

DISSERTATION

IMPROVING BREASTFEEDING INITIATION PRACTICES OF REGISTERED
NURSES THROUGH ONLINE THEORY-BASED EDUCATION

Submitted by

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ABSTRACT

IMPROVING BREASTFEEDING INITIATION PRACTICES OF REGISTERED NURSES THROUGH ONLINE THEORY-BASED EDUCATION

Project Rationale

The benefits of breastfeeding are clearly established (Ip, Chung, & Raman, 2007), yet couplets in the United States (US) and in Colorado do not meet many of the Healthy People 2010 goals for breastfeeding duration. Hospitals that perform evidence-based best practices related to breastfeeding can improve breastfeeding initiation rates, rates of exclusive breastfeeding at time of hospital discharge, and possibly breastfeeding duration rates (Broadfoot, Britten, Tappin, & MacKenzie, 2005; Manganaro et al., 2009). One of the reasons that mothers report discontinuing breastfeeding is that they receive conflicting messages from healthcare providers.

A knowledge deficit exists in practicing registered nurses (Chiu, Gau, Kuo, & Chung, 2003; Holaday, Karipis, & Spicer, 1999), and the amount of didactic and clinical breastfeeding education provided in undergraduate nursing programs is not adequate (Spear, 2006). Lack of adequate evidenced-based knowledge content in obstetric nursing courses can lead to a knowledge deficit related to breastfeeding best practices (Hellings & Howe, 2004). This knowledge deficit can lead to inconsistent advice given to mothers when the student nurse becomes a practicing registered nurse (RN).

Additional education related to breastfeeding initiation best practices is needed for registered nurses. Currently, very few courses that are available for nursing students and registered nurses that adequately cover the topic of breastfeeding. Because the schedules of hospital-based registered nurses vary, online education presents a unique opportunity to provide continuing education (Chang, Hsiao Sheen, Chang, & Lee, 2008; Wilkinson, Forbes, Bloomfield, & Fincham Gee, 2004).

Objective

Phase I: Focus groups were conducted to assess the variation in breastfeeding knowledge and practices of registered nurses working in hospital maternity units and the informal and formal hospital policies related to the initiation and support of breastfeeding.

Phase II: The focus group data were used to create a one-credit online course for registered nurses in breastfeeding best practices targeting hospital-based registered nurses. The objective of the second phase of the study was to determine if a one-credit online course (with an eight-hour, in-person practicum) results in changes in the knowledge and behaviors of hospital-based registered nurses in relation to breastfeeding initiation best practices.

Design

This was a mixed-methods study. Qualitative focus group data were collected about perceptions of hospital-based registered nurses regarding breastfeeding best practices. These data were used to develop an online course with an eight-hour practicum designed to increase registered nurses knowledge and improve behavior in the area of breastfeeding initiation. Data were collected from treatment and comparison groups

before and after the course and the practicum to assess change in knowledge and behavior.

Interviews were conducted with management teams at three Colorado hospitals 12 months after registered nurses in those hospitals completed the online course in order to assess perceptions of changes that had occurred as related to breastfeeding initiation policies and best practices.

Participants

Forty female registered nurses from labor and delivery (n=9), postpartum (n=13), labor and delivery/ recovery/ postpartum care (LDRP) (n=12), and neonatal intensive care units (NICU) (n=6) comprised eight focus groups. In the intervention, 45 female registered nurses participated in the comparison group, and 50 female registered nurses comprised the treatment group.

Results

According to the focus group data, the majority of registered nurses reported being knowledgeable of evidence-based best practices related to breastfeeding initiation. However, in non-Baby Friendly/ Baby Friendly Intent Hospitals (non-BF/BFI), nurses knowledge often was not in accordance with current best practices in breastfeeding initiation, and reported hospital policies were not based upon evidence-based practices. Barriers to best practices in breastfeeding initiation included hospital lactation policies (formal and informal), registered nurses' limited knowledge in breastfeeding initiation best practices, high rates of surgical delivery, and lack of continuity of care with the transition of responsibility from one nurse to another from labor and delivery to transition care to postpartum care.

According to the data from the three data collection tools used in the second phase of the research, registered nurses in the treatment group demonstrated an increase in knowledge; however, there was very little change in nursing behaviors. There were statistically significant changes in registered nurses behaviors related to appropriate use of formula supplementation as evidenced by the chart review ($p < .05$).

Results of the management interviews indicate two out of three hospitals had policy and procedure changes during the 12 months after completing the online course. A significant disparity between nurses' intention to support breastfeeding and their knowledge suggests there is a need for education based on the World Health Organization Baby Friendly standards for registered nurses at non-BF/BFI hospitals. A significant barrier to supporting breastfeeding is a lack of hospital policy and/or inappropriate or outdated policy. The online course produced changes in knowledge, but change in behavior did not occur as predicted. This is likely due to existing hospital policy and culture that must change in order to support breastfeeding initiation best practices. Once policy was changed, registered nurses were able to make behavior changes. The establishment of breastfeeding policies allowed the environment of best practices to remain the norm even as registered nurses or nurse managers are replaced by other registered nurses.

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CHAPTER 1

INTRODUCTION

Project Rationale

Exclusive breastfeeding for at least one year decreases the risk of developing chronic diseases including obesity, asthma and allergy, gastrointestinal disorders, childhood cancer, diabetes, and other chronic diseases later in life (Ip, Chung, & Raman, 2007). The benefits of breastfeeding are clearly established, yet couplets in the United States do not meet many of the Healthy People 2010 (HP2010) goals for breastfeeding. Without additional education for registered nurses along with hospital breastfeeding policy updates hospitals are less likely to meet the Healthy People 2020 (HP2020) goals established for breastfeeding initiation, duration, and exclusivity. Breastfeeding rates in the United States according to the CDC 2010 breastfeeding report card were 75% in the early postpartum period, with 43% breastfeeding at six months, 27.4% at 12 months, 33% of women exclusively breastfeeding at three months and 13.3% exclusively breastfeeding at 6 months (Centers for Disease Control, 2009). These rates fall short of the HP 2020 goals of 81.9% of women initiating breastfeeding in the early postpartum period, 60.5% breastfeeding at six months, 34.1% at 12 months, 44.3% of women exclusively breastfeeding their infants at three months, and 23.7% exclusively breastfeeding through six months (Centers for Disease Control, 2009). Presently in Colorado, breastfeeding rates are above the national averages for initiation, with 88.7% of mothers initiating

breastfeeding in the early postpartum period, but the rates fall below the HP 2020 goals in breastfeeding duration with 57.7% breastfeeding at six months, and only 29.3% of women breastfeeding at 12 months (Centers for Disease Control, 2009; United States Department of Health and Human Services, 2010). Currently, 26% of all healthy breastfed infants born in the US, and 16.5% of those born in Colorado, receive formula supplementation while in the hospital. The HP 2020 goal is to reduce the proportion of healthy breastfed infants who receive supplementation to less than 15.6% (United States Department of Health and Human Services, 2010)

While the breastfeeding initiation rates in the US and Colorado came close to or exceed the HP 2020 breastfeeding initiation goals, respectively, duration rates fell short. The most significant decrease in breastfeeding rates occurs in the first two to four weeks after birth. Women need considerable breastfeeding support during the postpartum period in order to maximize the odds that they will continue breastfeeding (Ahluwalia, Morrow, & Hsia, 2005).

Health care practitioners play an integral role in a woman's initial decision to breastfeed, as well as her commitment to continue to breastfeed and how long they successfully breastfeed (DiGirolamo, Grummer-Strawn, & Fein, 2001). Consistent messages from healthcare providers that promote breastfeeding can increase initiation and duration. However, many registered nurses and physicians have little or no formal education in breastfeeding initiation (Labarere, Castell, Fourny, Durand, & Pons, 2003). The unfortunate result of this lack of education is that many patients receive conflicting

advice and insufficient instruction in breastfeeding techniques from their healthcare professionals, stating that this is a primary reason for discontinuing breastfeeding (DiGirolamo, et al., 2001).

Hospitals that perform evidence-based best practices related to breastfeeding have improved breastfeeding initiation rates, rates of exclusive breastfeeding at time of hospital discharge and breastfeeding duration rates (Broadfoot, Britten, Tappin, & MacKenzie, 2005; Manganaro et al., 2009). Rosenberg, Stull, Adler, Kasehagen, and Crivelli-Kovach (2008) found that hospitals with clear breastfeeding policies are more likely to provide better breastfeeding support services and have couplets with improved breastfeeding outcomes. In addition, hospitals who implemented policies related to the Baby Friendly Hospital Initiative (BFHI) and provided registered nurses with 18 hours of education in breastfeeding initiation best practices had improved exclusive breastfeeding and overall breastfeeding rates as compared to hospitals without clear policies (Merten, Dratva, & Ackermann-Liebrich, 2005; Philipp et al., 2001; United Nations Childrens Fund and The World Health Organization, 2010).

The Baby-Friendly Hospital Initiative (BFHI) is a global program sponsored by the World Health Organization (WHO) and the United Nations Children's Fund (UNICEF) to recognize hospitals and birthing centers that offer evidence-based medical care in the area of lactation (United Nations Childrens Fund and The World Health Organization, 2010). The BFHI recognizes hospitals that meet 10 specified steps in providing optimal care in the area of lactation support.

According to Baby Friendly USA, the BFHI 10 steps to successful breastfeeding 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 mothers initiate breastfeeding within one half-hour of birth.
5. Show mothers how to breastfeed and maintain lactation, even if they should be separated from their infants.
6. Give newborn infants no food or drink other than breastmilk, unless medically indicated.
7. Practice rooming in - that is, allow mothers and infants to remain together 24 hours a day.
8. Encourage breastfeeding on demand.
9. Give no artificial teats or pacifiers (also called dummies or soothers) to breastfeeding infants.
10. Foster the establishment of breastfeeding support groups and refer mothers to them on discharge from the hospital or clinic.(United Nations Childrens Fund and The World Health Organization, 2010)

A knowledge deficit exists among practicing registered nurses (Chiu, Gau, Kuo, & Chung, 2003; Holaday, Karipis, & Spicer, 1999); the amount of didactic and clinical breastfeeding education provided in undergraduate nursing programs is not adequate (Spear, 2006). The lack of adequate evidenced-based breastfeeding content in nursing courses can lead to a knowledge and skill deficit related to breastfeeding best practices (Hellings & Howe, 2004), and potentially contribute to inconsistent advice given to mothers when the student becomes a practicing registered nurse (RN). Currently there are few courses available to nurses that adequately cover the topic of evidence-based breastfeeding best practices, and very few hospital policies are in place to support these practices. Courses that are available can be found at www.ilca.org and are too varied in type and location to discuss.

Most registered nurses and nurse practitioners acknowledge that “breast is best,” but lack the evidence-based knowledge and skills to support breastfeeding best practices (Hellings & Howe, 2004). It is necessary to create accessible breastfeeding best practices education that can be disseminated to post-registration nurses.

Many full-time registered nurses find it difficult to take time away from their busy schedules to physically attend courses which may help them acquire this knowledge (Chang, Hsiao Sheen, Chang, & Lee, 2008). Because the schedules of hospital-based registered nurses are varied, online education presents a unique opportunity to provide continuing education that has a lesser impact on the nurses’ schedules and family constraints. Online courses are the most flexible and convenient way to provide education

for registered nurses (Chang, et al., 2008; Wilkinson, Forbes, Bloomfield, & Fincham Gee, 2004).

The purpose of this study was to determine if a one-credit online course (with an eight-hour, in-person practicum) results in changes in the knowledge, behaviors, and skills of hospital-based registered nurses in relation to breastfeeding initiation best practices.

Research Questions

The following research questions were addressed in this study:

Formative research questions

1. What do maternity nurses know about evidence-based best practices related to breastfeeding initiation?
2. What hospital policies exist related to breastfeeding?
3. What level of continuing education is provided to registered nurses about supporting breastfeeding initiation best practices?
4. How do registered nurses want to receive continuing education about breastfeeding initiation?

Course intervention research questions

1. To determine if a one-credit online course (with an eight-hour, in-person practicum) results in changes in the knowledge, behaviors, and skills of hospital-based registered nurses in relation to breastfeeding initiation best practices.

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CHAPTER 2: LITERATURE REVIEW

This review of literature will discuss current breastfeeding rates in Colorado and the United States, benefits of breastfeeding and human milk for infants, and benefits of breastfeeding for women. In addition, the review will describe the effects of the Baby Friendly Hospital Initiative (BFHI), designed to increase breastfeeding rates worldwide, and the BFHI “Baby Friendly Hospital” designation. Nurses’ knowledge about supporting breastfeeding and the role of policy also will be reviewed.

Current Rates of Breastfeeding

Breastfeeding rates in the United States according to the CDC 2010 breastfeeding report card were 75% in the early postpartum period, with 43% breastfeeding at six months, 27.4% at 12 months, 33% of women exclusively breastfeeding at three months and 13.3% exclusively breastfeeding at 6 months (Centers for Disease Control, 2009). These rates fall short of the Healthy People 2010 (HP2010) goals of 60% of women exclusively breastfeeding their infants at three months, and 25% exclusively breastfeeding through six months (Centers for Disease Control, 2010). Without additional education for registered nurses along with hospital breastfeeding policy updates, hospitals are less likely to meet the Healthy People 2020 (HP2020) goals established for breastfeeding initiation, duration, and exclusivity.

The HP 2020 goals include 81.9% of women initiating breastfeeding in the early postpartum period, 60.5% breastfeeding at six months, 34.1% at 12 months, 44.3% of women exclusively breastfeeding their infants at three months, and 23.7% exclusively breastfeeding through six months (Centers for Disease Control, 2009).

In Colorado, the breastfeeding rates according to the CDC 2010 breastfeeding report card are above the national averages, with 88.7% of mothers initiating breastfeeding in the early postpartum period, 57.7% breastfeeding at six months, and 29.3% breastfeeding at 12 months. In addition, 46.8% of women are exclusively breastfeeding at three months, and 22.5% are exclusively breastfeeding their infants at six months of age (Centers for Disease Control, 2009). The rates of breastfeeding in Colorado meet the Healthy People 2010 goals for breastfeeding initiation in the early postpartum period and duration at six months but fall short of the goals for any breastfeeding at 12 months and exclusivity at 12 months (Centers for Disease Control, 2009).

**Maternal, Infant and Child Health
Breastfeeding Objectives**

Objective 21: Increase the proportion of infants who are breastfed	HP2020	HP2010	Colorado 2010
21.1 Ever	81.9%	75%	88.7%
21.2 At 6 months	60.5%	50%	57.7% *
21.3 At 1 year	34.1%	25%	29.3% *
21.4 Exclusively through 3 months	44.3%	40%	46.8%
21.5 Exclusively through 6 months	23.7%	17%	22.5% *

Looking forward at the HP 2020 breastfeeding goals; while Colorado breastfeeding rates are above the national averages for initiation, with 88.7% of mothers initiating breastfeeding in the early postpartum period, the rates fall below the HP 2020 goals in breastfeeding duration with 57.7% breastfeeding at six months, and only 29.3% of women breastfeeding at 12 months (Centers for Disease Control, 2009; United States Department of Health and Human Services, 2010). Currently, 26% of all healthy breastfed infants born in the US, and 16.5% of those born in Colorado, receive formula supplementation while in the hospital. The HP 2020 goal is to reduce the proportion of healthy breastfed infants who receive supplementation to less than 15.6% (United States Department of Health and Human Services, 2010).

Breastfeeding Definitions Used in Research

Because breastfeeding behaviors vary and clear definitions of frequency, duration, and exclusivity of breastfeeding did not exist prior to 1990, Labbok and Krasovec (1990) established the following framework for consistency in defining breastfeeding. Consistent breastfeeding definitions help clarify many research findings related to the benefits of breastfeeding for mother and baby because many benefits are dose-dependent and influenced by exclusivity and duration (Labbok & Krasovec).

Full breastfeeding is broken into two subcategories: full exclusive breastfeeding, and full almost exclusive breastfeeding. Full exclusive breastfeeding is defined as receiving only breast milk and no other liquids or solids. Full almost exclusive

breastfeeding is defined as receiving breast milk and vitamins, minerals, juice, or ritualistic feedings (Labbok & Krasovec, 1990).

Partial breastfeeding is broken into three subcategories: partial high breastfeeding, partial medium breastfeeding, and partial low breastfeeding. Partial high breastfeeding is defined as receiving more than 80% of feedings are human milk partial medium breastfeeding indicates that 20% to 80% of feedings are human milk; and partial low breastfeeding is when less than 20% of feedings are human milk (Labbok & Krasovec, 1990). Token-minimal breastfeeding is defined as occasional and irregular breastfeedings for comfort or consoling, but not for the purpose of providing a primary source of nutrition (Labbok & Coffin, 1997).

Benefits of Breastfeeding and Human Milk

It is well documented that human milk is the ideal food for infants (Heinig, 2001). The American Academy of Pediatrics (AAP) and the American Dietetic Association (ADA) recommend exclusive breastfeeding for the first six months of life, and then continued breastfeeding, in addition to complementary foods, for at least the first 12 months of life and beyond, if mutually agreeable (American Academy of Pediatrics Work Group on Breastfeeding, 2005; Dobson & James, 2005). Formula feeding increases an infant's risk for gastrointestinal illness (Bernt & Walker, 1999; Dewey, Heinig, & Nommsen-Rivers, 1995), otitis media (Engel, Anteunis, Volovics, Hendriks, & Marres, 1999), allergy and atopic disease (Saarinen & Kajosaari, 1995; Snijders, Thijs, Dagnelie, Stelma, Mommers, Kummeling, et al., 2007), pediatric cancer (Bener, Hoffmann, Afify,

Rasul, & Tewfik, 2008; Dobson & James, 2005), sudden infant death syndrome (Gordon, Saadi, MacKenzie, Molony, James, Weir, et al., 1999; Kattwinkel, Hauck, Keenan, Malloy, & Moon, 2009), obesity (Armstrong & Reilly, 2002; Novotny, Coleman, Tenorio, Davison, Camacho, Ramirez, et al., 2007; Palou & Picó, 2009) and diabetes (Pettitt, Forman, Hanson, Knowler, & Bennett, 1997). In addition, a woman who does not breastfeed has an increased risk of pre- and post-menopausal breast cancer (Trggvadottir, Tulinius, Jorunn, & Sigurvinsson, 2001), ovarian cancer (McLaughlin, Risch, Lubinski, Moller, Ghadirian, Lynch, et al., 2007), cardiovascular disease (Parikh, Hwang, Ingelsson, Benjamin, Fox, Vasan, et al., 2009; Stuebe, Michels, Willett, Manson, Rexrode, & Rich-Edwards, 2009), obesity (Kac, Benicio, Velasquez-Melendez, Vlente, & Struchiner, 2004), postpartum depression (Hatton, Harrison-Hohner, Coste, Dorato, Curet & McCarron 2008), and Type II diabetes (Hoddinott, Tappin, & Wright, 2008).

Benefits of Breastfeeding for the Infant

Decreased risk of gastrointestinal diseases. The immaturity of the newborn's gut and immune system puts the infant at increased risk for gastrointestinal illness (Bernt & Walker, 1999). In a mature gastrointestinal tract, the intestinal epithelium acts as a barrier to bacteria or toxins. Gastric acidity, pancreatic enzymes, and gut peristalsis prevent pathogens from attaching to the gut wall and causing gastrointestinal illness. In neonates, the gastric secretion and pancreatic enzyme production is less than in an older baby, and at birth the brush border of the infant's intestine is more permeable to bacteria. Breast milk contains many active constituents that are able to transmit biochemical

messages, including hormones, enzymes, cytokines, lactoferrin, and other milk-specific substances. Many of these have maturational effects on the intestinal mucosa, thereby decreasing the risk for gastrointestinal illness (Bernt & Walker).

