing staff regarding the Baby-Friendly Hospital Initiative in non-accredited obstetric units in Cape Town.

South African Journal of Clinical Nutrition, 24(1), 32-38.

- DiGiralamo, A.M., Grummer-Strawn, L.M., & Fein, S. (2008). Effects of maternity care practices: Implications for breastfeeding. *Pediatrics*, *122*, 543-549.
- Gau, M., L. (2004). Evaluation of a lactation intervention program to encourage breastfeeding: a longitudinal study. *International Journal of Nursing Studies*, *41*, 425-435.
- Hannula, L., Kaunonen, M., & Marja-Terttu, T. (2008). A systematic review of professional support interventions for breastfeeding. *Journal of Clinical Nursing*, 1132-1143. doi: 10.1111/j1365-2702.2007.02239.x
- Ingram, J., Johnson, D., & Condon, L. (2011). The effects of Baby Friendly Initiative training on breastfeeding rates and the breastfeeding attitudes, knowledge and self-efficacy of community health-care staff. *Primary Health Care Research & Development*. doi:10.1017/S1463423610000423
- King, I. (1981). *A theory for nursing: systems, concepts, process*. Albany, NY: Delmar.
- Merewood, A., Patel, B., Newton, K. N., MacAuley, L. P., Chamberlain, L. B., Francisco, P., & Mehta, S. D. (2007). Breastfeeding duration rates and factors affecting continued breastfeeding among infants born at an inner-city US Baby-Friendly Hospital. *Journal of Human Lactation* *23*(2), 157-164. doi:10.1177/9890334407300573
- Merewood, A., & Phillips, B. (2001). Implementing change: Becoming Baby-Friendly in an inner city hospital. *Birth* *28*(1), 36-40.
- Myers, J., A. (2013). Improve breastfeeding rates by increasing health care providers knowledge and attitude. *Kentucky Nurse*.
- Okolo, S. N., & Ogbonna, C. (2002). Knowledge, attitude and practice of health workers in Keffi local government hospital regarding Baby-Friendly Hospital Initiative practices. *European journal of Clinical Nutrition* *56*, 438-441. doi:10.1038/sj/ejcn/1691331

- Ouyang, Y., Xu, Y., & Zhang, Q. (2012). Survey on breastfeeding among Chinese female physicians and nurses. *Nursing and Health Sciences* 14, 298-303.
- Pallant, J. (4th Ed.). (2010). *SPSS survival manual*. Berkshire, England: McGraw-Hill.
- Philipp, B. L., Merewood, A., Miller, L. W., Chawla, N., Murphy-Smith, M. M., Gomes, J. S., Cimo, S., & Cook, J. T. (2001). Baby-Friendly Hospital Initiative improves breastfeeding initiation rates in a US hospital setting. *Pediatrics* 108(3), 677-681.
- Siddell, E., Marinellis, K., Froman, R., & Burke, G. (2003). Evaluation of an educational intervention on breastfeeding for NICU nurses. *Journal of Human Lactation*, 19, 293-301
- Taylor, C., Gribble, K., Sheehan, A., Schmied, V., & Dykes, F. (2011). Staff perceptions and experiences of implementing the Baby-Friendly Initiative in neonatal intensive care units in Australia. *Journal of Obstetrics, Gynecology and Neonatal Nursing* 40, 25-34.
doi:10.1111/j.1552-6909.2010.01204.x
- United States Breastfeeding Committee. (2009). *Health Care Reform: Improving breastfeeding support will Save billions*. Washington, DC. Author. Retrieved from <http://www.usbreastfeeding.org>
- United States Department of Health and Human Services. (2011). *The Surgeon General's call to action to support breastfeeding*. Washington, DC. Author. Retrieved from <http://www.surgeongeneral.gov>
- United States Department of Health and Human Services. (2011). *The Surgeon General's call to action to support breastfeeding*. Executive Summary (01/20/2011) Washington, DC. Author. Retrieved from <http://www.surgeongeneral.gov>