The Davis Area Research on Lactation, Infant Nutrition, and Growth Study (DARLING) conducted by Dewey, Heinig, and Nommsen-Rivers (1995) compared matched infant cohorts who were either breastfed (n=46) or formula fed (n=41) until age 12 months. This study found that, in formula-fed infants, the incidence of diarrheal illness (defined by two or more runny stools per day that were different from the child's normal stool quality), was nearly twice the incidence of diarrheal illness in breastfed infants even after controlling for daycare exposure and number of siblings (Dewey et al.).

Decreased risk of otitis media. Lack of breastfeeding may increase the infant's risk for otitis media or ear infection (Engel et al., 1999; Heinig, 2001; Ip, Chung, & Raman, 2007). Otitis media, is frequently related to the earlier development of an upper respiratory infection. An upper respiratory tract infection increases the risk for otitis media by causing blockage of the eustachian tubes. Exclusive breastfeeding may decrease the risk of otitis media by exposing the nasopharynx of the infant to breast milk which contains immunoglobulins and substances that decrease viral or bacterial adherence to tissue. In a meta-analysis of the data on the incidence of ear infection, the relative risk ratio for development of ear infection of ever-breastfed infants compared to exclusively bottle fed infants was .77 (Ip et al., 2007). In the DARLING study conducted by Dewey et al. (1995), after controlling for daycare use and number of siblings in an infant's home,

the number of episodes of otitis media was significantly less in breastfed infants (zero episodes, 42%; one episode, 24%; two or more episodes, 34%) than in formula-fed infants (zero episodes, 18%; one episode, 25%; two or more episodes, 57%) (Dewey et al.).

Decreased risk of allergies and asthma. Children with a family history of allergy and atopic dermatitis who were breastfed may have a reduced risk of developing allergy and atopic disease (Saarinen & Kajosaari, 1995). Children with a family history of these diseases who were exclusively breastfed for greater than three months had a relative risk ratio of .58 for developing atopic disease (Ip et al., 2007). Breastfeeding also may reduce an infant's risk for childhood asthma when there is a family history of asthma (Ip et al., 2007).

Decreased risk of childhood cancers. Children who were not breastfed as infants have an increased risk of childhood cancers (Bener, Hoffman, Afify, Rasul, and Tewfik, 2008; Dobson & James, 2005). Childhood leukemias include acute lymphocytic leukemia (ALL), acute myelogenous leukemia (AML), Hodgkin's Lymphoma (HL), Non-Hodgkin's Lymphoma (NHL) and chronic myelogenous leukemia (CML). Roughly 3,250 children are diagnosed with leukemia each year in the United States, and 74% of those are diagnosed with ALL. The causes of childhood leukemia remain unknown (Ip et al., 2007), but there is an association between breastfeeding and reduced risk of childhood leukemias. Hoffman and Forste conducted a study in 2008 to investigate the effects of breastfeeding on the development of lymphoid malignancies. The study

compared 169 patients who had ALL, HL, and NHL to 169 healthy control subjects. The treatment subjects were age- and sex-matched to their control counterparts. The telephone interviews with the patients' mothers were used to collect data on the history of breastfeeding and other parameters that may have contributed to viral infection (Forste & Hoffmann, 2008). This study found that in all of the ALL patients, breastfeeding for zero to six 6 months was associated with an increased odds ratio for developing ALL in both males (OR 3.1, 95% CI 10.0-13.0) and in females (OR 2.2, 95%CI .8-6.32) when compared to healthy children who were breastfed for greater than six months (Forste & Hoffman, 2008). There is an association between any breastfeeding and reduced risk of AML, and a relationship between breastfeeding for at least six months and a reduced risk for AML and ALL (Horta, Bahl, Martines, & Victora, 2009; Ip et al., 2007). In addition, breastfeeding for a period greater than six months results in a decreased risk of Hodgkin's (HL) and Non-Hodgkin's (NHL) lymphomas (Bener et al., 2008).

Decreased risk of obesity, hypertension, and cardiovascular disease. Adults who were not breastfed as infants have increased risk of overweight, hypertension, high levels of low density lipoprotein (LDL), and increased total cholesterol (Lloyd-Jones, Adams, Brown, Carnethon, Dai, De Simone, et al., 2010; Parikh et al., 2009; Stuebe et al., 2009). Increases in these cardiovascular disease parameters are related to increased risk for cardiovascular disease (heart attack) and stroke. Any breastfeeding is associated with a small reduction in systolic blood pressure later in life, which may in turn decrease the risk for heart attack and stroke (Ip et al., 2007).

Decreased risk of sudden infant death syndrome (SIDS). Sudden infant death syndrome (SIDS) refers to the death of an infant that remains unexplained after thorough investigation (Willinger, James, & Catz, 1991). Infants who received any breastfeeding at all have a reduced risk of SIDS when compared to exclusively formula-fed infants (Ip et al., 2007). A meta analysis conducted by McVea, Turner, and Pepler (2000) of 19 studies which examined risk factors and protective factors of SIDS, breastfeeding was found to be protective. In this meta analysis, bottle-fed infants had a 2.1 fold increased risk of death from SIDS (McVea, Turner, & Pepler).

Decreased risk of diabetes. Lack of breastfeeding may increase the risk of developing Type I diabetes later in life. Type I diabetes is caused by destruction of the beta cells in the pancreas which produce insulin. The cause of this autoimmune destruction is unknown; however, the disease is thought to have both genetic and environmental components. The environmental component of this disease may include viral infection and breastfeeding may be protective against viral infection. Children who were breastfed for greater than three months have a reduced risk of developing Type I diabetes mellitus as compared to those who were breastfed for less than three months or who were exclusively formula-fed (Ip et al., 2007).

Lack of breastfeeding during infancy may increase the risk for Type II diabetes in adulthood. Type II diabetes develops in people who experience insulin-resistance related to overweight, inactivity, and genetic factors (American Diabetes Association, 2009). In 1998, Baur, O'Conner, Pan, Kriketos, and Storlien observed that long chain

polyunsaturated fatty acid (PUFA) concentration in muscle membranes and fasting blood glucose are inversely related. Long chain PUFAs are found in breast milk and, while long chain PUFAs recently have been added to some formula in the form of docosahexaenoic acid (DHA) and arachadonic acid (AA), the PUFAs in formula may not be present in an adequate amount, and the DHA or AA present may not be bioavailable (Sala-Vila, et al., 2004). It is postulated that incorporation of the long chain PUFAs found in breast milk into the skeletal muscle membrane decreases the likelihood that the muscle membrane will become insulin-resistant (Horta et al., 2009). Any breastfeeding during infancy and childhood reduces the risk of Type II diabetes later in the life. (Hoddinott et al., 2008; Owen, Martin, Whincup, Smith, & Cook, 2006).

Benefits of Breastfeeding for the Mother

Decreased risk of breast cancer. Breast cancer is the second most diagnosed disease and the second most deadly type of cancer in women (American Cancer Society, 2009). The risk for developing breast cancer is reduced in women who have ever breastfed. Several studies indicate that each month of breastfeeding during a woman's lifetime reduces the risk of developing breast cancer (Furberg, Newman, Moorman, & Millikan, 1999). Other studies indicate that breastfeeding greater than 12 months over a woman's life decreases her risk for breast cancer (Huo, Adebamowo, Ogundiran, Akang, Campbell, Adenipedun, et al., 2008). Most studies indicate that breastfeeding has a dose-dependent effect on decreasing risk for breast cancer (De Silva, Senarath, Gunatilake, & Lokuhetty (in press); Kim, Choi, Lee, Park, Ahn, Noh, et al., 2007). In addition, any

breastfeeding is associated with a decreased risk of ovarian cancer in women (Ip et al., 2007; McLaughlin et al., 2007).

Decreased risk of cardiovascular disease. Cardiac disease in women causes approximately one in every three deaths in the United States (Lloyd-Jones et al., 2010). Women who breastfed for a total of two years or more over their lifetime had a significantly decreased risk (37%) for cardiovascular disease, including strokes, later in life (Stuebe et al., 2009).

Decreased risk of clinical postpartum depression. It is estimated that between 10% and 20% of mothers experience clinical postpartum depression which is different than the transient and less severe “baby blues,” experienced by approximately 50% of women during the postpartum period (Warner, Appleby, & Whitton, 1996). Breastfeeding may have a protective effect against development of clinical postpartum depression in women. In a British study that was conducted using a sample of 2,375 postpartum women, Warner et al. found that there was an increased incidence of depression at six to eight weeks postpartum in women who did not breastfeed. In a study conducted by Hatton et al. (2005) at Oregon Health and Science University, 377 women completed the Edinburgh postnatal depression scale (EDPS). Even when controlling for past history of depression there is an inverse relationship between breastfeeding and postpartum depression at six weeks postpartum (Hatton et al.).

Decreased risk of diabetes. For women without a medical history of gestational diabetes, each year of breastfeeding reduces the risk of developing Type II diabetes later in life (Hoddinott et al., 2008). For women who experience gestational diabetes, the risk of developing Type II diabetes is not diminished by breastfeeding (Ip et al., 2007).

Practices that Improve Breastfeeding Initiation

Use of evidence-based best practices related to breastfeeding can improve rates of breastfeeding initiation, exclusive breastfeeding at time of hospital discharge and breastfeeding duration (Broadfoot, Britten, Tappin, & MacKenzie, 2005; Manganaro, Marseglia, Mami, Paolata, Gargano, Mondello, et al., 2009). The following evidenced-based best practices influence breastfeeding initiation rates and breastfeeding exclusivity at discharge, even after controlling for confounding factors such as maternal age, maternal education level, marital status, and maternal nicotine use (Broadfoot et al.; Duyan Çamurdan, Özkan, Yüksel, Pasli, Eahin, & Beyazova, 2007).

Evidence-based Best Practices

Breastfeeding initiation policies. In order to support evidence-based best practices in breastfeeding initiation, policies must be established or updated to guide nursing practice. It is important to evaluate hospital nursing practices that are considered routine to determine if they interfere with establishing breastfeeding (Auerbach, 2000). Hospitals with clear breastfeeding policies are more likely to provide better breastfeeding

support services and have couplets with improved breastfeeding outcomes. (Rosenburg, Stull, Adler, Kasehagen, and Crivelli-Kovach , 2008).

Education for nurses and other healthcare practitioners. Nurses knowledge of breastfeeding initiation best practices is predictive of their support of breastfeeding in the hospital environment (Bernaix, 2000). Because many nurses state they support breastfeeding but have clear knowledge deficits related to evidence-based breastfeeding initiation practices it is important to provide education to nurses in an accessible format. Hospitals who implemented policies related to the Baby Friendly Hospital Initiative (BFHI) and provided registered nurses with 18 hours of education in breastfeeding initiation best practices had improved exclusive breastfeeding and overall breastfeeding rates as compared to hospitals without clear policies (Merten, Dratva, & Ackermann-Liebrich, 2005; Philipp et al., 2001; United Nations Childrens Fund and The World Health Organization, 2010).

Early and uninterrupted skin-to-skin contact. Early and uninterrupted skin-to-skin contact optimizes infant latch-on (Widstrom & Thingstrom-Paulsson, 1993), helps maintain infant body temperature (Bystrova, Widstrom, Matthiesen, & Ransjo-Arvidson, 2003), and positively influences long term breastfeeding success (Carfoot, Williamson, & Dickson, 2005). Immediate and uninterrupted skin-to-skin contact between mother and baby and early breastfeeding initiation may improve continued breastfeeding rates after hospital discharge (DiGirolamo, Grummer-Strawn, & Fein, 2003).

Without a clear policy about how to facilitate immediate uninterrupted skin-to-skin contact and breastfeeding within the first hour of life, infants often are taken away from the mother for assessment and bathing. This separation of mother and child may result in delayed onset of milk production, which further complicates breastfeeding initiation and makes the infant more likely to experience excessive weight loss during the first three days of life (Dewey, Nommsen-Rivers, Heinig, & Cohen, 2003a).

Infants who are placed skin-to-skin with their mothers and left there are likely to breastfeed during the first hour of life. This early breastfeeding is correlated with increased duration of breastfeeding (Bystrova et al., 2003; Carfoot et al., 2005; Moore & Anderson, 2006; Righard & Alade, 1990). The procedures that often separate mothers and infants, such as APGAR scoring, bathing the infant, Vitamin K injection, and administration of antibiotics to the eyes, are not necessary in the first hour of life. Indeed many of them can be accomplished with the infant on the mother's abdomen.

Rooming-in. Evidence-based hospital policy encourages the practice of rooming-in as much as possible, including at night. Rooming-in and frequent skin-to-skin contact improve long-term breastfeeding rates (Murray, Ricketts, & Dellaport, 2007). Rooming-in is associated with improved breastfeeding outcomes (Scott, Landers, Hughes, & Binns, 2001). Because separation from the mother during the night results in fewer feedings, rooming-in should be strongly encouraged. Mothers do not have improved sleep quality if their infants are removed from the room (Keefe, 1987).

Feeding on infant cues. Mothers who feed their infants on cue may have a more adequate milk supply and may breastfeed for a longer period of time (Daly & Hartmann, 1995; DeCarvalho, 1983). Infant feeding cues include rapid eye movement when sleeping, muscle tension, fidgeting movements, bringing the hand to the mouth, rooting, and crying. Because each infant has his/her own feeding needs, it is important to feed the infant on cue rather than on a time-based schedule (Kent, Mitoulas, Cregan, Ramsay, Doherty, Hartmann, et al., 2006). Infants who are fed on cue have a longer duration of breastfeeding (Daly & Hartmann, 1995).

Avoiding pacifier use. The use of pacifiers in the hospital setting has been shown to negatively influence breastfeeding success (Dewey, Nommsen-Rivers, Heinig, & Cohen, 2003b). Using pacifiers with healthy full term newborns also may be associated with latch and milk transfer problems (Barros, Victora, Semer, Silho, Tomasi, & Weiderpass, 1995; Silko, Tomasi, & Weiderpass, 1995). Additionally, a pacifier may soothe a hungry infant and thereby cause the parents to miss feeding opportunities. Because lactogenesis II, the stage of milk production where control of milk production is controlled by regular emptying of the breast and nipple stimulation, is facilitated by frequent stimulation of the breast the use of pacifiers may delay the onset of milk production and negatively influence long-term breastfeeding (Righard, 1998; Victora, Behague, Barros, Olinto, & Weiderpass, 1997). While pre-term infants may need pacifiers for self-soothing in order to conserve energy for growth, healthy term infants

have very few, if any, need for a pacifier in the first few weeks of life (The Academy of Breastfeeding Medicine Protocol Committee, 2008).

Because the research illustrates that infants who use pacifiers during early breastfeeding ultimately breastfeed for fewer weeks (Dewey et al., 2003b), it is important that hospitals not provide open access to pacifiers.

Discharge education and access to breastfeeding resources. Providing breastfeeding mothers with discharge education and anticipatory guidance can improve breastfeeding duration (Murray et al., 2007). Breastfeeding mothers who were given a phone number to call for breastfeeding help as part of discharge education were more likely to be breastfeeding at eight weeks than those who did not receive this information (Murray et al.).

Absence of formula advertising discharge packs. Formula company discharge packs (FCDP) are formula advertising disguised as “gifts” that hospitals provide to mothers at the time of discharge. An attractive diaper bag includes a container of formula and written material implying that breastfeeding and formula feeding are similar—a claim that, according to scientific evidence, is not true. Many hospitals have decided to eliminate FCDPs because their distribution implies that the hospital promotes and endorses the use of formula. FCDPs undermine a woman’s feeling of adequacy to nourish her infant through breastfeeding (Rosenberg, Eastham, Kasehagen, & Sandoval, 2008). The Rosenberg study determined that women who were given FCDPs at the time of

hospital discharge, even though they intended to breastfeed, may have discontinued exclusive breastfeeding earlier than they would have if they had not received formula and formula company marketing materials (Rosenberg et al.).

Factors Affecting Breastfeeding Success

The most significant decrease in breastfeeding rates occurs in the first four weeks after birth (Labarere, Gelbert-Baudino, Ayrat, Duc, Berchotteau, Bouchon, et al., 2005). The reasons reported by mothers for discontinuing breastfeeding include conflicting messages received from healthcare providers (Ekstron, 2005), perceived insufficient milk supply, poor latch/ milk transfer, sore nipples, and lack of confidence in their abilities to adequately nourish their infants (Ahluwalia, Morrow, & Hsia, 2005).

Mother's perception of milk supply. In a study by Dykes and Williams (1999), interviews were conducted with primiparous women at 6, 12, and 18 weeks postpartum related to their perception of the adequacy of their milk supply to exclusively nourish their infants. In this study the participants emerged into two groups: (1) the first group of women continued to become more empowered in their ability to feed their infants adequately by breastfeeding; (2) the other group of women was concerned that their breast milk was inadequate to nourish their infants. The group that perceived their milk supply to be inadequate expressed four major themes: (a) concern that they could not visualize the amount of milk their infants consumed at a feeding; (b) concern that their diet was inadequate to produce quality milk; (c) concern that they had received

conflicting advice from healthcare providers; and (d) concern that they had not received adequate breastfeeding support (Dykes & Williams).

Hospital nurses' knowledge about supporting breastfeeding. Birthplace nurses can facilitate breastfeeding initiation in a way that physiologically supports good milk supply and psychologically supports a mother's feeling of self-efficacy. Fetrick, Christiansen, and Mitchell (2003) found that well informed nurses can positively influence breastfeeding initiation and duration, and that a lack of nursing support and inconsistent messages about breastfeeding may have a negative influence. However, nurses may have little or no formal education in facilitating breastfeeding initiation or supporting breastfeeding duration (Riordan, 2005). The unfortunate result is that patients may receive conflicting advice and insufficient instruction in breastfeeding techniques from hospital-based nurses. A deficit in training for nurses in breastfeeding best practices will have a direct effect on the lack of consistent messages and care provided to breastfeeding patients, because nurses may lack the necessary knowledge and skills to support breastfeeding initiation (Al Nassaj , Al Ward , Al Awqati , 2004).

Preparation and assistance. McLeod, Pullon, and Cookson (2002) determined that women were less likely to continue breastfeeding if they lacked prenatal breastfeeding education and if they experienced breastfeeding problems. In this study, women answered questionnaires prenatally and at six weeks postpartum and four months postpartum. Women who did not feel they were adequately prepared prenatally, who did not feel that they received adequate help with establishing breastfeeding, or with

addressing the problems they experienced with breastfeeding, were more likely to have discontinued breastfeeding at four months. In addition, the women who discontinued breastfeeding expressed that they would have liked to have been able to breastfeed longer, and that they felt some guilt associated with stopping earlier than four months. The most frequent reasons cited in this study for discontinuing breastfeeding were “a hungry baby” or “my milk ran out” (McLeod, Pullon, & Cookson).

Breastfeeding support. According to the Pregnancy Risk Assessment and Monitoring System (PRAMS) data from 2000-2001, four percent of women stopped breastfeeding in the first week postpartum, 13% stopped within the first month, and 51% continued breastfeeding for >4 weeks. Women who were younger and had lower incomes were more likely to stop breastfeeding. The reasons they cited for discontinuation included sore nipples, inadequate milk supply, and the perception that the infant was not satisfied by breastfeeding. Breastfeeding support for women in the immediate postpartum period is necessary to prevent the perception of inadequate milk supply and to assist mother with assessing latch and milk transfer (Ahluwalia et al., 2005).