- Virginia Department of Health. (2010). Health Care Workforce Data Center, Registered Nurses, *Highlights from the 2007-2008 DHP Licensure Renewal Survey*, Retrieved April 28, 2013 from http://www.dhp.virginia.gov/hwdc/docs/RNFactSheet_08.pdf
- United States Department of Health and Human Services Health Resources and Services Administration. (2013). *The U. S. Nursing Workforce: Trends in Supply and Education- Results in Brief*. Retrieved April 30, 2013 from <http://bhpr.hrsa.gov/healthworkforce/reports/nursing.pdf>
- Walsh, A. D., Pincombe, J., & Henderson, A. (2011). An examination of maternity staff attitudes towards implementing Baby-Friendly Health Initiative accreditation in Australia. *Maternal Child Health Journal* 15, 597-609. doi:10.1007/s10995-010-0628-1
- Weddig, J., Baker S., & Auld, G. (2011). Perspectives of hospital-based nurses on breastfeeding initiation best practices. *Journal of Obstetrics, Gynecology, and Neonatal Nursing*, 40(2), 166-178. doi: 10.1111/j.1552-6909.2011.01232.x
- Zakarija-Grkovic, I. (2010). Effectiveness of the UNICEF/WHO 20-hour course in improving health professionals' knowledge, practices, and attitudes to breastfeeding: before/after study of 5 maternity facilities in Croatia. *Croatian Medical Journal*, 51(1), 396-405.

Appendix A
Baby-Friendly Search for Evidence

Search Database	Inclusion Search Terms	Number of Results	Applicable to Research Question
CINAHL	1-4	0	0
	1-5	0	0
	1- 3	6	5
	1, 2, & 4	218	7
	3 & 4	87	12
	3-5	4	3
Virginia Henderson International Nursing Library	1-5	32	2
PubMed	1-5	10	3
	1-3	45	5
MEDLINE	1-5	12	3
Cochrane	1-5	0	0
	1, 2, & 3	0	0
	1, 2, & 4	1	1
	3 & 4	0	0
	3-5	0	0
MD Consult	1-5	12	0
	1, 2, & 3	0	0
	1, 2, & 4	538	0
National Guideline Clearinghouse	3-5	4	1
TRIP	1-5	397	1
Google Scholar	1-5	1,140	Did not eval all results

Inclusion Search Terms 1. Knowledge, 2. Attitude, 3. Baby-Friendly Hospital Initiative, 4. Breastfeeding, 5. Maternity Care Practices.

Appendix B
BABY-FRIENDLY LITERATURE REVIEW RESULTS TABLE

Authors	Pub Year	Independent Variable	Dependent Variable-A	Dependent Variable-B	Dependent Variable-C	Dependent Variable-D	Conclusion
Bernaix, L. W., Beaman, M. L., Schmidt C. A., Harris, J K., & Miller, L. M.	2010	Educational Intervention	Knowledge: $P < .001$	Attitudes: $P < .001$	Beliefs: $P < .001$	Intention to support: $P < .001$	Educational intervention improves knowledge, attitudes, beliefs, and intention to support breastfeeding
Daniels, I., & Jackson, D.,	2011	Assessment	Knowledge : Only 1 out of 7 principles demonstrated statistical significance of $P < .006$	Attitudes: Majority had positive attitudes of BFHI principles and practices	Practices: Only 1 out of 7 practices demonstrated Statistical Significance $P < .005$	Barriers to implementation of BFHI: relationship established	Acceptable knowledge, majority of nurses had positive attitudes toward BFHI
Ingram, J., Johnson, D., & Condon, L.	2011	Educational Intervention	Knowledge: Statistical Significance	Attitudes: Statistical Significance	Self-Efficacy: Statistical Significance	Management of Breastfeeding: Increased	Improvements in Knowledge, attitude, self-efficacy and appropriate management after educational intervention
Okolo, S. N., & Ogbonna, C.	2002	Assessment	Knowledge: $P < 0.05$	Attitudes: $P < 0.05$	Practices: $P < 0.05$		General lack of knowledge,

							attitudes and practices that promote and support breastfeeding
Ouyang, Y., Xu, Y., & Zhang, Q.	2012	Assessment	Knowledge: <i>P</i> <0.05	Attitudes: <i>P</i> <0.05	Practices: <i>P</i> <0.05		Healthcare provider knowledge and attitudes are poor concerning breastfeeding practices
Taylor, C., Gribble, K., Sheehan, A., Schmied, V., & Dykes, F.	2011	Qualitative Assessment	Understanding Thematic relationship	Perceptions: Thematic relationship	Experiences: Thematic relationship	Barriers to implementation: Relationship established	Education can improve staff, knowledge and attitudes concerning BFHI and assists in overcoming barriers to implementation
Walsh, A. D., Pincombe, J., & Henderson, A.	2011	Qualitative Assessment	Knowledge: Thematic relationship	Attitudes: Thematic relationship		Barriers to implementation: Relationship established	Barriers to implementation are knowledge and attitude. Requires an understanding of the BFHI principles.

Appendix C

BABY-FRIENDLY LITERATURE REVIEW METHODOLOGIC MATRIX

Authors	Pub Year	Theory	Study Design	Dependent Variable	Sample Size	Conclusion
Bernaix, L. W., Beaman, M. L., Schmidt C. A., Harris, J. K., & Miller, L. M.	2010	Theory of Reasoned Action	Quasi-experimental, pretest/posttest design	Knowledge, attitudes, beliefs, and intention to support <i>P</i> <.001	206 RNs in experimental group, 34 RNs in control	Educational intervention improves knowledge, attitudes, beliefs, and intention to support breastfeeding
Daniels, I., & Jackson, D.,	2011	None	Cross-sectional descriptive survey	Knowledge, attitudes, practices and barriers to implementation	8 nurse managers, 45 nursing staff	Acceptable knowledge on some of BFHI principles while the NA ranked lowest in knowledge, majority of nurses had positive attitudes toward BFHI, Barriers identified: staffing shortages, heavy workloads, staff attitudes and knowledge.
Ingram, J., Johnson, D., & Condon, L.	2011	None	Quasi-experimental, pretest/posttest design	Knowledge, attitude, self-efficacy, and management of breastfeeding	137 participants 100 health visitors/37 nursery nurses	Improvements in Knowledge, attitude, self-efficacy and appropriate management after educational intervention

Myers, J., A.	2013	None	Quasi-experimental, pretest/posttest design	Knowledge, attitudes, and practices	Nurses, Obstetricians, Pediatricians, Family Practice	Increased knowledge and attitude resulted in increased breastfeeding rates
Okolo, S. N., & Ogbonna, C.	2002	None	Randomized Cross-sectional	Knowledge, attitudes, and practices	250 health workers Nurses, physicians and auxiliary staff	General lack of knowledge, attitudes and practices that promote and support breastfeeding demonstrating need for training and policy change related to BFHI. Statistical difference in Doctors ($P < 0.05$) knowledge compared to nurses.
Ouyang, Y., Xu, Y., & Zhang, Q.	2012	None	Non-experimental questionnaire	Knowledge, attitudes, and practices $P < 0.05$	367 physicians and nurses	Healthcare provider knowledge and attitudes are poor concerning breastfeeding practices
Siddell, E., Marinellis, K., Froman, R., & Burke, G.	2003	Theory of Reasoned Action	Quasi-experimental, pretest/posttest design	Knowledge and attitudes,	51 nurses	Education can improve staff, knowledge and attitudes concerning BFHI
Taylor, C., Gribble, K., Sheehan, A., Schmied, V., & Dykes, F.	2011	None	Qualitative Exploratory Study of naturalistic	Understanding perceptions, experiences and barriers to	47 nurses, midwives and physician	Education can improve staff, knowledge and attitudes concerning BFHI and assists in overcoming barriers

			methods of inquiry	implementation		such as lack of knowledge and poor attitudes toward BFHI practices and implementation
Walsh, A. D., Pincombe, J., & Henderson, A.	2011	None	Qualitative Focused group Interviews	Knowledge, attitudes, and barriers to implementation Thematic relationships	31 nurses, midwives, physicians, and ancillary staff	Barriers to implementation are knowledge and attitude. Requires an understanding of the BFHI principles.
Zakarija-Grkovic, I.	2010	None	Quasi-experimental, pretest/posttest design	Knowledge, attitudes, and practices	308 healthcare professionals	Education is an effective tool to improve health professionals knowledge, attitudes, and practices.

Appendix D



3700 South Main Street
Blacksburg, Virginia 24060
P.O. Box 90004
Blacksburg, Virginia 24062-9004
Telephone [REDACTED] Fax [REDACTED]
www.mrhospital.com

April 4, 2011

Marjorie Young, RNC, BSN, IBCLC
Lewis Gale Hospital – Montgomery
3700 South Main Street
Blacksburg, VA 24060

RE: Impact of an Educational Intervention on the Understanding of Maternity Practices Consistent With the “Baby-Friendly” Initiative

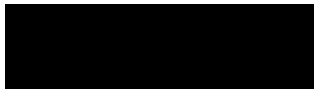
Dear Ms. Young:

The Institutional Review Board of Lewis Gale Hospital – Montgomery has reviewed your application for expedited review of the above-named study. The study is approved from April 4, 2011 through March 31, 2012. An application for continuing review should be completed by January 31, 2012 if the study will be continued past March 31, 2012.