A literature review conducted by Dr. Cindy Lee Dennis in 2002, which reviewed studies published between 1990 and 2000, reported that many women discontinued breastfeeding because of perceived difficulties such as inadequate milk supply, latching difficulties, and sore nipples, rather than because of maternal desire to discontinue. Additionally, healthcare professionals can be an unhelpful source of breastfeeding

support when they are not adequately educated in breastfeeding initiation best practices and provide inconsistent support (Dennis, 2002).

Healthcare practitioner education. Women who receive verbal support, positive breastfeeding messages, (DiGirolamo et al., 2003) and care from educated practitioners are likely to have a longer duration of breastfeeding and report fewer breastfeeding difficulties (Labarere, Castell, Fourny, Durand, & Pons, 2003; Jose Labarere et al., 2005). Vittoz, Labarere, Castell, Durand, and Pons (2004) published findings of a 3-day intensive, in-person educational session for midwives, nurses, and physicians which found that education produced a moderate increase in the duration of breastfeeding in patients cared for after the education was conducted. The session included both didactic and hands-on education covering topics such as: risks of lack of breastfeeding, supporting breastfeeding with evidence-based breastfeeding initiation practices, how to address common breastfeeding problems, medication use during breastfeeding, and discharge education improved breastfeeding initiation rates, exclusivity rates and duration rates.

Hospital breastfeeding policies. Hospitals with clear breastfeeding policies are more likely to provide better breastfeeding support services and have couplets with improved breastfeeding outcomes (Rosenburg, Stull, Adler, Kasehagen, & Crivelli-Kovach, (2008). In addition, hospitals implementing policies related to the Ten Steps to Successful Breastfeeding of the Baby Friendly Hospital Initiative (BFHI) had improved exclusive breastfeeding and overall breastfeeding rates as compared to hospitals without

clear policies. The trend of improving exclusive and overall breastfeeding rates continued over each of the three years of the study (Gau, 2004).

Baby-Friendly Hospital Initiative. The United Nations Children’s Fund (UNICEF) and World Health Organization (WHO) instituted the Baby-Friendly Hospital Initiative (BFHI) to implement evidence-based best practices related to breastfeeding initiation and support (The United Nations Childrens Fund and The World Health Organization, 2009) because hospital breastfeeding support practices influence initiation and duration of breastfeeding (Gagnon, Guylaine, Leduc, Waghorn, & Platt, 2005). The BFHI promotes breastfeeding through 10 steps that relate to specific education topics for mothers and specific actions by staff to support breastfeeding (United Nations Childrens Fund and The World Health Organization, 2010).

The BFHI 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 breast milk, unless *medically* indicated.
7. Practice “rooming in”-- allow mothers and infants to remain together 24 hours a day.
8. Encourage breastfeeding on demand.

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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.
- (UNICEF/WHO, 2004)
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Mothers who delivered at BFHI hospitals have a higher rate of breastfeeding at two days and two weeks, longer exclusive breastfeeding and increased median duration of any breastfeeding (Merten, Dratva, & Ackermann-Liebrich, 2005; Rosenberg, Stull, Adler, Kasenhagen, & Crivelli-Kovach, 2008). A study using data from the Boston Medical Center (which primarily serves patients of low socioeconomic status) showed that implementation of the BFHI Ten Steps and subsequent designation as a Baby Friendly Hospital increased breastfeeding initiation rates from a baseline rate of 58% in 1995 (before BFHI) to 77.5% in 1998 and 86.5% in 1999 (Philipp, Merewood, Miller, Chawla, Murphy-Smith, Gomes, et al., 2001). Moreover, the exclusive breastfeeding rate for newborns delivered at Boston Medical Center increased from 5.5% in 1995, to 28.5% in 1998, to 38.5% in 1999. The initiation rate for breastfeeding in African American mothers increased after the implementation of the BFHI policies and practices, while the demographics of patients served at this hospital remained the same from 1995-1999 (Philipp et al.).

The PRAMS data indicate that breastfeeding duration rates increased in Colorado when mother/baby dyads experienced five specific BFHI practices: (1) breastfeeding initiation within one hour of birth; (2) baby fed breast milk only; (3) mother and baby

stayed together by rooming-in; (4) no use of pacifiers; and (5) parents were given a follow-up phone number upon discharge. However, only 20% of Colorado mothers surveyed experienced these five BFHI practices (Murray et al., 2007).

Formal Breastfeeding Education

The nurse, because of her frequent interactions with the patient, is uniquely positioned to provide information and support breastfeeding initiation through evidence-based best practices (Bernaix, 2000). However, a knowledge deficit exists for many practicing nurses (Chiu, Gau, Kuo, & Chung, 2003; Holaday, Karipis, & Spicer, 1999), and the amount of didactic and clinical breastfeeding education provided in undergraduate nursing programs is often inadequate (Spear, 2006). It is the role of the educational institution to teach students evidence-based best practices during their didactic education and to provide them with an opportunity to apply this knowledge under clinical supervision (Dodgson & Tarrant, 2007). In an intervention with Bachelor of Science in Nursing (BSN) students published by Dodgson in 2007, students who were provided with a 10-hour didactic education and an 8-week perinatal clinical rotation had improved knowledge and were more likely to associate breastfeeding with positive maternal and child outcomes.

Chiu et al. (2003) conducted research with student nurses who had recently completed their obstetric nursing education. A competency-based clinical exam developed by Chiu was administered to a randomly selected group of students, and the pass rate on this exam was 27%. The areas where student nurses needed additional

education included feeding cues, satiety cues, feeding positions, latching-on, and assisting the mother in safely removing the infant from the breast (Chien, Tai, Chu, Ko, & Chiu, 2007), indicating that students in a 2-year or a 4-year nursing program who are not yet RNs may not be adequately prepared by their didactic and clinical education to provide evidenced-based breastfeeding support to their future patients.

Lack of adequate evidenced-based knowledge content in obstetric nursing courses can lead to a knowledge deficit related to breastfeeding best practices (Hellings & Howe, 2004). This knowledge deficit can lead to inconsistent advice given to mothers when the student becomes a practicing registered nurse (RN). Chien et al. (2007) suggest that based on their survey of medical students and nursing students, breastfeeding education be added, or the content increased, in both medical school and nursing school curricula.

Some practicing maternity nurses report insufficient education and hands-on training in breastfeeding support. Most nurses and nurse practitioners acknowledge that “breast is best,” but many lack the evidence-based knowledge to support breastfeeding best practices. In a study conducted with nurse practitioners (NP), in which 95 NPs responded to a survey mailed to them that included questions about knowledge, attitude, and clinical practice, the NPs cited that personal experience was the most valuable source of information they used in their clinical practice, but they were unable to correctly identify common strategies for managing breastfeeding difficulties (Hellings & Howe, 2004). Healthcare professionals are not always adequately educated and trained to provide support to breastfeeding mothers (Smale, Renfrew, Marshall, & Spiby, 2006).

Currently there are few courses available to nursing students and nurses that adequately cover the topic of breastfeeding. In addition, the information found in many nursing and medical textbooks about breastfeeding often is outdated and incorrect (Philipp, McMahon, Davies, Santos, & Jean-Marie, 2007; Philipp, Merewood, Gerendas, & Bauchner, 2004).

Moreover, there are limited options available to registered nurses who desire to improve their knowledge and skills related to breastfeeding support. Many of the available options are not online or are not available in most areas of the country. The following is a brief list of programs designed to provide additional education about evidence-based best practices in breastfeeding initiation to registered nurses. The courses listed are offered online or regionally/nationally. This list does not include IBCLE preparation courses.

The Healthy Children's Center for Breastfeeding offers a bachelor's degree (BS), a master's degree (MS), and a doctoral degree (PhD) in Maternal and Child Health: Lactation Consulting, in conjunction with Vermont College and Union Institute. The Healthy Children's Center for Breastfeeding also offers an in-person course in various locations throughout the United States. After completing the course, the participant may take an exam to be designated a Certified Lactation Consultant (CLC) (<http://www.healthychildren.cc/>).

University of California at San Diego Cooperative Extension office offers a lactation educator training program which results in a designation of Certified Lactation

Educator (CLE). These classes are offered in person throughout California (<http://www.breastfeeding-education.com/>). The costs for the CLC and CLE courses are between \$700 and \$800.

One graduate course in Human Lactation is offered at Wichita State University, Wichita, Kansas. This course, designated N720, is a 3-credit online course available to graduate students who are interested in practicing in the area of lactation support (<http://janriordan.net/n720.php>). The cost for this course is approximately \$600.

Health e-learning offers an online baby-friendly education course. This course provides 20 hours of continuing education for registered nurses and meets the BFHI 18-hour education requirement (<http://www.health-e-learning.com>). The cost for this course varies depending on the number of nurses enrolled from one institution.

Lactation Education Consultants offers a 45-hour course that qualifies a practitioner as a certified lactation specialist (www.lactationeducationconsultants.com). These courses are offered regionally and cost approximately \$735.

Breastfeeding Outlook by Marie Biancuzzo offers a comprehensive lactation course over a four day period throughout the United States. The course provides 90 continuing education credits and the cost for this course is approximately \$1000.

The Lactation Consultant Comprehensive Update is offered annually in North Carolina and offers 33 continuing education hours. The cost for this 5 day course is approximately \$575.

While there are a limited number of courses that prepare nurses with basic breastfeeding support knowledge and skills, there are many courses that provide education and review for the International Board Certified Lactation Consultant Exam (IBCLE). Information about the IBCLE preparation courses can be found at website for the International Lactation Consultant Association website (www.ilca.org).

The lack of education and training for many student nurses and registered nurses poses the question of the best way to educate RNs about evidence-based best practices in breastfeeding initiation and support. Because the schedules of hospital-based nurses are varied, online education presents a unique opportunity to provide continuing education with limited impact on the nurses' schedules and other commitments (Chang, Hsiao Sheen, Chang, & Lee, 2008; Wilkinson, Forbes, Bloomfield, & Fincham Gee, 2004). The Chang study used ADDIE (analysis, design, development, implementation, and evaluation) to assess e-learning programs (ELP) and found that ELP can improve knowledge and clinical outcomes in nurses where there are time constraints and where nurses work varied hospital shifts (Chang et al.).

Wilkinson et al. (2004) found that, when comparing the pre- and post-test and group interview data in post-registration nurses who had no previous ELP experience, but who had enrolled in an ELP for one of four different topics offered, over two-thirds of the nurses who participated in the ELP completed the course and passed the learning modules. In the group interviews, the nurses reported that it was important to ensure that participants had access to help-desk support and that they had adequate technology to

support the ELP. The reported benefits of ELP in this study were the flexibility of the ELP and the resource-rich learning environment (Wilkinson et al.). The nurses did report that the online course was isolating (Wilkinson et al.); however, the addition of asynchronous discussion and an in-person practicum can overcome these limitations. Graduate student post-registration nurses who participated in online discussions had higher grades on assignments in the course as compared to the group that participated in face-to-face discussion, and the students' assignment grades were directly correlated with the number of discussions read and posted by the graduate student RN (Campbell, Gibson, Hall, Richards, & Callery, 2008).

Adult Learning Theory

In order to create effective online education for nurses, the Adult Learning framework can be applied to the development of the course content (Fidishun, 2009). The premises of the Adult Learning framework include the learner's need to know, self concept, experience, readiness to learn, orientation to learning and motivation to learn (Knowles, 1980).

The learner's "need to know" emphasizes the concept that adult students need to understand *why* they must learn a given concept in order to successfully learn the concept. Unlike pedagogy, wherein it is expected that a student will learn something merely because it is taught, the adult learner must understand why learning a concept is

important. Asking adult learners what they expect to learn and how they will apply it in their future work will enable them to identify their need to know (Fidishun, 2009).

The premise of “self-concept” emphasizes that the instructor in a course should help the adult learner create his/her own self-concept (Fidishun, 2009). Although in the student’s previous educational experience he/she may have been a dependent learner, self-concept learning means that the instructor’s responsibility is to create a course that helps the learner become self-directed and take responsibility for his/her learning.

The third concept is that of an adult learner’s previous experience. Adult learners come to a course with a significant amount of previous life experience (Knowles, 1980). Through reflective learning, assessing and re-assessing a set of assumptions (Mezirow, 1991), the adult learner is able to take the experiences he/she has and integrate them into the new information that is being learned.

The fourth concept of the Adult Learning framework is that of readiness to learn (Knowles, 1980). This occurs when the adult learner experiences a need to know certain information in order to cope with a day-to-day activity (Knowles). The material taught to adult learners in an online course should simulate a situation where they would need the knowledge or skill that is being taught (Fidishun, 2009).

The concept of “orientation to learning” is that adults often are problem- or task-oriented. In order to successfully teach new information in the e-learning environment, the information should be taught in a way that makes it evident how it will apply to the

learner's job and how it may help them with a problem or task. Online learning can employ the use of synchronous chat or asynchronous discussion boards that allow the learner to apply the concepts he/she is learning to a problem or task that is experienced at work, or to read about how others applied the knowledge to their problem or task (Fidishun, 2009).

The final concept is that of the student's motivation to learn. Some students may be motivated by a promotion or a pay increase upon completion of a course or degree, while others are internally motivated by increased job satisfaction or self-esteem. This sort of motivation can be created in an online course through breaking the learning into smaller modules so that the learner feels a sense of accomplishment, and by allowing the learner to help prioritize the concepts that will be taught (Fidishun, 2009).

When using the Adult Learning framework to create online courses, it is important that the instructor becomes the facilitator, and that the education is student-centered (Hewitt-Taylor, 2003). The online environment is becoming an increasingly popular venue for providing continuing education for RN to Bachelor of Science in Nursing (BSN) programs (Smith, Passmore, & Faught, 2009). In a study by Smith et al. to examine the challenges an instructor faces when teaching nursing courses online, Smith discusses the important features of an online course, including frequent small assignments designed to allow students to apply their knowledge, as well as thought-provoking discussions on the discussion board to allow students to apply their previous experiences. A student's ability to manage the technology required for an online course is

an important factor (Smith et al., 2009; Spangle, 2002). While these two studies do not directly discuss the use of the Adult Learning framework in online nursing courses, all of the important features of a successful online course are included when an instructor uses the Adult Learning framework to plan and deliver the online content. Using frequent short assignments applied the Adult Learning framework concepts of orientation to learning and readiness to learn; and using thought-provoking discussions on the discussion board that allow a student to apply his/her previous experiences applies the Adult Learning framework concept of the learners “need to know.” The Adult Learning framework is an appropriate theory for use in the development and delivery of online continuing education courses for nurses.

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CHAPTER 3

PERSPECTIVES OF HOSPITAL-BASED NURSES ON BREASTFEEDING

INITIATION BEST PRACTICES

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Abstract

Objective

To assess the variation in breastfeeding knowledge and practices of registered nurses in hospital maternity units and the informal and formal hospital policies related to the initiation and support of breastfeeding.

Design

This qualitative study employed a focus group approach to solicit perceptions of hospital-based nurses regarding breastfeeding best practices.

Setting

8 (state) hospitals stratified by SES and size served as settings to recruit participants for this study.

Participants

40 female registered nurses from labor and delivery (n=9), postpartum (n=13), labor and delivery/recovery/postpartum care (LDRP) (n=12) and neonatal intensive care unit (NICU) (n=6) comprised 8 focus groups.

Results

The majority of nurses reported being knowledgeable of evidence-based best practices related to breastfeeding initiation. However, in non-Baby Friendly/Baby Friendly Intent (non-BF/BFI), nurses' knowledge often was not in accordance with current best practices in breastfeeding initiation, and reported hospital policies were not based upon evidence-based practices. Barriers to best practices in breastfeeding initiation included hospital lactation policies (formal and informal), nurses' limited education in breastfeeding initiation best practices, high rates of surgical delivery, and lack of continuity of care with the transition of responsibility from one nurse to another from labor and delivery to transition care to postpartum care.

Conclusions

A significant disparity between nurses' intention to support breastfeeding and their knowledge suggests there a need for education based on the World Health Organization Baby Friendly standards for nurses at non-BF/BFI hospitals. A significant barrier to supporting breastfeeding is lack of hospital policy and inappropriate or outdated policy.

Key Words (4): breastfeeding initiation; mother-baby nursing; baby-friendly; hospital policies

Introduction

Human milk is recognized as the ideal food for infants (International Lactation Consultant Association, 2000). The American Academy of Pediatrics recommends exclusive breastfeeding for the first six months of life, and then continued breastfeeding, in addition to complementary foods, for at least the first 12 months of life and beyond, if mutually agreeable (American Academy of Pediatrics Work Group on Breastfeeding, 2005).

Breastfeeding rates in the United States in 2006 were 73.9% in the early postpartum period, with 33.1% of women exclusively breastfeeding at three months and 13.6% exclusively breastfeeding at six months (Centers for Disease Control [CDC], 2009). These rates fall short of the Healthy People 2010 goals of 75% of women initiating breastfeeding in the early postpartum periods, with 60% of women exclusively breastfeeding their infants at three months and 25% exclusively breastfeeding through six months (Centers for Disease Control, 2009; Ip, Chung, & Raman, 2007). In Colorado breastfeeding rates are above the national averages, with 82.5% of mothers initiating breastfeeding in the early postpartum period, but only 49.2% exclusively breastfeeding at three months and only 22.6% of women reporting any breastfeeding at six months (Centers for Disease Control, 2009).

The United Nations Children's Fund (UNICEF) and World Health Organization (WHO) instituted the Baby-Friendly Hospital Initiative to implement evidence-based best practices related to breastfeeding initiation and support (United Nations Children's Fund

and The World Health Organization, 2010) , because hospital breastfeeding support practices influence initiation and duration of breastfeeding (Gagnon, Guylaine, Leduc, Waghorn, & Platt, 2005). The Baby Friendly Hospital Initiative (BFHI) promotes breastfeeding through 10 steps that relate to specific education topics for mothers, and specific actions by staff, to support breastfeeding. BFHI hospitals have a higher rate of breastfeeding at two days and two weeks, longer exclusive breastfeeding, and increased median duration of any breastfeeding (Merten, Dratva, & Ackermann-Liebrich, 2005; Rosenberg, Stull, Adler, Kasehagen, & Crivelli-Kovach, 2008). The Pregnancy Risk Assessment Monitoring System (PRAMS) data indicate that breastfeeding duration rates increased when Colorado mother/baby dyads experienced five specific BFHI practices: (1) breastfeeding initiation within one hour of birth; (2) baby fed breast milk only; (3) mother and baby staying together by rooming-in; (4) no pacifier use; and (5) parents being given a follow-up phone number upon discharge. However, only 20% of Colorado mothers surveyed experienced these five BFHI practices (Murray, Ricketts, & Dellaport, 2007).

Fetrick, Christiansen, and Mitchell (2003) found that well informed nurses can positively influence breastfeeding initiation and duration, and that a lack of nursing support and inconsistent messages about breastfeeding may negatively influence breastfeeding initiation and duration. However, many nurses have little or no formal education in facilitating breastfeeding initiation or supporting breastfeeding duration in their patients (Riordan, 2005). The deficit in education for nurses in breastfeeding best practices may have a direct effect on the lack of consistent messages and care provided to

breastfeeding patients, because nurses may lack the necessary knowledge and skills to support breastfeeding initiation (Al Nassagj, Al Ward, & Alwaqati, 2004; Freed, Clark, Harris, & Lowdermilk, 1996). Mothers state conflicting advice from caregivers as a primary reason for discontinuing breastfeeding (Ekström, Matthiesen, Widström, & Nissen, 2005).

Methods

Study design

The purpose of this study was to assess the variation in breastfeeding knowledge and practices of registered nurses in hospital maternity units and the informal and formal hospital policies related to the initiation and support of breastfeeding. This qualitative study used a purposeful 2x2 cross section sample to compare large to small hospitals, and high socioeconomic status (SES) to low socioeconomic status hospitals. Institutional Review Board (IRB) approval was granted by Colorado State University, Metropolitan State College of Denver, and each of the participating hospitals.

Focus groups

Standard techniques as described by Krueger and Casey (2000) were used in the development, implementation, and analysis of the focus groups to provide in-depth qualitative data. The focus group questions, developed by a team of experts in breastfeeding initiation who reviewed the literature and project objectives, addressed the following: hospital-policy (formal and informal) regarding breastfeeding; nurses' attitudes about breastfeeding and knowledge of current breastfeeding best practices for the first 72 hours of life; and hospital-policies and actual practice of observing and

documentation of breastfeeding (see Table 1). The questions were reviewed by a registered nurse (RN) and three International Board Certified Lactation Consultants (IBCLC) to confirm content validity.

Locations and participants

In Colorado, 57 hospitals/hospital systems reported providing childbirth services in 2007. These institutions were placed in one of four categories (11 could not be categorized and were eliminated from the pool): large, high SES (> 2200 births per year and < 25% Medicaid births); large, low SES (> 2200 births per year and \geq 35% Medicaid births); small, high SES (\leq 1500 births and < 25% Medicaid); and small, low SES (< 1500 births per year and \geq 35% Medicaid births) In each category, two hospitals were randomly chosen to take part in the study. One of the hospitals in the large, low SES category was a BFHI facility and, through the focus groups, it was discovered that several of the other participating hospitals were in the planning stages of the BFHI process (United Nations Childrens Fund and The World Health Organization, 2010) (see Table 2).

Participants were recruited by posting flyers in each hospital, emailing nurses, and signing up nurses in person during the shift changes. Each participant was compensated with \$25 cash.

Data collection

The moderator was experienced in the administration of focus groups and an expert in breastfeeding education. An assistant took notes and each focus group was tape

recorded; tapes were transcribed verbatim. The transcription was verified for accuracy by the assistant while listening to the tape and following notes prior to analysis.

The lead author organized the data, analyzed each transcript for categories, themes and patterns of convergence or disagreement. To establish inter-rater reliability, a research consultant with expertise in focus group analysis and breastfeeding education independently analyzed and summarized three randomly selected focus group transcripts. After analysis, the researcher and the consultant compared their results and had virtually 100% agreement on major themes for each question.

Results

Each focus group had between four and ten participants, and each session lasted approximately 90 minutes. All participants (n=40) were female registered nurses who worked in labor and delivery (n=9), transition/NICU (n=6), postpartum care (n=13), and labor and delivery/ recovery/ postpartum care (n=12). The nurses all were RNs with associate's, bachelor's or master's degrees in nursing. More than half of the nurses had a Bachelor of Science degree in nursing (BSN), and three had a Master of Science degree in nursing (MSN). On average, the Baby Friendly/Baby Friendly Intent (BF/BFI) hospital nurses had 8.5 years experience, while the non-Baby Friendly/Baby Friendly Intent (non-BF/BFI) nurses had 12 years experience.

Although the researchers expected to see differences between large and small hospitals and/or high and low SES hospitals, the only substantial differences were noted between BF/BFI and non-BF/BFI hospitals. Results and discussions will focus on these differences under two major themes: hospital policies and nurses' knowledge and

practices related to breastfeeding. Hospital-policies and the nurses' lack of breastfeeding education were barriers to breastfeeding initiation, as were surgical delivery and lack of continuity of care in the transition of responsibility from one nurse to another (see Table 3).

Hospital policy

In the BF/BFI hospitals, breastfeeding initiation policies had recently been updated, enabling the nurses to follow evidence-based best practices. These policies in the BF/BFI hospitals included:

1. Care of breastfeeding mother with a healthy newborn: promote breastfeeding in the first hour of life; immediate and uninterrupted skin-to-skin; unrestricted breastfeeding; breast milk only or supplementation with human donor milk (HDM); rooming-in; teach feeding cues; provide appropriate discharge education; and discourage pacifier use for term infants.
2. Supplementary feeding of the pre-term and term newborn: health care provider's order necessary for supplementation; first choice for supplementation is mother's own expressed milk, the second choice is HDM, and the third choice is formula.

In non-BF/BFI hospitals, many nurses reported that they "don't have many policies" regarding breastfeeding, while others noted that their written policies had not been updated recently.

Nurses knowledge and practices

Nurses at both the BF/BFI and non-BF/BFI hospitals reported being supportive of breastfeeding. However, only those in BF/BFI hospitals actually reported practicing behaviors that are consistent with evidence-based best practices and thought the nurse was responsible for providing support, education, and hands-on help. While they relied on their lactation specialists for assistance, the nurses in BF/BFI hospitals viewed themselves as the primary contacts for questions related to breastfeeding initiation.

While reporting a “pro breastfeeding” stance, the actual practices that the nurses at non-BF/BFI hospitals reported were not evidenced-based breastfeeding best practices.

From my perspective, if I have a kid whose blood sugar is low..., I can't put baby to breast and expect the blood sugar to be raised within the normal limits... but I can [expect an increase in blood sugar] from formula. (non-BF/BFI hospital)

When asked what the evidence-based practices were as related to breastfeeding in the first 72 hours of life, nurses' answers varied substantially. Nurses in the BF/BFI hospitals accurately reported the following as evidence-based best practices:

- Perform APGAR rating and physical assessment with infant on the mother's chest
 - Keep mother and baby in full body skin-to-skin contact
 - Delay physical assessment until after first feeding if the infant is clinically stable
 - Delay bath until after the first breastfeeding is complete
- Encourage unrestricted breastfeeding and use of breast milk only

- Keep mother and baby in the same room
- Educate parents to avoid pacifiers with term infants in the first few weeks of life
- Encourage family and visitors to leave if mother of child needs help with breastfeeding
- Provide discharge education to include where to call for help with breastfeeding

At non-BF/BFI hospitals, the nurses discussed that breastfeeding was the ideal or “gold standard” for feeding an infant, but had varied, non-evidenced practices related to how they supported breastfeeding.

Skin-to-Skin and Initiation of Breastfeeding Within the First Hour of Life Policy

The BF/BFI hospitals’ policies clearly supported current evidence-based best practices, and promoted immediate and uninterrupted skin-to-skin contact at birth and until first breastfeeding occurs, infant self-attachment at first and subsequent feedings (with nurse support if needed), and first breastfeeding in the first one to two hours of the infant’s life, including in the recovery room for mothers who were stable following surgical delivery. “Our policy actually tries to encourage breastfeeding after a normal vaginal delivery within 20 minutes...after a C-section [surgical delivery], within an hour. And both of those are very achievable goals...” (BF/BFI hospital).

In these hospitals, the APGAR scoring is conducted by the nursing staff while the infant is on the mother’s abdomen, and the infant physical assessment is delayed until breastfeeding occurs—up to two hours according to one hospital policy. When asked

what occurs at the BF/BFI hospitals to manage the tasks that must be completed in the first hour after birth, they responded:

We don't do them [weights, footprints, vitamin K, and antibiotic eye ointment]...not in the first hour of life...Or you can do them while the baby is on the [mother's] chest.... For a lot of us, it's been a real learning experience.

(BF/BFI hospital).

At non-BF/BFI hospitals, many of the nurses reported that they “try” to encourage breastfeeding after delivery, but that the infants usually are removed from their mothers. Nurses reported “trying” to be supportive of breastfeeding, but “in this era of many, many time constraints, a lot of times it becomes an additional effort for the nurses, especially initially post partum. It has become increasingly difficult to be 100% supportive of that mother and you say, you try for so long, and then you have to be done” (non-BF/BFI hospital).

Nurses' knowledge and practice

Nurses at the BF/BFI hospitals were aware of the physiological properties of breast milk and that skin-to-skin improves an infant's temperature and blood sugar regulation. “Skin-to-skin provides thermal regulation, regulates glucose levels in the baby, and promotes a successful breastfeeding experience.” (BF/BFI hospital nurse).

At non-BF/BFI hospitals, most nurses put the baby skin-to-skin for less than five minutes, then take the baby away for transition, which includes physical assessment, vitamin K administration, eye antibiotic ointment, and cleaning, prior to being swaddled in a blanket and given to the mother for breastfeeding. “I think it is best for the baby to

be skin-to-skin, but it never happens...because they're [mothers] in gowns, and then there are blankets [swaddling the infants]..." (non-BF/BFI hospital).

Breast Milk Only

Policy

At BF/BFI hospitals, HDM is available for any medically necessitated supplementation and use of HDM is part of standing supplementation orders. Policies state that a health care provider's order is necessary for formula supplementation when latch and milk transfer are not evidenced within 10-12 hours after birth (Academy of Breastfeeding Medicine, 2009). One participant reported "If not feeding effectively, the infant can be supplemented with the mother's breast milk, HDM or formula, in that order of preference." (BF/BFI hospital)

The supplementation policy dictates at what time we start considering and under what circumstances we start considering supplementation, and what we do in that process. We do have donor milk at this hospital. That is our first [choice] ...for supplementation, besides mom's milk, of course, if that were available. We do have formula, as well, but we do try to promote the donor milk over formula. (BF/BFI hospital).

The policy clearly specifies only supplementing those infants with hypoglycemia who are unresponsive to breastfeeding, newborns who demonstrate clinical evidence of dehydration, infants with hyperbilirubinemia, or those who are ineffective at transferring milk.

In non-BF/BFI hospitals, the nurses did not discuss having a policy on supplementation, and in most of these hospitals the amount, types, and criteria for supplementation were up to the individual nurse. A nurse reported that, at her hospital: “Some nurses are like, Oh, that baby didn’t eat, so I stuck in a little formula. He’s so much happier, and the mom can sleep better.” In addition, sugar water or formula is used for supplementation. Another nurse reported, “It’s a mother’s choice. ...and a lot of them say, ‘Bottle feed [formula feed] the baby tonight.’” This nurse reported that feeding formula at night is the norm.

Nurses’ knowledge and practice

The nurses at the BF/BFI hospitals reported primarily using human milk, either mother’s own pumped milk, or HDM, in the NICU. Nurses were aware of the research that supports exclusively using expressed breast milk (fortified or unfortified) with NICU babies to decrease the risk for necrotizing enterocolitis (NEC) and other diseases (Sisk, Lovelady, Dillard, Gruber, & OShea, 2007). In addition, the nurses clearly understood the medical indications for supplementation or use of expressed or HDM. “It’s very few babies in the NICU that we have given formula. A lot of us feel...there is actually a decreased incidence of NEC with using the expressed breast milk versus using the formula, which is why we try to promote it so much with—especially the premature babies” (BF/BFI hospital).

At non-BF/BFI hospitals, discussions about breast milk and formula seemed to refer to the two as equal, and even though the nurses stated that breastfeeding was the

“gold standard,” they allowed frequent supplementation with formula, regardless of medical need.

Nurses reported that, for the most part, they thought the other nurses at their hospital supported breastfeeding. However, they reported that there is a group of nurses who are just tired of hearing about breastfeeding.

Some of the nursery gals feel that it’s easier just to give a bottle to comfort these kids and get the feeding over with... And I see the attitude vary with how busy they are. So it just depends. But that attitude goes on. (non-BF/BFI hospital nurse)

These nurses also reported that night nurses, day nurses, and certified nursing assistants (CNAs) often have different practices related to breastfeeding initiation support. For example, several nurses from non-BF/BFI hospitals reported that infants were supplemented in the nursery at night rather than waking the mother for a feeding in order to “let mom sleep.” One nurse stated “I just think we need to be a little more on the same page, especially with the CNAs...and the night nurses.” All nurses in the focus group responded, “Yeah, yeah... the night and day nurses have totally different perspectives” (non-BF/BFI hospital).

Rooming-In

Policy

The BF/BFI hospitals had policies that encouraged rooming-in. One hospital renovated their birthplace to eliminate the well-baby nursery entirely; parents keep their newborns with them for 24-hour rooming-in. In this hospital, policies state that nurses

will educate parents that 24-hour rooming-in will enhance the initiation and establishment of breastfeeding.

In contrast, several of the nurses in the non-BF/BFI group reported that they encourage rooming-in, unless the mom is tired—and then they encourage sending the baby to the nursery. One participant said “Policy, we really don’t have a lot. We do have a rooming-in policy, but it’s mostly up to the mother... We try to do what the mother asks” (non-BF/BFI hospital).

A common theme at non-BF/BFI hospitals was the idea of “respecting mothers’/ families’ choices.” There was no encouragement for the nurses to educate mothers/parents about best practices and behaviors that would help them to be successful with breastfeeding.

Nurses’ knowledge and practice

Nurses at BF/BFI hospitals reported that they educate their patients about an infant’s nocturnal feeding schedule and view nights as an excellent, quiet opportunity to help a patient with latch and assess milk transfer.

Keeping that baby in the room, I think is really important. I know mom just had a 12-hour labor and she’s exhausted. But again, the evidence has shown that even tired moms, if that baby is in the room... will sleep much better [than] if her baby is out of the room. (BF/BFI hospital nurse).

At non-BF/BFI hospitals, the nurses often stated that, while rooming-in is encouraged, they often take babies to the nursery during the night at a patient’s request without providing education about infant nocturnal feeding patterns. The most frequent

reason for taking the baby to the nursery was to “give mom a break” or “allow mom to get some sleep.” One nurse commented “I would say that the majority of our babies actually stay in the nursery at night, that the majority of women don’t want it [rooming-in]” (non-BF/BFI hospital).

Pacifier Use

Policy

In BF/BFI hospitals, pacifiers were not routinely provided and, if pacifiers were requested by the parent, education about pacifier use was provided (American Academy of Pediatrics Work Group on Breastfeeding, 2005; Howard & Wight, 2009). In non-BF/BFI hospitals, pacifiers were offered to babies with “strong sucks” and without parental education. At most non-BF/BFI hospitals it was reported that pacifiers were in the infant’s layette and they could be used at any time. None of the nurses at the non-BF/BFI hospitals reported any policy on the use of pacifiers with breastfed infants.

Nurses’ knowledge and practice

At the BF/BFI hospitals the nurses provided education about avoiding early pacifier use and supported the American Academy of Pediatrics recommendations (American Academy of Pediatrics Work Group on Breastfeeding, 2005). This education is important in light of recent findings supporting pacifier use to decrease the risk of sudden infant death syndrome (SIDS). AAP guidelines recommend delaying pacifier use in breastfed infants until one month of age when breastfeeding is well established (Kattwinkel, Hauck, Keenan, Malloy, & Moon, 2009). One nurse stated “We don’t encourage pacifier use [in healthy term babies]. If we give a baby a pacifier, we have to

write [in the chart] on the nurse's notes why we're giving the baby a pacifier, and we have to tell the mom that it can interfere with breastfeeding, and we have to document that we told them that" (BF/BFI hospital).

The nurses at non-BF/BFI hospitals were not well informed about pacifier use and its effect on successful breastfeeding.

Pacifiers are optional, it depends on the baby. If you have a baby with a very strong suck, a baby who is going to breast, you're going in there, you're checking on the mother, she has colostrum, this baby is latched correctly and is nursing for an hour....then maybe you have a baby with a strong suck, you'll ask them [the parents] how they feel about pacifiers... if you have a baby who is rooting and sucking and sucking their blanket and sucking their hand and most importantly sucking on their mom way past what I think is necessary, ... then that would be a reason why I would give a pacifier. (non-BF/BFI hospital).

This nurse never mentioned assessing milk transfer because the infant is exhibiting hunger cues after feeding. She assumed that the baby had a "strong suck" rather than that he/she wasn't transferring milk/colostrum and needed a feeding assessment.

Patient Education

Policy

The policies on patient education at the BF/BFI hospitals encouraged continual education throughout the hospital stay on topics including infant hunger cues, unrestricted breastfeeding, how to know if a newborn baby is getting enough to eat, delaying pacifier use, and normal infant feeding patterns, including frequent nocturnal

feeding. Patients were provided with a discharge education packet that covered all of these topics.

The nurses at the non-BF/BFI hospitals did not discuss any policy on discharge education. However, they indicated that a discharge patient education packet was provided to all patients. The nurses in the non-BF/BFI hospitals did not discuss the topics covered in the discharge education packet.

Nurses' knowledge and practice

BF/BFI hospital nurses reported consistent educational efforts within the first 24-72 hours, so that parents can recognize their newborn's feeding cues, and so they will know how to tell that their baby is getting an adequate volume of colostrum/breast milk, and how the mother's family can support breastfeeding.

[A parent should receive] the constant reinforcement that you watch your baby's cues for feeding and you feed at least every two to three hours. And the more time that baby spends on the skin in the first few days of life [the better]; the saying that is going around in our unit is, "Babies that stay at the restaurant eat more food. (BF/BFI hospital nurse)

At the non-BF/BFI hospitals, many nurses referred to assessing adequate breastfeeding by how many minutes the infant fed on each breast, rather than physiological cues in the infant and mother that indicate milk transfer. A nurse at a non-BF/BFI hospital stated "Optimal, I'd like to see your baby at breast 15-20 minutes on each side." There were very few references to teaching parents feeding cues or how to know when their baby was getting enough to eat.

Documentation

BF/BFI hospital nurses reported that they were required to observe and chart at least one feeding during every shift, but reported that the documentation is not in-depth or consistent enough, and that they lack an admission assessment of breast and nipples.

This is where we do have a problem. We do it [evidence-based practices] but we don't tend to chart it. And I don't know if that's because it's not clear what should be charted, or if it's charted in too many places (BF/BFI hospital).

But in the same discussion, one nurse addressed the deficiency by stating: "That would be a great education station [in-house education topic for yearly competencies]: "How do I document breastfeeding?" (BF/BFI hospital)

The nurses in the BF/BFI hospitals also reported that they were more likely to give a detailed report to the next nurse about breastfeeding rather than documentation about the feeding. "I think it happens verbally more than it does documentation-wise." All of the BF/BFI hospital nurses reported that they do actually observe and assist with at least one feeding per shift and use many breastfeeding charting systems and assessment tools, most often LATCH scoring which assesses the infant's latch, positioning, and audible swallowing, and the mother's comfort and type of nipple (Jenson, Wallace, & Kelsay, 1994), but they need additional education in how to effectively chart feedings.

At the non-BF/BFI hospitals, information about feedings came from different sources, and was not charted effectively. Many of those nurses reported that feedings usually were reported by a mother and not actually observed; milk transfer often was not assessed; and nursing staff viewed assessing and documentation about breastfeeding as

the lactation specialist's job. When asked if the nurse actually observes any portion of a feeding, one participant responded, "Realistically for me, I can't. I'm not going to sit here for half an hour and watch a baby breastfeed" (non-BF/BFI hospital).