During your study, **Adverse Events should be reported to the IRB immediately after they occur.** Once your study is concluded, please complete the Study Closure – Final Report form and submit back to the IRB Chair.

We look forward to the findings of your study once it is concluded.

Sincerely,



Wendy R. Downey, RN MS
Chair, Institutional Review Board

Appendix E



October 31, 2012

Marjorie Young, RNC BSN
LewisGale Hospital Montgomery
3700 South Main Street
Blacksburg, VA 24060

RE: Impact of an Educational Intervention on the Understanding of Maternity Practices Consistent with the “Baby-Friendly” Initiative – at LewisGale Medical Center

Dear Ms. Young:

The Institutional Review Board of Montgomery Regional Hospital completed an expedited review of your application for the above-named study. The study is approved for research at LewisGale Medical Center from October 31, 2012 through October 31, 2013.

This approval is for the protocol and informed consent version submitted October 30, 2012. Please know that you cannot make changes to the protocol, consents or any other part of your research plan without prior approval from the IRB. During your study, **Adverse Events should be reported to the IRB immediately after they occur.** Once your study is concluded, please complete the Study Closure – Final Report form and submit back to the IRB Chair along with the study abstract.

We look forward to the findings of your study once it is concluded.

Sincerely,

Wendy R. Downey, RN BSN MS
Chair, Institutional Review Board

Appendix F



October 31, 2012

Marjorie Young, RNC BSN
LewisGale Hospital Montgomery
3700 South Main Street
Blacksburg, VA 24060

RE: Impact of an Educational Intervention on the Understanding of Maternity Practices Consistent with the “Baby-Friendly” Initiative – at Henrico Doctor’s Hospital

Dear Ms. Young:

The Institutional Review Board of Montgomery Regional Hospital completed an expedited review of your application for the above-named study. The study is approved for research at Henrico Doctor’s Hospital via a current IRB Authorization Agreement with the facility limited to this specific protocol from October 31, 2012 through October 31, 2013.

This approval is for the protocol and informed consent version submitted October 30, 2012. Please know that you cannot make changes to the protocol, consents or any other part of your research plan without prior approval from the IRB. During your study, **Adverse Events should be reported to the IRB immediately after they occur.** Once your study is concluded, please complete the Study Closure – Final Report form and submit back to the IRB Chair along with the study abstract.

We look forward to the findings of your study once it is concluded.

Sincerely,

Wendy R. Downey, RN BSN MS
Chair, Institutional Review Board

Appendix G

Healthcare Provider Demographic: **3-4 ID** _____

Obstetric MD/DO _____ **CNM/CNS/NP** _____ **Pediatric MD/DO** _____

RN Educational Level:

Diploma _____ **Associate Degree** _____ **Bachelors Degree** _____ **Graduate** _____

Age: **20-30** _____ **31-40** _____ **41-50** _____ **51-60** _____ **> 60** _____

Years of Experience: **1-3** _____ **4-6** _____ **7-10** _____ **11-15** _____ **16-20** _____ **>20** _____

LPN _____ **Unit Secretary/OR/OB Tech or OT/Speech** _____

Knowledge Questions:

1. The Baby Friendly Hospital Initiative (BFHI) is:

- a) HCA’s new maternity center marketing program
- b) Joint Commission’s initiative to promote the new Exclusive Breastfeeding Core Measure
- c) A hospital based parenting program to encourage infant self-esteem
- d) A global program sponsored by the WHO and UNICEF to recognize hospitals that demonstrate optimal infant feeding practices

2. How many Virginia hospitals are currently designated as “Baby-Friendly”?

- a) One
- b) Ten
- c) Fifty
- d) All... Who doesn’t love babies?

3. Which of the following IS NOT one of BFHI’s “Ten Steps to Successful Breastfeeding”?

- a) Inform all pregnant women about the benefits and management of breastfeeding
- b) Help mothers initiate breastfeeding within one hour of birth
- c) Offer pacifiers and formula to breastfeeding mothers if requested
- d) Encourage breastfeeding on demand

4. Which of the following IS one of BFHI’s “Ten Steps to Successful Breastfeeding”?

- a) Provide a newborn nursery, to allow for more maternal rest
- b) Insist that mothers awaken their infants to breastfeed at least every 2-3 hours
- c) Foster the establishment of breastfeeding support groups and refer mothers to them at hospital discharge

- d) Utilize free or low cost supplies of breast milk substitutes when needed.