Discussion

Rosenburg, Stull, Adler, Kasehagen, and Crivelli-Kovach (2008) found that hospitals with clear breastfeeding policies similar to those reported in the focus groups at the BF/BFI hospitals are more likely to provide better breastfeeding support services and have couplets with improved breastfeeding outcomes. Immediate and uninterrupted skin-to-skin contact between mother and baby, and early breastfeeding initiation, may improve continued breastfeeding rates after discharge (DiGirolamo, Grummer-Strawn, & Fein, 2001). Without a clear skin-to-skin policy, infants often are taken away from mothers for assessment and bathing. This separation of mother and child may result in delayed onset of milk production, which makes the infant more likely to experience excess weight loss during the first three days of life (Dewey, Nommsen-Rivers, Heinig, & Cohen, 2009). Infants who are placed skin-to-skin and left there are likely to breastfeed during the first hour of life. This early breastfeeding is correlated with increased duration of breastfeeding (Righard & Alade, 1990). At the BF/BFI hospitals, policy dictated that healthy, term infants be placed skin-to-skin until first feeding. The nurses understood how to assess the infant while he/she was on the mother's abdomen and, in many cases, were able to delay treatments until after the first feeding. Early and uninterrupted skin-to-skin contact optimizes infant latch-on (Widström & Thingstrom-Paulsson, 1993), helps the infant maintain body temperature (Bystrova et al., 2003), and positively

influences long-term breastfeeding success (Carfoot, Williamson, & Dickson, 2005). It is clear that in both the BF/BFI and non-BF/BFI hospitals, the nurses were aware of the importance of skin-to-skin and early first breastfeeding. However, only in the BF/BFI hospitals were the nurses aware of how to implement these practices and provide uninterrupted skin-to-skin until first breastfeeding in the first hour of life.

Clear hospital policy about infant supplementation is necessary and should include appropriate conditions for supplementation, the preferred type of supplement, and the amount to supplement. In the BF/ BFI hospitals, the policies clearly outlined indications for supplementation, along with volume and type of supplementation to provide. In the non-BF/BFI hospitals, the individual nurse determined when to supplement, what to supplement, and how much to supplement.

Infants who were fed only breast milk in the hospital had a higher rate of breastfeeding at eight weeks than those who were not exclusively fed breast milk (Murray, Ricketts, & Dellaport, 2007). Non BF/BFI hospitals often did not have HDM and, therefore, supplemented freely with formula. Several nurses were misinformed about the origin and use of HDM. The BF/BFI hospitals have HDM on site and the nurses understand how to appropriately use it. While both groups reported supporting breastfeeding, only the BF/BFI hospital nurses emphasized the use of mother's own milk as a first choice, HDM as a second choice, and formula supplementation as a last choice.

The use of pacifiers in the hospital setting has been shown to negatively influence breastfeeding success (Dewey, Nommsen-Rivers, Heinig, & Cohen, 2003) and may delay the onset of milk production (Righard, 1998; Victoria, Behague, Barros, Olinto, &

Weiderpass, 1997). Use of pacifiers in healthy, term newborns also may be associated with problems with latch and milk transfer (Barros, et al., 1995). Without a clear hospital policy to discourage pacifier use and encourage education of the mother about how early pacifier use negatively affects breastfeeding duration, nurses are more likely to inappropriately use pacifiers and negatively affect an infant's breastfeeding duration. At the non-BF/BFI hospitals, pacifiers are readily available in bassinets and could be used by parents without any education. The nurses at these hospitals were not well informed about pacifier use and its effect on successful breastfeeding or how to interpret the recent recommendations about pacifier use and the prevention of SIDS (The Task Force on Sudden Infant Death Syndrome, 2005). At BF/BFI hospitals, pacifiers were not available in the couplet's room, and if a mother requested a pacifier for her breastfeeding term infant, the nurse was required by policy to educate the mother about the effect of pacifier use during early breastfeeding and to document the infant's use of a pacifier.

Evidence-based hospital policies encourage infants' rooming-in as much as possible, including at night, to improve breastfeeding outcomes (Scott, Landers, Hughes, & Binns, 2001; Murray, Ricketts, & Dellaport, 2007). Nurses in post partum care should understand the reasons for encouraging rooming-in and that mothers do not have improved sleep quality if their infants are removed from the room (Keefe, 1987). At non-BF/BFI hospitals, the nurses stated that while rooming-in is encouraged, they often take babies to the nursery during the night at a patient's request without providing education about infant nocturnal feeding patterns. The most frequent reason for taking the baby to the nursery was to "give mom a break," or to "allow mom to get some sleep." At the

BF/BFI hospitals, rooming in was encouraged. Nurses provided education to patients who requested that their infants go to the nursery about infants' nocturnal feeding patterns and improved breastfeeding success when infants room-in. Nurses also educated parents about the research regarding improved maternal sleep when the infant is in the room. One BF/BFI hospital did not have a well baby nursery at all, which promoted rooming-in for all well babies.

A recent study indicates that mothers who receive frequent breastfeeding assessment and additional support during their hospital stay have a longer duration of breastfeeding (Asole, Spinelli, Antinucci, & Di Lallo, 2009). Nurses at BF/BFI hospitals reported observing and documenting at least one feeding per shift, while nurses at non-BF/BFI hospitals stated they did not have time to observe a feeding and relied on mothers' reports about adequacy of a feeding.

The nurse must observe a portion of the feeding in order to assess the latch-on and milk transfer (Mulford, 1992). Using a breastfeeding charting and documentation tool that has been previously validated, such as the LATCH scoring system (Kumar, Mooney, Wieser, & Havstad, 2006), Mother Baby Assessment (Mulford, 1992), Mother Infant Breastfeeding Progress Tool (Johnson, Mulder, & Strube, 2007), or the Breastfeeding Support Skills Tool, may improve exclusive breastfeeding and decrease nipple soreness in mothers (Woods, Dykes, & Bramwell, 2002). Each of these tools gives a numerical score to a feeding. The scoring elements include feeding cues exhibited by the infant, positioning, suck, milk transfer, and condition of the breast after feeding. There is some debate in the breastfeeding community about which observation tool is the most effective

in improving breastfeeding outcomes (Tsu-Hsin, Keh-Chung, Chung-Pei, Chia-Ting, & Ching-Lin, 2008). However, it is uncontested that observing, assessing, and documenting at least one breastfeeding per shift, and documenting this feeding using a hospital developed or established tool, would allow for consistency between nurses. It also presents an opportunity for the nurse to correct any potential problems and/or reassure the mother that she has adequate milk production. While nurses at the BF/BFI hospitals observed feedings regularly, nurses at both the BF/BFI and non-BF/BFI hospitals identified feeding assessment and documentation as an area where they needed additional education.

Clear hospital policy about providing discharge education is necessary to ensure that all breastfeeding couplets know whom to call and where to go if breastfeeding problems arise. Policy existed at the BF/BFI hospitals outlining the topics that should be taught throughout the couplet's hospital stay and during discharge education.

Mothers who received a phone number to call for breastfeeding help were more likely to be breastfeeding at eight weeks than those who did not receive this information (Murray, Ricketts, & Dellaport, 2007). Nurses at both the BF/BFI and non-BF/BFI hospitals reported providing a discharge education packet to patients, but only the BF/BFI hospitals reported providing anticipatory guidance to breastfeeding mothers. The nurses at the BF/BFI hospitals appeared to be more knowledgeable of the resources available both at the hospital and in the community, and more encouraging of patients using these resources.

Limitations

The primary limitation of this study was that it was conducted with a purposeful sample of hospitals and nurses in a single state. However, the number of focus groups (8) and nurses (40), as well as the consistency of comments across focus groups, support the conclusions.

Conclusions and Clinical Nursing Implications

The research team originally postulated that variations in breastfeeding knowledge and practices of registered nurses in hospital maternity units and the informal and formal hospital policies related to the initiation and support of breastfeeding would exist between large and small hospitals and between high SES and low SES hospitals. However, the only differences occurred between the BF/BFI hospitals and the non-BF/BFI. The nurses from both the BF/BFI and non-BF/BFI hospitals reported being supportive of breastfeeding. However, at the BF/BFI hospitals there were clear evidence-based policies about breastfeeding initiation, and the nurses understood how to support best practices. The non-BF/BFI hospitals lacked policies about breastfeeding, and the nurses lacked the knowledge of breastfeeding best practices necessary to support initiation.

The process of applying to become a Baby Friendly Hospital requires that the administration and management of a hospital support breastfeeding best practices, revise policies, create new evidence-based policy when necessary, and document formula cost and use within the hospital. The process also calls for adequate education of all hospital personnel on breastfeeding best practices (e.g., nurses receive 18 hours of education).

Simply going through this process, even if the hospital does not submit its final application for BFHI status, may improve nurses' knowledge, attitudes, and practices related to breastfeeding initiation and spur the development of clear practice guidelines and policies. Regardless of BFHI status, the labor and delivery, postpartum care, and NICU staff should receive continuing education on breastfeeding best practices.

At non-BF/BFI hospitals, not only were nurses less likely to know best practices and how to apply them, but even when they did know best practices, the lack of policy to support them led to *going with the flow*. Education about evidenced-based best practices in breastfeeding initiation is crucial to providing adequate care to breastfeeding couples. The following are recommendations based on the results of this study:

- When possible, a hospital should strive to attain the Baby Friendly Hospital designation. The process of becoming Baby Friendly requires that policies be created and updated to support evidence-based care of couples. In addition, nurses are required to complete 18 hours of breastfeeding education during the BFHI application process. During the application for BFHI status the hospital must create policies and provide education to support nurses' knowledge about the benefits of breastfeeding, rooming-in, breastmilk only, breastfeeding on demand, and providing limited access to pacifiers for term infants. This policy leads to the ability to provide evidenced-based care for the breastfeeding couplet.
- Because the BFHI mandates that hospitals pay for the formula they use throughout the hospital, the process of preparing to apply for BFHI designation also forces a

hospital to investigate the cost of formula and the availability and cost feasibility of using HDM.

- Since best practices indicate either expressed milk or HDM be the first choice for supplementation, and formula the last choice (Academy of Breastfeeding Medicine, 2009), Baby Friendly Hospitals need access to HDM, and formula use should be limited and monitored.
- If hospitals are unable to attain BFHI (Baby Friendly status), it is recommended that these hospitals explore the steps required by the BFHI. The hospital should create a task force to conduct policy revision, examine current and proposed documentation standards, and establish a plan to educate nurses based on the budget available (train the trainer or services provided by the hospital lactation staff). The Academy of Breastfeeding Medicine (bfmed.org) created a model hospital policy and individual policies regarding hypoglycemia, discharge education, supplementation, peripartum breastfeeding management, human milk storage, and use of human milk, that can be modified and adopted by hospitals. If it is unattainable to provide 18 hours of education to nurses, commit to some additional breastfeeding education during the next year for all nurses. It is also beneficial to examine the use of formula in the hospital, attainability of human donor milk, and the use of mother's own milk for supplementation (attained by hand-expression or electric/manual pump). If hospital policy is changed regarding evidence-based best practices and nurses are given education to support the policies changes, then quality of couplet care is improved regardless of BFHI status.

- The process of becoming Baby Friendly requires nurses to document (in the chart) evidence-based best practices related to breastfeeding initiation. Documentation of these nursing practices is an important step in documenting evidence-based care. This practice now becomes particularly important with the addition of exclusive breast milk feeding to the The Joint Commission (2010) perinatal core measure set. While Baby Friendly hospitals are required to chart practices related to the ten steps of the BFHI, hospitals do not chart in a consistent manner, and these data are difficult to extract from the charts to evidence the BFHI practices. Considering that most hospitals have converted to electronic documentation for nurses, a concerted effort should be made to standardize the requirement for documentation of breastfeeding. If evidenced-based breastfeeding behaviors were included in electronic documentation systems, documentation of each of these behaviors would become routine. Additionally, the presence of these behaviors in the documentation system would encourage and remind nurses to do each behavior.

Project results emphasize the necessity of educating nurses about breastfeeding initiation best practices. Both formal and informal hospital policies dictate nursing practices. As a result, directors of maternity units should write and implement policies to support breastfeeding initiation best practices and to ensure adequate documentation of these evidence-based practices. Regardless of a hospital's intent to acquire baby friendly status, adopting the Baby Friendly Hospital Initiative's gold standards of competencies, policies, and documentation would lead to better evidenced-based care for mothers and infants.

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CHAPTER 4
**IMPROVING BREASTFEEDING INITIATION PRACTICES OF REGISTERED
NURSES THROUGH ONLINE THEORY BASED EDUCATION**

Manuscript to be submitted to The American Journal of Maternal/Child Nursing

Abstract

Purpose

To determine if an online course and practicum changes the knowledge and behaviors of hospital-based registered nurses in relation to breastfeeding initiation best practices.

Study Design and Methods

An online course with an 8-hour practicum was delivered to a convenience sample of registered nurses. Data were collected from treatment and comparison groups before and after the course to assess change in knowledge and behavior. Interviews were conducted with management teams at three Colorado hospitals 12 months after nurses in their hospital completed the online course to measure changes related to breastfeeding initiation policies and practices.

Results

Treatment group nurses demonstrated an increase in knowledge though there was little change in nursing behaviors. However, there were statistically significant changes in nurses' behavior related to appropriate use of formula supplementation as evidenced by chart reviews ($p < .05$). The management team interviews indicated that two of the three hospitals had policy and procedure changes during the 12 months after nurses completed the online course.

Clinical Implications

The online course produced changes in knowledge but change in behavior did not occur as predicted. This is likely due to hospital policy and culture that must change to support breastfeeding initiation best practices. Once policy is changed, nurses are able to make behavior changes. The establishment of breastfeeding policies allow the environment of best practices to remain the "norm" even as nurses or nurse managers are replaced by other nurses.

Introduction

Human milk is well documented as the ideal food for infants (Davis, 2001; Horta, Bahl, Martines, & Victora, 2009). The American Academy of Pediatrics (AAP) and the American Dietetic Association (ADA) recommend exclusive breastfeeding for the first six months of life, and then continued breastfeeding in addition to complementary foods for at least the first 12 months of life and beyond, if mutually agreeable (American Academy of Pediatrics Work Group on Breastfeeding, 2005; Dobson & James, 2005).

Breastfeeding rates in the United States in 2007 were 75% in the early postpartum period, with 43% breastfeeding at six months and 22.4% breastfeeding at 12 months; 33% of women exclusively breastfed at three months and 13.3% exclusively breastfeeding at six months (CDC, 2010). These rates fell short of the Healthy People 2010 and fall short of the Healthy People 2020 goals (CDC, 2010).

Hospital Policy and Practices

Hospital breastfeeding support practices influence initiation and duration of breastfeeding (Gagnon, Guylaine, Leduc, Waghorn, & Platt, 2005). Hospitals with clear breastfeeding policies where nurses perform evidence-based best practices related to breastfeeding have improved breastfeeding initiation rates, rates of exclusive breastfeeding at time of hospital discharge, and breastfeeding duration rates (Broadfoot, Britten, Tappin, & MacKenzie, 2005; Manganaro, Mami, Paolata, Gargano, & Mondello, 2009; Rosenburg, Stull, Adler, Kasehagen, and Crivelli-Kovach, 2008). Hospitals that implement policies related to the Baby-Friendly Hospital Initiative (BFHI) Ten Steps to Successful Breastfeeding have improved exclusive breastfeeding and overall

breastfeeding rates as compared to hospitals without clear breastfeeding policies (Gau, 2004).

Baby-Friendly Hospital Initiative

The United Nations Children's Fund (UNICEF) and The World Health Organization (WHO) instituted the Baby-Friendly Hospital Initiative to implement evidence-based best practices related to breastfeeding initiation and support (United Nations Children's Fund and The World Health Organization, 2009). The BFHI promotes breastfeeding through 10 steps that relate to specific education topics for mothers and actions by staff to support breastfeeding. BFHI hospitals have a higher rate of breastfeeding at two days and two weeks, longer exclusive breastfeeding, and increased median duration of any breastfeeding (Rosenberg et al., 2008) .

Current Breastfeeding Education Available to Registered Nurses

The nurse, because of her frequent interactions with the patient, is uniquely positioned to provide evidence-based breastfeeding information and to support breastfeeding initiation (Bernaix, 2000). However, health care professionals are not always adequately educated and trained to provide support to breastfeeding mothers (Smale, Renfrew, Marshall, & Spiby, 2006). A knowledge deficit related to breastfeeding initiation best practices exists in practicing nurses (Chiu, Gau, Kuo, & Chung, 2003; Holaday, Karipis, & Spicer, 1999), and the amount of didactic and clinical breastfeeding education provided in undergraduate nursing programs is insufficient (Spear, 2006).

Lack of adequate evidenced-based knowledge content in maternity nursing courses can lead to a knowledge deficit and inconsistent advice given to mothers when the student becomes a practicing registered nurse (RN).

Breastfeeding education and annual assessment of breastfeeding competencies are also lacking for practicing birthplace and family care nurses. Most nurses and nurse practitioners acknowledge that “breast is best,” but lack the evidence-based knowledge to support breastfeeding best practices (Hellings & Howe, 2004; Weddig, Auld, & Baker, 2011). The CDC report that summarizes maternity care practices indicates that many hospital/nursing practices are not evidenced-based, and these practices may affect breastfeeding initiation and duration (Centers for Disease Control and Prevention, 2008). Nursing care practices have a significant influence on breastfeeding initiation, and many nurses report they lack knowledge, clinical skills, and confidence to support breastfeeding (Szucs, Miracle, & Rosenman, 2009)

The most significant decrease in breastfeeding rates occurs in the first four weeks after birth (Labarere, Gelbert-Baudino, Ayrat, Duc, Berchotteau & Bouchon, 2005). The reasons mothers give for discontinuing breastfeeding include conflicting messages received from healthcare providers (Ekstrom, Matthiesen, Widstrom, & Nissen, 2005), perceived insufficient milk supply, poor latch/milk transfer, sore nipples, and lack of confidence in their abilities to adequately nourish their infants (Ahluwalia, Morrow, & Hsia, 2005). Most of the reasons cited for discontinuing breastfeeding in the early postpartum period can be mitigated by providing education to nurses in breastfeeding initiation best practices.

The lack of available education and training poses the question of the best way to educate nurses to support evidence-based best practices in breastfeeding initiation. Because the schedules of hospital-based nurses are varied, online education presents a unique opportunity to provide continuing education that has a lesser impact on the work schedules and personal lives of nurses (Chang, Hsiao Sheen, Chang, & Lee, 2008; Smith, Passmore, & Faight, 2009; Wilkinson, Forbes, Bloomfield, & Fincham Gee, 2004).

The tenets of the Adult Learning Theory are an appropriate framework for use in the development and delivery of online continuing education courses for nurses. To create effective online education for nurses, the adult learning principles can be used to develop and direct the delivery of course content (Fidishun, 2009; Knowles, 1980). The need for additional breastfeeding education for nurses, and the convenience of online education, support the development of an online course in breastfeeding best practices for registered nurses using Adult Learning theory.

Study Design and Methods

Purpose

To determine if a one-credit online course (with an eight-hour, in-person practicum) results in changes in:

1. Knowledge of breastfeeding best practices and how to support best practices;
2. Behavior of hospital-based nurses in relation to breastfeeding initiation best practices.

Focus groups were conducted to assess the knowledge and practices of registered nurses relevant to breastfeeding initiation best practices. The focus groups were

conducted with nurses from eight hospitals throughout Colorado. During data analysis the emerging themes of the focus groups divided the hospitals into two different groups: Baby-Friendly hospitals and hospitals that had begun the process of becoming Baby-Friendly (BF/BFI), and those hospitals that did not have the Baby-Friendly designation and were not in the process of working toward the Baby-Friendly designation (non-BF/BFI). The formative focus groups indicated nurses at BF/BFI hospitals were knowledgeable of evidence-based best practices related to breastfeeding initiation. However, in non-BF/BFI hospitals, nurses' knowledge often was not in accordance with current best practices in breastfeeding initiation; nurses often reported hospital policies that were not based upon evidence-based practices, or they reported a lack of policy. Substantial barriers to best practices in breastfeeding initiation included lack of hospital policy and nurses' limited education in breastfeeding initiation best practices (Weddig, Baker & Auld, 2011).

In response to the documented need and the focus group data, a one-credit online course was designed to increase nurses' knowledge in the area of breastfeeding initiation. The course addressed barriers to breastfeeding, outcomes of breastfeeding for mother, child, and environment, and the role of the nurse in supporting breastfeeding initiation best practices. The course included an eight-hour practicum (clinical experience) in which the nurse participated in breastfeeding counseling along with a hands-on skills lab, and observed breastfeeding initiation support under the supervision of an International Board Certified Lactation Consultant (IBCLC).

Study Design

This study was a prospective pre-test/post-test design using a cohort of nurses as the treatment group and a separate cohort of nurses as the comparison group. Different hospitals were chosen to recruit nurses for the treatment and comparison group, rather than using nurses from one hospital and randomly assigning them to the treatment or comparison group to control for possible changes in the environment.

The treatment group was a convenience sample of nurses. Nurses were recruited for participation in the treatment group by sending flyers to every Colorado hospital that provides birthing services. The flyer advertised the course and requested participation in the study, explaining that data would be collected during the pre and post course time period. In addition, the researcher attended Maternity unit staff meetings at many hospitals to encourage nurses' participation. The treatment group nurses completed the pre-tests prior to receiving the online course log-in information to ensure that they were not exposed to course content prior to completion of the pre-test.

The nurses completed the course during the assigned six week time period, and then attended an eight-hour, in-person practicum with the online course instructor and an IBCLC. Many treatment group nurses also chose to complete a 4-hour lactation skills update with an IBCLC at their place of work after the course practicum was completed. Both the required practicum and the optional skills update had clearly established behavior related learning objectives. Upon completion of the course and practicum, the treatment group nurses took the post test. Submission of 18 continuing education credits (CERPs)

approved by the Colorado Nurses Association was withheld until the nurse completed the post test.

The comparison group was a convenience sample of nurses recruited from a purposeful selection of hospitals, based on size and socio-economic status (SES) in order to represent the majority of hospitals in Colorado. The comparison group hospitals were chosen from hospitals that did not have any treatment nurses. One hospital in the small/low SES group declined participation and the researcher was not able to find another small/low SES hospital willing to participate. The comparison group nurses completed the same pre and post tests used for the treatment group. Each control group nurse was compensated \$25 for her participation. Institutional Review Board (IRB) approval was granted by Colorado State University, Metropolitan State College of Denver, and each of the participating hospitals where chart review was conducted.

Intervention

The course content was created by the researcher in conjunction with a group (n=4) of independent consultants who are IBCLCs and experts in breastfeeding education for nurses. The course was piloted prior to the intervention with maternity nurses who were not involved in the treatment or control groups, and who provided anonymous feedback. The course was changed to incorporate more practical, hands-on content based on the pilot course feedback.

The course was taught using the WebCT© course delivery system. Within the online course there were six learning modules, each consisting of an animated multimedia presentation, course readings, a quiz on the content and readings, case studies, and an

asynchronous discussion board. The WebCT© course was available to the treatment group nurses until the in-person practicum was complete.

Process evaluation was conducted throughout the delivery of the course through anonymous feedback on the asynchronous discussion board. This information was used to make updates to all sections of the course, ensuring that all intervention nurses received the same course content. In addition, the instructor used the tools provided by WebCT© to track student participation in course content and discussion.

Data Collection

Data were collected from the treatment and comparison groups one month before and one month after the course to assess change in knowledge and behavior. Assessment tools included The Coventry University Breastfeeding Assessment (CUBA) that assessed knowledge (Dunn, Law, & Wallace, 2009); an online behavior survey created by the researcher; a hospital chart review to assess changes in nursing behaviors related to evidence-based breastfeeding initiation best practices; and interviews with nursing managers from hospitals where a cohort of treatment nurses participated in the intervention.

Data collection tools. The CUBA was created by faculty at Coventry University and is reliable and valid in testing a nurse's breastfeeding knowledge in the following areas: the value of breastmilk, demographics of couplets/mothers who are most likely to breastfeed and those with lower breastfeeding initiation rates, the anatomy and physiology of breastfeeding, positioning and attachment, breastfeeding difficulties and challenges, and supporting breastfeeding initiation best practices. Content validity was established by a review of all test items by qualified midwives. Internal consistency of

scales was established in the creation of this tool using the Kuder-Richardson 20 formula, and the overall alpha was .846. Concurrent validity for the CUBA was established by examining baseline difference between groups based on previous experience and education (Dunn, et al., 2009).

The online behavior survey assessed the change in the nurses' behavior related to breastfeeding initiation. The self-assessment used a likert scale (0-25%, 26-50%, 51-75%, 76-100%) to assess how often a nurse reported practicing certain behaviors associated with supporting breastfeeding initiation and duration during the first 72 hours of an infant's life. Examples include:

- With what percentage of your patients do you leave the infant skin-to-skin with the mother (uninterrupted) until first breastfeeding?
- With what percentage of your patients do you instruct the mother in: 1. frequency and length of feedings; 2. infant feeding cues; 3. hand expression; 4. delayed use of pacifiers?

The online behavior survey was reviewed by a group of IBCLCs (n=5) to establish face and content validity, and was piloted with a group of 15 labor and delivery, post partum, NICU, transition, and pediatric nurses, using test/retest to establish reliability.

The hospital chart review was conducted to assess specific nurse's behavior associated with breastfeeding initiation before and after completing the online course and in-person practicum in the treatment group. The chart review was conducted using a sample of 15 treatment nurses from hospitals with more than five nurses taking the course. The chart review with comparison group nurses was conducted using a random sample of 15

comparison nurses from three hospitals. Chart review was not conducted with every treatment and comparison group participant due to limited resources.

The Health Information Management (HIM) department at each hospital created a report with the name and medical record number of couplets (mother and baby) cared for by treatment and comparison nurses during the month before and the month after the course and practicum were completed (on average, the practicum occurred approximately one to two weeks after the six-week online course). Four pre and four post charts were randomly selected from each list. Charts were excluded if the infant was born by surgical delivery, if the infant was exclusively formula fed during the hospital stay, or if there were neonatal or maternal complications during or immediately after birth. An IBCLC from each hospital reviewed charts from each nurse from the period one month before the course was conducted and one month after the practicum was completed. The IBCLC evaluated at least two charts for each treatment and comparison nurse in the chart review subset from the pre-intervention and the post-intervention time period. The chart review was conducted by the hospital IBCLC (rather than the researcher) because the staff is more familiar with the electronic documentation system which varied from hospital to hospital. The researcher trained the IBCLCs in conducting chart reviews. In addition, the researcher randomly evaluated 5 charts at each chart review hospital in order to establish inter-rater reliability. The researcher and hospital IBCLCs had virtually 100% agreement using the chart evaluation tool.

In addition, management teams (three teams n=3, 4, 6, respectively) including charge nurses, labor and delivery/NICU unit managers, postpartum care unit managers, and directors at three of the treatment group hospitals, were interviewed one year after

the course and practicum about changes that had occurred related to breastfeeding initiation policies and best practices during the prior year. The hospitals were chosen for interviews because there was a cadre of treatment nurses (≥ 5) from that hospital large enough to potentially change the environment.

Data analysis. The online behavior survey and CUBA were downloaded into a spreadsheet and coded for analysis. The chart review data were coded and entered into an Excel spreadsheet. These data were checked for accuracy by two researchers prior to analysis. All data analysis was done using SAS software (SAS Institute Inc, 2000).

Chi square analysis was used to compare demographics of the two groups including education, recent breastfeeding education, years of experience, and lactation qualifications. Years of experience and lactation qualifications were collapsed, as several options had few participants. An analysis of covariance (ANCOVA) was used to analyze the pre and post knowledge data collected from the CUBA tool, the online behavior survey, and the chart review. The pre-test score was the covariate in the ANCOVA analysis of items. Scales were created for formula supplementation (3 items), assessment (5 items), and instruction behaviors (6 items). The cronbach alpha for these scales was .77-.88.

The management interview data were collected by taking notes during the interviews. The lead researcher organized the data and analyzed the notes for themes and patterns of convergence or disagreement. To establish inter-rater reliability, a research consultant with expertise in breastfeeding education independently analyzed and summarized all three interviews. After analysis, the researcher and the consultant

compared their results and had virtually 100% agreement on major themes of the interviews.

Results

The treatment group in this study consisted of Bachelor's or Master's prepared nurses, and had more participants who had lactation qualifications ($p < .02$) such as Certified Lactation Counselor (CLC), Certified Lactation Educator (CLE), and IBCLC. The treatment group also participated more recently in breastfeeding education ($p < .04$) other than this online course. This is likely due to treatment nurses' self-selection into this group because of their interest in supporting lactation (Table 2).

The objective of this study was to determine if a one-credit, online course (with an eight-hour, in-person practicum) led to changes in the knowledge and behavior of hospital-based nurses in relation to breastfeeding initiation best practices. The nurses in the treatment group demonstrated an increase in knowledge related to the Baby-Friendly Hospital Initiative standards ($p < .01$), indications of good positioning and milk transfer ($p < .05$), managing breastfeeding difficulties ($p < .001$), appropriate use of supplementation ($p < .05$), and overall knowledge score ($p < .001$), when compared to the control group (Table 1). The nurses in the treatment group demonstrated a change in behavior in the use of formula supplementation only when medically necessary, and also improved their documentation of formula supplementation and the medical indication for its use (LSM=2.7 treatment LSM=2.4 comparison $p < .05$) (Table 1). Analysis was later conducted using demographics as covariates; however, some differences between

treatment and comparison groups were lost on some items due to the small sample size and missing demographic data for comparison nurses.

According to the management interviews conducted with 3 hospitals one year after nurses from their hospital completed the online course and practicum, many policies and procedures changed during the previous 12 months. In two of the hospitals, the changes were driven by the nurses' desires for change towards evidence-based best practices. In addition, the establishment of breastfeeding policies allowed the environment of best practices to remain the "norm" (even as nurses or nurse managers left and were replaced by other nurses). The third facility was recently given model policy/best practices from the corporate level. While they planned to implement the practices and modify and adopt corporate policy to support these practices, they struggled with cuts to their lactation services budget and the issue of how to educate the nurses on implementing these policies and practices with no additional support or budget available.

Clinical Implications

The major contribution of this study is evidence that education of nurses related to evidenced-based breastfeeding best practices and changes in knowledge are not adequate to produce behavior change. Without a change in hospital policy and administrative support for these changes, a shift to evidenced-based care does not occur. This course clearly changed nurses' knowledge about breastfeeding best practices, but there was little change in behavior (self-reported or documented in hospital charting). In hospitals that are not Baby-Friendly, where policy is outdated or does not exist, it is difficult for nurses to change practice even when their knowledge of breastfeeding best practices improves.

Online education on breastfeeding best practices would likely be most effective if it was conducted during the evaluation and update of hospital policy and documentation standards.

If nurses are not required by hospital policy to observe a portion of a breastfeeding during each shift and document the observation, then it is often neglected even if a nurse has received education on how to assess a feeding and evidence milk transfer (Weddig, et al., 2011). If the nurse has changed his/her practice after receiving education and now observes and assesses a feeding during each shift, this is not evidenced in the charting because there is no place to document the observation and instruction. Most hospital documentation systems rely primarily on patient self-report of feeding success (Dewey, Nommsen-Rivers, Heinig, & Cohen, 2003).

A study published by Rosenberg et al. in 2008, reported that hospitals with comprehensive breastfeeding policies are likely to have better breastfeeding outcomes. In that study, which evaluated compliance of Baby-Friendly hospitals with several of the BFHI Ten Steps, many hospitals were found to be out of compliance in providing education to nurses and providers and establishing and updating hospital policy. Having a clear hospital policy, and training the staff to adequately implement these evidenced-based policies, was associated with an increase in breastfeeding at two weeks based on a bivariate analysis. When all factors were placed in a multivariate model, having clear written breastfeeding policy that was communicated to nurses was the factor associated with increased likelihood of an infant breastfeeding at two weeks (Rosenberg, et al., 2008).

In summary, if a nurse's knowledge changes related to breastfeeding initiation support best practices, but the hospital policy does not support or allow the associated behavior change, then the education cannot change behavior. Nursing education must be combined with hospital policy and documentation system changes in order to be effective in changing behavior.

Limitations

Because the subject sampling was purposive/self-selecting rather than random, it is difficult to apply these findings to all nurses and all mother-baby units throughout the country. The sample size of participants in the intervention is also small, further limiting wide application. Missing demographic data prevents some statistical modeling. The knowledge tool was likely not sensitive enough to measure the magnitude of knowledge change achieved by the participants. The self-report behavior tool needed to include behavior intent and attitude questions.

Conclusions and Implications

Online education and in-person practicum are an effective way to change nurses' knowledge of breastfeeding best practices. However, hospital policy must be revised to support evidence-based best practices prior to, or in conjunction with, providing education to nurses. In addition, standard documentation processes should be developed, not only to document that the behavior occurred, but to prompt the nurse to complete the behavior.

Hospitals should be encouraged to create a breastfeeding task force to review current policies and to evaluate nurses' levels of comfort with evidence-based best

practices in breastfeeding initiation. Nurses' baseline knowledge could be assessed by conducting a breastfeeding skills lab or during annual hospital competencies. Once policies have been reviewed and education level assessed, the hospital breastfeeding task force should aim to update outdated policies. The Academy of Breastfeeding Medicine provides evidence-based hospital policies that can be adopted and tailored to the needs of each hospital with minimal effort on the part of the hospital.

Once hospital policy has been updated, education should be provided to nursing staff (and physicians) using the 18-hour Baby-Friendly Hospital Initiative (BFHI) learning outcomes (United Nations Children's Fund and The World Health Organization, 2010). Even if the hospital has no intention of becoming Baby-Friendly, continuing education based on BFHI standards will lead to better evidence-based patient care.

Because the Joint Commission for Accreditation of Hospital Organization (JCAHO) has added exclusive breastmilk feeding to its core measures assessment (The Joint Commission, 2010), it is important to document that nurses have completed the breastfeeding initiation support behaviors required in the updated policy. For this reason, a hospital breastfeeding task force should then work with the Health Information Management (HIM) department at their hospital to develop charting tools that prompt the nurse to complete the breastfeeding support behavior and require the nurse to document the behavior. Maternal and child health care should be evidence-based and well-documented. For this reason, establishing a breastfeeding task force, updating hospital policy and documentation systems, and providing nurses and physicians with the necessary education to implement the new policy and documentation standard are necessary regardless of a hospital's intent to become Baby-Friendly.

Table 1

Characteristics of Sample According to Group

	Comparison group n=45 ¹	Treatment Group n=50 ²
Education	% (n)	% (n)
Associate degree	40% (10)	28% (14)
Bachelors degree	48% (12)	70% (35)
Masters degree	12% (3)	2% (1)
Unit		
Mom/baby	68% (17)	46% (23)
Labor and delivery	8% (2)	12% (6)
Neonatal intensive care unit or nursery	12% (3)	16% (8)
Labor/delivery/postpartum care	8% (2)	14% (7)
Other	4% (1)	12% (6)
Lactation Qualifications*		
None	92% (23)	62% (31)
Certified Lactation Counselor/Educator(CLC/CLE)	8% (2)	34% (17)
International Board Certified Lactation Consultant (IBCLC)	0% (0)	4% (2)
Recent Breastfeeding Education*		
CLC/CLE course	0% (0)	12% (6)
Hospital education	44% (11)	32% (16)
8 hours outside of hospital	8% (2)	28% (4)
None	48% (12)	28% (1)

¹25 reported demographic data²50 reported demographic data*= $p < .05$ according to chi square analysis

Table 2

Analysis of Covariance of Knowledge and Behavior Change Data¹

Variable	Treatment n=50	Control n=45
	LS means (SEM)	
Knowledge: (maximum score)		
Knowledge of the value of breastmilk (5)	3.4(.1)	3.1 (.2)
Knowledge of world health organization BFHI standard (5)	2.7 (.1)**	1.9 (.2)
Anatomy of the breast (8)	3.0 (.3)	2.7 (.4)
Knowledge of good positioning for breastfeeding (8)	5.3 (.2)*	4.6 (.2)
Knowledge of how to manage breastfeeding difficulties (18)	12.3 (.3)***	10.0 (.4)
Knowledge of appropriate supplementation protocol (6)	2.6 (.2)*	1.9 (.2)
Total (50)	29.4 (.7)***	24.7 (.9)
Total (not including anatomy-42 ¹)	26.2 (.5)***	21.8 (.6)
Behavior ² :		
What percentage of patients do you refer to a lactation consultant	3.1 (.1)	3.2 (.2)
How often do you supplement w/ formula as your first choice	0.7 (.1)	0.3 (.1)
Instruct on latch and milk transfer	3.3 (.1)	3.4 (.1)
Assess latch and milk transfer	2.7 (.2)	2.9 (.1)
Skin to skin	3.1 (.1)	3.3 (.3)
Continuous skin to skin	2.6 (.2)	2.5 (.2)
Self attachment of infant to breast	1.7 (.2)	1.9 (.2)
Delay treatments of Vitamin K and eye antibiotic until after 1 st feeding	2.8 (.2)	2.5 (.2)
Pacifier use	1.7 (.2)	1.9 (.2)
Education about pacifier's effect on breastfeeding initiation	2.8 (.2)	3.2 (.2)
Formula use	0.7 (.1)*	0.4 (.1)
Medical indication for formula use	1.7 (.2)	2.1 (.2)
Availability of human donor milk	2.5 (.2)	2.6 (.2)
Nurse documents pumping	3.0 (.2)	2.9 (.2)
Educate about pumping	3.5 (.2)	3.5 (.2)
Patient referred to lactation consultant	3.1 (.1)	3.3 (.2)
Scales ³ :		
Instruction in latch and milk transfer ⁴ (number of items=5)	3.3(.1)	3.5(.2)
Assess-pain with breastfeeding, nipple condition, risk of infant or mom for breastfeeding problems ⁴ (number of items= 6)	2.6(.1)	2.9(.2)
Documentation ⁵ :		
Formula supplementation only with medical indication	0.7 (.1)*	0.4 (.1)
Documentation of feeding assessment	0.6 (.2)	0.5 (.1)
Documentation of latch and milk transfer education	0.7 (.2)	0.6 (.1)
Infant was placed skin-to-skin post delivery	0.6 (.2)*	0.7 (.0)

¹=ANCOVA with pretest score as covariate

²=anatomy scores deleted from this subset

³=1=0-25% 2=26-50% 3=51-75% 4= 76-100%

⁴=cronbach alpha =.77-.88

⁵= 0=no 1= yes

*= $p < .05$

**= $p < .01$

***= $p < .001$

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CHAPTER 5
DISCUSSION, CONCLUSIONS AND RECOMMENDATIONS FOR
FUTURE RESEARCH

Discussion and Conclusions

The aim of this research was to determine if a one-credit online course (with an eight-hour, in-person practicum) results in changes in the knowledge and behaviors of hospital-based registered nurses in relation to breastfeeding initiation best practices. The original hypothesis of this study was that differences existed in knowledge and skill levels related to breastfeeding initiation best practices among nurses when comparing high socio-economic status (SES) hospitals to low SES hospitals, and when comparing small hospitals to large hospitals. These factors proved to be irrelevant. Actually, whether a hospital was designated as Baby-Friendly, had declared the intent to become Baby-Friendly, or had established a committee to investigate declaring the intent to apply for Baby-Friendly hospital status (BF/BFI), was the defining factor that led to increased knowledge of evidenced-based practices and the creation and implementation of policies to support those practices.