5. In a federally sponsored survey of more than one-thousand women, what percentage of mothers experienced at least five of the “Ten Steps to Successful Breastfeeding” during their maternity experience?

- a) 8
- b) 25
- c) 63
- d) 78

True or False Questions:

- ___ 1. BFHI requires that hospitals have a written breastfeeding policy that is routinely communicated to all health care staff.

- ___ 2. In order to be designated as “Baby Friendly,” only the nurses who work with breastfeeding patients need to receive specific breastfeeding education.

- ___ 3. The more of the “Ten Steps” a mother experiences, the greater her likelihood of continuing breastfeeding at and beyond 6 weeks postpartum

- ___ 4. One of the strongest risk factors for early breastfeeding termination is supplementation of the baby

- ___ 5. BFHI has been shown to increase the duration of exclusive breastfeeding, but not breastfeeding rates

Attitude Questions:

1. A woman's decision about whether to breastfeed is influenced by health care professionals

Strongly Disagree

Strongly Agree

1

2

3

4

5

2. Hospital practices have a significant effect on breastfeeding success

Strongly Disagree

Strongly Agree

1

2

3

4

5

3. Increasing the rate and duration of breastfeeding is an important goal for health promotion

Strongly Disagree

Strongly Agree

1

2

3

4

5

4. Accepting free promotional formula is a conflict of interest for health care facilities and providers

Strongly Disagree

Strongly Agree

1

2

3

4

5

5. Being a "Baby-Friendly" designated hospital is evidence of a strong commitment to excellent patient care

Strongly Disagree

Strongly Agree

1

2

3

4

5

Appendix H

Baby-Friendly Initiative Consent for Study

This study has not more risk than you will find in daily life.

Participation in this survey is voluntary. The researchers will pair pre and post survey results by 3-4ID for statistical analysis which are not identifiable to the individual by the researcher. You may decide not answer specific questions.

Your participation is consent to allow us to use your responses for internal reports, published articles, and scholarly presentations. Your name will not be linked in any way to anything we present.

There is no compensation for participating and the direct benefit of participating in this study is increased knowledge pertaining to the Baby-Friendly Initiative. Your participation may give the researchers a better understanding of the baseline knowledge of the Maternity Care Center's healthcare providers and staff in regards to the Baby-Friendly Initiative.

If you have any questions before, during, or after the study, you may contact Marjorie Young at [REDACTED], [REDACTED] [@hcahealthcare.com](mailto:[REDACTED]@hcahealthcare.com).

This study has been approved by the LewisGale Healthsystem Institutional Review Board for the Review of Human Subjects Research. If you have questions or concerns about your rights as a research subject or have complaints about this study, you should contact Wendy Downey Chair of the LewisGale Healthsystem Institutional Review Board for the Review of Human Subjects Research, [REDACTED], [REDACTED] [@hcahealthcare.com](mailto:[REDACTED]@hcahealthcare.com).

It is your choice whether or not to be in this study. What you choose will not affect any current or future relationship with LewisGale Medical Center.

Appendix I

Baby-Friendly Budget

Item	Cost	Comment
Copies		
Pre/posttest	\$24.00	Print materials and print cost donated by HCA
Consents	\$6.00	
Ten Steps	\$6.00	
Candy Bars	\$150.00	Grant funding from March of Dimes covered cost of candy
Travel Expenses		
Mileage	\$497.50	50 cents/mile 3 Trips to Richmond VA & 4 Trips to Salem VA
Food	\$175.00	Est. \$25.00/day out of town.
Hotel	\$445.00	\$89.00/night 5 nights in Richmond VA
Presentation	2,100	3 IBCLCs with \$35/HR estimated > 60 hours
Total	3,403.5	

ACKNOWLEDGMENTS

Gratefully acknowledge the assistance of Jean Duetsch BSN, IBCLC, Evalin Trice BS, IBCLC, Tina Osborne BSN, Carol Custer BSN, RNC, IBCLC, and Denise DeCicco MSN, RNC, CPNP, IBCLC, for data collection for this research study. Also acknowledging the assistance of Dr. A. Ramsey and Dr. K. Carter for their assistance and mentoring for this research study. This study was supported by funding from the March of Dimes and LewisGale Regional Health System an affiliate of Hospital Corporation of America.

The greatest of thanks and gratitude to my Father who art in heaven, my husband Scott and my family. This Capstone Project could not have been accomplished without their love and support.

I am deeply appreciative.

Marjorie H. Young