Formative Assessment

The data collected during the formative focus groups indicated that nurses wanted additional education about breastfeeding initiation best practices. Online delivery of education was the preferred method for additional learning, and most participants in the

focus groups indicated they would have access to high speed internet at home or at work, and they would have a computer with adequate ability to launch streaming video, audio, video clips, and asynchronous discussion. They also indicated that because much of their hospital charting is recorded using a computer, and all of their yearly hospital competency education modules are online, they had adequate computer skills necessary to complete an online course.

Submitting the research protocol for approval by multiple Institutional Review Boards (IRB) was one of the initial challenges of this project. Eight hospitals were involved in this study and, because the study continued over a four-year time period, each IRB approval was submitted for continuing review three times. It would have been more efficient and cost effective to apply to a multiple institution review board such as the Colorado Multiple Institution Review Board (COMIRB) or Western Institutional Review Board (WIRB) and request that all other institutions cede to COMIRB or WIRB.

Recruiting participants for the focus groups posed another challenge. Most nurses were not willing to come to the hospital on their days off. It was important to schedule the focus groups during the hospital change of shifts (7am or 7pm for most facilities) so that nurses could participate in the focus group at the end of their shift. It would have been beneficial to also hold focus groups during the night shift (10pm or 11pm) when patient care is less busy to increase the participation of night nurses. Ideally, participants in focus groups do not know each other and focus groups are held at a neutral location. The researcher mediated this issue by conducting the focus groups in a conference room away from the maternity unit and asking participants for strict confidentiality. Future focus groups could be held at a large, national maternal and child nursing conference

such as the Association of Women's Health, Obstetric, and Neonatal Nursing (AWHONN) annual conference in order to increase participation and representation of nurses from many states, allow for focus group participants who do not previously know each other, and to conduct the focus groups at a neutral site.

Intervention

The data collected before and after nurses completed the online course and practicum indicated that the online course produced changes in knowledge, but change in behavior did not occur as predicted. This is likely because nurses were unable to change their behaviors related to breastfeeding initiation best practices until the hospital policy and culture changed to support these behaviors. As evidenced by the management interviews, once policy changes were implemented, the nurses were able to make behavior change. In addition, the magnitude of the knowledge change may have been larger than what the CUBA tool was able to measure. Upon further examination, the treatment group nurses discussed the understanding of evidence-based breastfeeding best practices and desire to apply best practices at their hospital in the course asynchronous discussion board. However, the CUBA tool was likely not sensitive enough to measure the magnitude of knowledge change that occurred and the behavior tool lacked a behavior change intent component.

The process of admitting nurses to the college as non-degree seeking students and enrolling nurses into the online course presented a challenge. The advantage of completing the college enrollment process was hospitals provided treatment group nurses with tuition reimbursement for courses at accredited colleges and universities. However,

important administrative constraints were noted. Nurses who were educated in other countries had difficulty obtaining transcripts to prove that they held a bachelor's degree, which would allow them to bypass much of the enrollment paperwork. All nurses had to prove that their immunizations were valid prior to registering for the course, even though the course was conducted online. And many nurses did not accurately complete the college admittance application, which resulted in a large amount of administrative follow-up in order to register the nurse in the course. While this course can be offered through a college as continuing education without requiring that a nurse register as a student, the nurse often cannot request tuition reimbursement from the hospital for continuing education courses.

Although participants were made aware of the technology requirements necessary to take the online course, several nurses struggled with logging into online learning. Many needed to upgrade the versions of Adobe Flash Player, video software, and Adobe Acrobat they were using prior to beginning the course. In the future, it would be beneficial to contact nurses well in advance of the course to notify them of the minimum requirements for operating systems necessary to complete the course.

Multiple improvements can be made in the data collection instruments. Demographic data should have been collected from all participants before they were allowed to proceed with the survey. With additional funding, it would be beneficial to develop a knowledge and attitude change tool based on the online course curriculum. The tool used for this study was not sensitive enough to adequately measure the magnitude of knowledge change. Additionally, the CSU survey could include questions that allow a nurse to demonstrate a desire to change practice even if the policy in his/her hospital

prohibits actually changing practice. The behavior self-report tool would have provided more useful data if it included questions about behavior intent and attitudes towards breastfeeding best-practice behaviors.

The chart evaluation would be more effective and efficient if there were standardized charting tools in place to assess breastfeeding initiation and support provided by the nurse. The chart review then could be conducted by querying data using criteria established with the help of the Health Information Management (HIM) department of the hospital.

Recommendations for Future Research

Because undergraduate education in breastfeeding initiation best practices is insufficient (Philipp, McMahon, Davies, Santos, & Jean-Marie, 2007; Spear, 2006), and because continuing education for maternity nurses is usually based around required certifications such as pediatric advanced life support (PALS) and neonatal resuscitation program (NRP), nurses often are not adequately prepared to support breastfeeding initiation in the immediate post-partum period. In addition, even with education, it is difficult to change nurses' behaviors without changing policies to support breastfeeding initiation best practices and establishing mandatory charting to ensure that nurses are adhering to best practices. Future research should aim to educate stake holders/administrators along with nurses in order to change policy prior to or during the online course time period.

When possible, hospitals should strive to attain the Baby Friendly Hospital designation. The process of becoming Baby Friendly requires that policies be created

and updated to support evidence-based care of couplets. In addition, nurses are required to complete 18 hours of breastfeeding education during the BFHI application process. During the application for BFHI status the hospital must create policies and provide education to support nurses' knowledge about the benefits of breastfeeding, rooming-in, feeding breastmilk only, breastfeeding on demand, and providing limited access to pacifiers for term infants. These policies lead to the ability to provide evidenced-based care for the breastfeeding couplet.

Additional research is necessary to assess the outcomes for hospitals who do not desire to become Baby Friendly immediately (or not at all), but who do want to provide evidence-based best practices. The following research questions would be valuable to explore:

1. When conducting formative focus groups, is there a difference in knowledge of evidence-based best practices related to breastfeeding between Associate Degree in Nursing (ADN) and Bachelors' degree in Nursing (BSN) educated nurses? What is the knowledge level of Masters of Science in Nursing (MSN) educated nurses? What is the knowledge level of Certified Nurse Midwives (CNM)?
2. What is the effect of breastfeeding policy created at the hospital corporation level that is handed down to individual hospitals for mandatory implementation? Conversely, what is the effect of breastfeeding policy created at the individual hospital level that is driven by registered nurses? What type of education is needed for physicians, nurses, lactation staff, and managers to

support these policy changes? What would be the typical cost of this education?

3. What is the ideal hospital charting system relative to assessing breastfeeding support? Would it serve to prompt nurses to complete evidence-based behaviors which support breastfeeding initiation in their patients?
4. How is policy best changed in hospitals where nurses or administrators are resistant to change?
5. What are the benefits to a hospital of becoming “Baby-Friendly-like,” without becoming Baby Friendly? Becoming “Baby-Friendly-like” would mean changing policy and educating nurses on how to comply with the policy changes without applying for the designation of Baby-Friendly Hospital Initiative status if barriers to applying existed (cost, etc.).
6. How could this curriculum be accessed by nurses on a national level?
7. Should the project include an education component for administrators in order to help change the breastfeeding policies before or during the course? Could the curriculum include a hospital policy review and revision component for nurses also?
8. What type of evaluation tools would be necessary to measure change if this course along with a policy change component and a administration education component were conducted at a local and then national level? This study indicated that a more sensitive knowledge tool was necessary, the behavior self report tool would need to include attitude measures and intention to change measures, and a policy evaluation tool would need to be developed.

Standardized documentation procedures would also make chart evaluation more feasible.

9. Could this course platform be used to create online courses for physicians to meet the 4 hour BFHI education requirement?
10. Should an online breastfeeding continuation course be created for dietitians who work with couplets on breastfeeding duration?

Summary

Registered nurses report being supportive of breastfeeding, but often are not knowledgeable about breastfeeding initiation best practices. At non-Baby Friendly/Baby Friendly intent hospitals, nursing practices were not in accordance with evidence-based best practice. This led to the conclusion that registered nurses need additional education about breastfeeding initiation best practices. After conducting online education for nurses in evidence based best practices, it became evident that hospitals also need to create and update breastfeeding policies and develop a standard breastfeeding documentation process in addition to providing education.

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APPENDIX A
ADULT LEARNING THEORY TENANTS

Tenant of Adult Learning Theory	Application in Course
Learners “need to know” Why must the nurse learn best practices in breastfeeding initiation support?	In the first module, the students are asked to read the International Lactation Consultants Association (ILCA) clinical guidelines for the establishment of exclusive breastfeeding. This document includes information about why breastfeeding initiation best practices exist and how they can be applied to clinical practice. The document also includes justification through citing research studies for each evidence based support behavior.
Self concept Helping the nurse develop their own self concept as a self directed learner	Each 1 week module has readings, a PowerPoint with video and voice narration, an online quiz to assess learning, and an asynchronous discussion board. The nurse can complete these tasks at anytime during the week but they must be completed at the end of the week. They must also respond to other nurses’ discussion postings, but can choose which postings to respond to based on their own learning needs. Each module also includes additional reading that is not required for those nurses who want more depth of knowledge on a particular topic. The nurses were also encouraged to post clinical practice questions on the anonymous question discussion forum so they could receive feedback from the instructor and other nurses about situations where they still felt their lack of knowledge was a barrier to supporting breastfeeding initiation best practices. During the practicum the nurse can spend more time at the skills stations where they need the most direction and development.
Experiences:	During the first learning module and the first discussion, nurses are asked to consider the information they learned in their formal RN training, what they have learned through continuing education, from other nurses, and because the majority of maternity nurses are female, what they have learned from their own breastfeeding experience or lack thereof. It is important to identify what knowledge is evidence based and what is not, and then build on the evidenced based knowledge and dispel the non evidence based knowledge. During the practicum, nurses with more experience with a particular breastfeeding support skill are asked to share their information with other nurses under the instructor’s supervision.
Readiness to learn: What does the registered nurse need to know to cope with day to day activity?	In the first module the online lecture, which includes slides and the instructor’s voice in the background, asks the student to consider what questions they have on a daily basis related to breastfeeding initiation support. What do they know about supporting initiation and where do they find their skills suboptimal. They later anonymously identify their areas of suboptimal knowledge on the asynchronous discussion board and the instructor informs the nurse during which module they will learn how to address this issue. During the practicum, there are breaks in the content that allow nurses to ask questions about scenarios they encounter in their daily work lives and learn how to better support breastfeeding in these difficult clinical scenarios.
Orientation to learn:	Unit 5 includes information about how to “batch” breastfeeding support tasks to make the nurses’ job easier while supporting breastfeeding imitation best practices.
Motivation to learn:	Almost all hospitals recognized continuing education such as this course when awarding annual pay rises. In addition, teaching nurses how to support best practices while making their job easier provides motivation to learn because of increased competency and self esteem.

APPENDIX B
FOCUS GROUP CONSENT FORM

Focus groups to explore the nurses role in breastfeeding initiation

Informed Consent

The aim of conducting these focus groups is to determine what factors affect a nurse's ability to support breastfeeding in the first 48 hours postpartum. In addition, the focus groups will explore your level of comfort with a computer and online education.

What will I be asked to do as part of this research project?

You will be asked to participate in a group discussion with other nurses from Labor and Delivery, Nursery, and Mom/Baby units from your hospital.

How long will it take?

The focus group will take 60-90 minutes. Focus groups are small groups selected from a broader population and interviewed through facilitator-led discussions, for opinions and emotional responses about a particular subject

What if I have questions?

Any questions you have about the information can be answered after the focus group.

What are the benefits of participating in this research project?

There are no direct benefits to participating in this project. However, your responses to the survey will help the researchers determine the best way to educate nurses in Colorado about best practices in breastfeeding.

What are the risks of participating in this research project?

There are no foreseen risks of participating in this research.

Will anyone know my individual responses?

No. Your participation in the focus group is confidential. We ask that you not discuss the participant responses or the discussions you have heard during the focus groups. In addition, your name or the name of your hospital will not be connected in any way with the data. Your supervisor and hospital administration will not know whether or not you participated in these focus groups and your responses to the questions are completely confidential.

Do I have to participate?

No. Participation in this research project is voluntary. You may withdraw at any time without penalty.

What if I have questions or concerns about participating in this research project?

If you have questions or concerns you may contact Jennifer Weddig at (303) 556-3134 or weddig@mscd.edu. In addition, you may contact Dr. Jeff Forrest, Chair of the MSCD Human Subjects Committee at (303) 556-4380 or forrestj@mscd.edu. The guidelines for protecting the rights of human subjects that are in operation in this study may be found on the College web site: <http://www.mscd.edu> (go to: "For Faculty and Staff" under Faculty Resources).

Can I find out the results of this research project?

Yes. Once the focus group data have been collected and analyzed, you can request the results of the research by contacting Jennifer Weddig, CLC, MS, RD at (303) 556-3134 or weddig@mscd.edu.

By signing below I acknowledge that I have read the information, I'm age 18 or older, and I have received a copy of the consent form.

Signature

Printed name

Date

APPENDIX C
FOCUS GROUP QUESTIONS

RN Focus group questions:

We are attempting to gain a better understanding of the hospital environment relative to the initiation of breastfeeding. You have been invited to this discussion because all of you are nurses in labor/delivery, mom-baby, or the nursery.

Today we will be discussing the policies and other influences that affect breastfeeding initiation behaviors in your hospital. There are no right or wrong answers and we expect to hear differing points of view. Please feel free to share your point of view even if it differs from what others have said.

Before we begin, let me remind you of several ground rules. Please speak up and try to have only one person speaking at a time. We are taping the session because we do not want to miss any of your comments but you may be assured of complete confidentiality as no names will be linked to the specific comments. We are just as interested in negative comments as positive ones; at times the negative ones are more helpful.

Our session will last about 90 minutes with no formal break. The refreshments are on the counter and you know where the restrooms are. Feel free to leave the table for either of these or to stretch, but please do so quietly.

Let's begin by going around the table for this first question. Give your first name and briefly tell us how long you've been working in labor/delivery/mom-baby or nursery and what you like most about the job.

A .What is happening now in “your” hospital

Describe your hospital's policies related to breastfeeding.

How do nurses at your hospital view breastfeeding?

What's your perspective on the relationship between breastfeeding and formula feeding?

(Perception of formula and breastfeeding being equal)

What is your hospital's policy on supplementation? Pacifier use? Rooming in?

How do nurses at your hospital currently manage a breastfeeding dyad immediately after delivery/first feeding? How are they managed in the 1st 48 hours?

(Baby skin to skin after birth until first feed. Apgar scores?)

Discuss how breastfeeding dyads are observed and charted.

(What gets in the way of observing and/or charting?)

B. What is your interest in further education on breastfeeding?

What is your interest in further education on breastfeeding?

What areas of breastfeeding support do you want additional education in?

How would you prefer to learn new material about breastfeeding?

In person? Online? Combined?)

Would you (nurses) find an eight hour practicum with a Lactation Consultant to learn counseling skills, positioning, and problem management valuable?

(Would you have access to a IBCLC?

Would you like to spend 8 hours in one day or 4 hours in 2 days?)

What type of support or compensation would you expect/like from the hospital?

(compensate you for your time?)

How would getting CEU's affect your interest?

C. What is needed for you to participate in an on-line course?

Assuming an on-line course in breastfeeding initiation and support was offered, would you have access to computers?

(Where? At home? At work? New computers? High speed access? Run videos and powerpoint?)

Let's look at several aspects of an existing 1 credit course. (View/discuss powerpoints, videos, streaming voice, position statements, email, online discussion, and project guidelines.)

Feedback on each

D. (Wrap-up)

The purpose of this discussion is to identify typical hospital policies influencing the initiation of breastfeeding, nurses' interest in additional education on this topic, and specifically, interest in an on-line course. Given this purpose and what we've discussed today,

Is there anything else you would like to share with us?

Thank you for your time and insights.

APPENDIX D
HOSPITAL DEMOGRAPHICS

Hospital Demographics

Hospital Category	**Number of beds in hospital/ labor and delivery and postpartum care	**SES: Percent Medicaid Births	*Birth Volume/Year	Urban, Suburban, or Rural
Large high SES-	400/ 40	25%	2300	Suburban
	300/35	25%	2600	Suburban
Large low SES	400 beds/30	40%	2800	Suburban
	550 beds/50	45%	5000	Urban
Small high SES	60 beds/ 15	20%	1450	Suburban
	50 beds/15	10%	470	Rural
Small low SES	150 beds/20	60%	1800	Urban
	40 beds/ 5	65%	300	Rural

*number of beds rounded to nearest number by 10.

**rounded to nearest number by 5.

APPENDIX E
SUMMARY OF MAJOR FOCUS GROUP THEMES

Major focus group themes according to hospital status.

Themes	Hospital Status ¹
Hospital Policy	<p>BF/BFI –</p> <ul style="list-style-type: none"> • Clear written policies based on best practices including skin-to-skin contact, • Immediate initiation of breast feeding, • Supplementation use (formula last resort), • Rooming in, • No pacifier use with healthy term infants. Patients who requested pacifier required parent education to be given <p>Documentation-</p> <ul style="list-style-type: none"> • Some required documentation. • Many hospitals used the LATCH² tool to assess latch and milk transfer. <p>Non-BF/BFI –</p> <ul style="list-style-type: none"> • Few if any policies related to breastfeeding initiation <p>Documentation-</p> <ul style="list-style-type: none"> • Very few documentation requirements; depended on personal communication between nurses to track problems; • No mention of observing feedings, assessing milk transfer or using a formal assessment
Nurses knowledge and practices	<p>BF/BFI –</p> <ul style="list-style-type: none"> • Nurses reported being supportive of breastfeeding and knew evidence-based best practices. • Breastfeeding occurs in first 2 hours of infant’s life. • Immediate and uninterrupted postpartum skin-to-skin. • Delayed APGAR, bath, physical assessment until after first breastfeeding • Encouraged/required rooming in. Educated mothers about infant nocturnal feeding patterns and educated mothers that it is normal to have an infant wake to feed every few hours throughout the night. • unrestricted breastfeeding • Discouraged pacifier use. Education provided if pacifiers requested. • Observe and assess breastfeeding – more likely to assess latch, milk transfer, use a formal assessment tool such as LATCH • Patient receives education throughout their stay about infant feeding cues, how to know if the infant is getting enough, and anticipatory guidance. • Infant led feeding-no time limits on feeding, encourage mom to feed baby on demand. RN discusses that normal feeding is feeding as often as infant exhibits feeding cues. • Nurses requested further education on presenting consistent messages to patients and information about assessing milk transfer. BF/BFI nurses also requested information about consistent documentation. These are advanced knowledge topics. <p>Non-BF/BFI –</p> <ul style="list-style-type: none"> • Nurses reported being supportive of breastfeeding but did not have knowledge of evidence-based best practices. • Nurses reported the infant was placed skin-to-skin but upon further investigation the infant was often removed for weight and assessment and returned to the mother wrapped in a blanket. • often acquiesce to mother’s wishes without providing education • Baby to nursery so mom “can rest” • Use of formula to increase blood glucose or so mom “can rest” • APGAR, physical assessment takes precedence over breastfeeding initiation • Pacifiers commonly used and found in bassinets. • Rely on mom to report on breastfeeding success • Time at the breast measured (i.e. -15 minutes per breast, feed every 3 hours) • Requested additional education on basic topics such as “to touch or not to touch,” flat nipples, and safety of donor milk.

¹ BF/BFI = Baby Friendly or Baby Friendly Intent

APPENDIX F

RECRUITMENT LETTER TO DIRECTORS OF MOTHER BABY UNITS AT
COLORADO HOSPITALS

To whom it may concern:

Metropolitan State College of Denver is proud to announce that we will be teaching NUT 3900, "Breastfeeding in the Beginning: A Course for Maternity Nurses" one more time this year. The course will be offered **online** from **9/8/08- 10/20/08** and will provide **18 CERPs** for registered nurses and other healthcare professionals. The course will also include a 4 hour in person skills lab for nurses in the Denver Metro area and those who would like to travel to Denver.

This course was specifically developed for labor and delivery, postpartum care, NICU/ICN, and pediatric nurses. The focus of the course is strictly the management of breastfeeding initiation in the first 72 hours of life. The course is designed to teach nurses how to practice evidence based care in relationship to breastfeeding initiation and to teach nurses a "toolkit" of breastfeeding "tricks" to make their jobs easier.

Did you know research supports the idea that women/couplets who experienced immediate skin-to-skin contact and sufficient breastfeeding support expressed higher patient satisfaction scores? It is important that nurses are educated in breastfeeding initiation support.

This course is offered 100% online with a four hour in-person skills lab. The course runs 6 weeks and costs \$249 which is covered by tuition reimbursement at most hospitals.

I request that you contact me with any questions about the course and that you distribute the enclosed registration packets and flyers to interested nurses at your July and early August staff meetings.

In addition, we are offering a 10% discount on tuition to all hospitals who register 5 or more nurses.

I look forward to answering your question and thank you in advance for your help!

Jennifer Weddig, MS, RD, CLC

Associate Professor of Nutrition

Metro State

weddig@mscd.edu

APPENDIX G

COURSE ADVERTISEMENT

Do you ever wish you that you knew more about how to help your patients with difficult breastfeeding situations?



Build your skills and confidence by taking a course that will teach the current evidence-based practices in breastfeeding initiation. Metropolitan State College of Denver is offering a one credit online course aimed to improve breastfeeding initiation practices. The course will be offered **online** from 05/27/08 to 7/2/08. This course will be offered only to RN's from Labor and Delivery, Postpartum, NICU, and Pediatrics. The class will focus specifically on how to deal with breastfeeding couplets in the first 72 hours of an infant's life.

Please call 303-556-3134 or email Jennifer Weddig at weddig@mscd.edu if you are interested in taking this course. You will need to apply for admission to Metro State as soon as possible, once you have applied, email Jennifer Weddig and she will register you in the course. Your hospital may pay the course tuition and the course will provide 18 continuing education credits that can be used toward maintaining your certifications or towards the 18 hour Baby-Friendly Hospital Initiative education requirement.

APPENDIX H

STUDY CONSENT FORM

Participant Information Sheet

Project Description

I have been asked to participate in an educational research study. I understand that my participation in this study will be voluntary.

The purpose of this study is to determine if an on line educational course in conjunction with a 4 hour in person practicum will decrease barriers and prepare nurses with knowledge and attitudes that will enable them to support breastfeeding initiations.

There will be approximately 120 participants enrolled in this study at 8 sites throughout Colorado it is anticipated that I will participate in this research study for 10 weeks (6 week course and a follow up one month after completion of the course).

Procedures

This study will take place at Colorado, Wyoming, and Utah hospitals. Nurses will be split into two groups, one intervention group and one control group.

Group One, the intervention group, will be asked to participate in a six week online course. Group one will also be asked to complete a four hours skills lab and a four hour practicum with an IBCLC. This experience will be arranged by the course instructor. In addition, Group One will be asked to complete an online test before and after the course and a third online survey one month after completing the coursework. Group One members should also be aware that the researcher may review charts on couplets that they cared for before the course began and after the course ends

Group Two, the control group, will be asked to complete two online tests before September 8, 2008 and after again after November 20, 2008.. Each survey should take less than 15 minutes.

Group Two members will also be selected randomly to have charts reviewed

Discomforts and Risks

The study may include risks that are unknown at this time. There are minimal risks associated with my participation in this study. The risk associated with study is loss of confidentiality from your participation

Benefits

The benefits to the intervention group include learning about breastfeeding best practices and 18 hours of continuing education credit to the intervention group if you pass the course.

Cost to Subject

There is a cost of \$249 to Group1 for participating in this course. There are no costs for Group 2. If you drop the course, you must drop it within the first 2 weeks of the course for full tuition refund...

Subject Payment

The intervention group will not be paid. The payment to the control group include \$25 for their time.

Study Withdrawal

Taking part in this study is voluntary. You have the right to choose not to take part in this study.

If you choose to take part, you have the right to stop at any time. You can contact Jennifer Weddig at weddig@mscd.edu to withdraw from the course. If you withdraw from the course in the first two weeks, you will be refunded full tuition. If there are any new findings during the study that may affect whether you want to continue to take part, you will be told about them. You can also choose to complete the course and indicate that you do not want your data used in the study.

Invitation for Questions

The researcher carrying out this study is Jennifer Weddig. You may ask any questions you have now. If you have questions later, you may call Jennifer Weddig at 303-437-6961 You will be given a copy of this form to keep.

If you have questions regarding your rights as a research subject, please call the Colorado Multiple Institutional Review Board (COMIRB) office at (303) 724-1055.

Confidentiality

We will try to keep your research records confidential, but it cannot be guaranteed. Records that identify you and the consent form signed by you, may be looked at by the following people:

- Federal agencies that oversee human subject research
- Colorado Multiple Institutional Review Board
- The investigator and research team for this study
- The sponsor or an agent for the sponsor
- Regulatory officials from the institution where the research is being conducted, to ensure compliance with policies or monitor the safety of the study
- Other hospital Institutional Review Boards
- College faculty involved in data analysis

The results of this research may be presented at meetings or in published articles. However, your name will be kept private. You will also be asked to sign a separate authorization form. This form will explain who will have access to your protected health information.

AUTHORIZATION:

By checking these boxes, you are agreeing with the statements

- I have read this paper about the study or it was read to me. I understand the possible risks and benefits of this study.
- I know that being in this study is voluntary. I choose to be in this study.
- I know I can stop being in this study and I will still get the usual medical care. I will get a copy of this consent form.
- I agree to take part in the above study

If you have checked the four boxes above, please click 'next' to consent to take part and proceed to the demographic data page.

Participants name:

witness

APPENDIX I

COVENTRY UNIVERSITY BREASTFEEDING ASSESSMENT INFORMATION

CUBA Version 2 Blueprint

Knowledge area	No	Learning Outcome	Questions which would need to be adapted for non-UK settings*
The value of breast milk (Q 1-5)	1	Identify the impact of breastfeeding on maternal health	
	2	Demonstrate knowledge of the benefits of breast milk for babies	
	3	Identify the benefits of breast milk for babies born pre-term or sick	
	4	Identify the impact of not breastfeeding on maternal and child health	
	5	Demonstrate knowledge of the possible dangers of not breastfeeding	
Who breastfeeds? (Q 6-10)	6	Demonstrate knowledge of current breastfeeding rates in the UK	*
	7	Identify groups who are most or least likely to initiate breastfeeding	*
	8	Show awareness of the reasons why women choose to breastfeed or not	*
	9	Demonstrate knowledge of the timing of and reasons for discontinuing breastfeeding	*
	10	Show an awareness of the exclusivity of breastfeeding in the UK	*
Anatomy and physiology (Q 11-20)	11	Demonstrate knowledge of the anatomy of the lactating breast	
	12	Identify the role of hormones in the lactation process	
	13	Show understanding of the physiology of milk production	
	14	Show understanding of the physiology of milk ejection	
	15	Demonstrate understanding of the physiology underpinning the continuing supply of milk	
	16	Identify changes in the composition of milk during lactation	
	17	Demonstrate knowledge of breastmilk components that aid growth	

		and development
	18	Demonstrate knowledge of breastmilk components that help to protect the infant against infection
	19	Demonstrate an understanding of the process of increasing the milk supply and of relactation
	20	Show understanding of the reasons for continuing exclusive breastfeeding and delaying weaning
Positioning and attachment (Q 21-30)	21	Demonstrate understanding of the concepts of positioning and attachment
	22	Show understanding of the principles of effective positioning
	23	Demonstrate knowledge of the principles of effective attachment
	24	Identify ways in which the mother knows that her baby is optimally positioned and attached
	25	Distinguish between good and poor positioning and attachment
	26	Demonstrate knowledge of the suck cycle during breastfeeding
	27	Show knowledge of the practice and benefits of skin to skin contact
	28	Demonstrate understanding of the benefits and safe practice of bed-sharing
	29	Identify the possible maternal consequences of poor positioning and attachment
	30	Identify the possible infant consequences of poor positioning and attachment
Breastfeeding difficulties and challenges (Q31-40)	31	Demonstrate knowledge of the aetiology and management of insufficient milk
	32	Demonstrate knowledge of the causes and management of painful breasts and nipples
	33	Show knowledge of the signs, symptoms and management of thrush infection
	34	Identify the aetiology, management and complications of engorgement of the breast
	35	Demonstrate knowledge of the management of mastitis and breast abscess
	36	Identify the principles and safe practice of expressing and storing breastmilk
	37	Demonstrate understanding of the impact of and management of breastfeeding with inverted nipples

	38	Show awareness of the significance of tongue-tie for the breastfeeding dyad	
	39	Demonstrate awareness of the implications of HIV for the mother who wishes to breastfeed	
	40	Identify the principles of the safe preparation of formula feeds	
Supporting breastfeeding <i>(Q41-50)</i>	41	Demonstrate awareness of breastfeeding education for health professionals	*
	42	Show an awareness of the legislation supporting breastfeeding mothers returning to work	*
	43	Identify the requirements for certification as a lactation consultant	
	44	Demonstrate knowledge of a range of breastfeeding support organisations	*
	45	Show knowledge of government initiatives to support breastfeeding	*
	46	Demonstrate knowledge of the Ten Steps to Successful Breastfeeding	
	47	Demonstrate awareness of the Seven Point Plan for the Protection, Promotion and Support of Breastfeeding	
	48	Identify the process of Baby Friendly accreditation in the UK	*
	49	Show knowledge of the International Code of Marketing of Breastmilk Substitutes	
	50	Show knowledge of the UK legislative compliance with the International Code of Marketing of Breastmilk Substitutes	*

APPENDIX J

CUBA VALIDITY AND RELIABILITY DATA

Coventry University Breastfeeding Assessment (CUBA) provides an assessment of the following areas of breastfeeding knowledge:

The value of breast milk: knowledge of the value of breastmilk is essential to allow mothers to make informed choices regarding feeding and to encourage them to initiate and sustain exclusive breastfeeding for at least six months as recommended by the Department of Health and World Health Organization

Who breastfeeds? knowledge of those who are most and least likely to initiate breastfeeding and factors associated with giving up earlier than intended is valuable in addressing inequalities in breastfeeding and subsequent health and to assist in the targeting of resources

- Anatomy and physiology: a sound understanding of the anatomy and physiology of the breast is essential to equip those who give advice and support to breastfeeding mothers with the necessary knowledge and skills

- Positioning and attachment: knowledge regarding the principles of effective positioning and attachment is crucial for the initiation and maintenance of successful breastfeeding

- Breastfeeding difficulties and challenges: a comprehensive knowledge of common breastfeeding difficulties and challenges is essential for the prevention and early management of problems that may lead to further complications and the early discontinuation of breastfeeding

- Supporting breastfeeding: knowledge of local, national and international strategies to support breastfeeding in both hospital and community settings is valuable in the implementation and dissemination of best practice and the prevention of conflicting information

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APPENDIX K
NURSING DOCUMENTATION CHART REVIEW TOOL

Nursing Documentation

Chart Review Tool

Nurse's identifier number: _____

Pts medical record number: _____

	<i>Yes</i>	<i>No</i>	<i>RN/LC</i>	<i>NOT Doc</i>
Was the infant placed skin-to-skin after delivery?				
Did the infant attempt to breastfeed at this time?				
Did the infant breastfeed within 2 hrs. of delivery?				
Did the infant self-attach?				
Were treatments such as eye ointment, vitamin K, measurements & bathing delayed until after first feeding?				
Was the mother instructed in proper latch?				
Was latch observed by the nurse?				
Did pain occur during latch?				
Was nipple condition observed when baby detached?				
Was the mother instructed in frequency and length of feedings?				
Was mother instructed in infant feeding cues?				
Was infant awake and alert prior to, and during feeding?				

	Yes	No	RN/LC	Not doc
Did infant need stimulation to stay awake during feeding?				
Was the mother instructed in hand expression?				
Did mother demonstrate successful hand expression?				
Was mother instructed in different positions?				
Was position noted for each observed breastfeed?				
Was mother assessed for risk of breastfeeding problems, such as history of surgery, mastitis or poor/low milk supply?				
Was infant assessed for risk of breastfeeding problems such as near-term gestation, short frenulum or difficult delivery?				
Was infant ever given a pacifier?				
Was pacifier education provided to mother?				
Was infant ever given formula?				
Was there a "medical indication" for this formula?				
Were options discussed with mother such as donor milk & pumping?				
Did mother ever pump while in hospital?				
Was reason for pumping noted?				
Was pumping education provided to mother?				
Was a referral to a lactation consultant ever made?				
Was reason for referral noted?				

Chart review:

1. Infant's sex: Male Female
2. Infants gestational age: ___ weeks _____ days
3. Birth weight: ___ pounds _____ oz
4. Discharge weight: _____ pounds
5. >7% weight loss
 - a. Yes
 - b. No
6. Number of wet diapers in
 - a. 1st 24 hours: _____
 - b. 2nd 24 hours: _____
 - c. 3rd 24 hours: _____
7. Number and character(meconium or transitional stool) of bowel movement in
 - a. 1st 24 hours-#
 - b. 2nd 24 hours
 - c. 3rd 24 hours
8. Hospital: _____
9. Dates of patients hospital stay: _____
10. Date of chart review: _____
11. Chart review completed by: _____

APPENDIX L

NURSING BEHAVIOR SELF REPORT QUESTIONNAIRE

Improving Breastfeeding Initiation Practices Through Online Theory Based Education for Maternity Nurses

Jennifer Weddig, PhD, RD
 Metropolitan State College of Denver
 Susan Baker, EdD and Garry Auld, PhD, RD
 Colorado State University
 Comirb #-07-08987
 Rev date 10/15/07

On average:

How often do you place the infant skin-to-skin after delivery?	0-25%	26-50%	51-75%	76-100%	n/a
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How often do you allow for infant self attachment if possible?	0-25%	26-50%	51-75%	76-100%	n/a
--	-------	--------	--------	---------	-----

Were treatments such as eye ointment, vitamin K, measurements & bathing delayed until after first feeding?	0-25%	26-50%	51-75%	76-100%	n/a
--	-------	--------	--------	---------	-----

Comments about skin to skin:

How often do you instruct the mother in proper latch for first feed?	0-25%	26-50%	51-75%	76-100%	n/a
--	-------	--------	--------	---------	-----

How often do you instruct the mother in proper latch one day one?	0-25%	26-50%	51-75%	76-100%	n/a
---	-------	--------	--------	---------	-----

How often do you ask the mother if she experienced pain with breastfeeding?	0-25%	26-50%	51-75%	76-100%	n/a
---	-------	--------	--------	---------	-----

How often do you observe the nipple condition observed when baby detached?	0-25%	26-50%	51-75%	76-100%	n/a
--	-------	--------	--------	---------	-----

How often do you instruct the mother in frequency and length of feedings?	0-25%	26-50%	51-75%	76-100%	n/a
---	-------	--------	--------	---------	-----

Comments about latch:

How often do you instruct the mother in infant feeding cues?	0-25%	26-50%	51-75%	76-100%	n/a
--	-------	--------	--------	---------	-----

How often do you instruct the mother in hand expression?	0-25%	26-50%	51-75%	76-100%	n/a
How often do you observe a mother demonstrate successful hand expression?	0-25%	26-50%	51-75%	76-100%	n/a
How often do you instruct mother in different positions?	0-25%	26-50%	51-75%	76-100%	n/a
Comments about feeding cues, hand expression and positioning:					
How often do you assess a mother for risk of breastfeeding problems, such as history of surgery, mastitis or poor/low milk supply?	0-25%	26-50%	51-75%	76-100%	n/a
How often do you assess an infant for risk of breastfeeding problems such as near-term gestation, short frenulum or difficult delivery?	0-25%	26-50%	51-75%	76-100%	n/a
How often do you give an infant a pacifier?	0-25%	26-50%	51-75%	76-100%	n/a
How often is pacifier education provided to mother?	0-25%	26-50%	51-75%	76-100%	n/a
How often do you give infants formula supplementation?	0-25%	26-50%	51-75%	76-100%	n/a
How often is there a “medical indication” for this formula?	0-25%	26-50%	51-75%	76-100%	n/a
Do you discuss other options with mother such as donor milk & pumping?	0-25%	26-50%	51-75%	76-100%	n/a
Comments about pacifiers and supplementation:					
How often do you note/chart the reason for pumping noted?	0-25%	26-50%	51-75%	76-100%	n/a
How often do you provide pumping education provided to a mother who needs a pump?	0-25%	26-50%	51-75%	76-100%	n/a

How often do you refer to a lactation consultant?	0-25%	26-50%	51-75%	76-100%	n/a
---	-------	--------	--------	---------	-----

How often do you chart the reason for referral to a lactation consultant?	0-25%	26-50%	51-75%	76-100%	n/a
---	-------	--------	--------	---------	-----

Comments about referral to lactation:

Nursing Behavior Self Report Questionnaire

Directions: Please respond to the questions below, if the question does not apply to you please choose "n/a". As with all of the data that is gathered in this course, this data is confidential and will not be to anyone at your hospital of employment reported back.

What were the most important concepts you learned and how have you applied them in your work?

Updated 9/10/07

APPENDIX M

PRACTICUM OUTLINE

Station 1: LC in a bed with a doll (The points listed are to guide discussion.)

General Positioning and Latch-on – Give an over-view to small group and then:

The nurse will:

1. Ask mother if she is comfortable. Does she need to use the bathroom?
2. Assess the best position to use and explains it.
3. Use sufficient pillows/folded blankets to get the mother's back supported and the baby well supported at the correct height.
4. Show mother how to hold baby by the shoulders. [May suggest mother massage her breast a little to start the milk moving down.]
5. Place baby in mother's arms.
6. Show mother how to support her breast from the bottom ("make a shelf") and compress it with her thumb and forefinger parallel to the baby's lips. Continue breast support until baby is sucking rhythmically or as needed.
7. Separate baby's arms to hug the breast.
8. Assist mother to rotate baby's body toward mother's body.
9. Adjust baby so mouth is directly in line with nipple and latch-on will not necessitate bending head forward. (Neck is slightly extended.)
10. Hips are in the same plane as baby's head.
11. (Nurse) Grasp outer aspect of mother's breast to mirror mother's hand.
12. Instruct mother to tease lower lip to trigger the rooting reflex.
13. Place her opposite hand over mother's hand to help her rapidly bring baby to breast. When baby opens mouth widely with a root and has tongue down.
14. Tuck extra blanket or pillow under mother's wrist.
15. Point out what is going well, and that the baby's ear, shoulder and hip are in a straight line.
16. Evaluate latch-on. Describe:
 - Mother reports a tug on the nipple, but not pain – breast gives with each suck.
 - Mother reports increased lochia flow or uterine cramping during feeding (in the first several days post partum).
 - Mother reports thirst and feeling sleepy or relaxed during the feeding.
 - Nipple is round, not pinched when infant comes off breast.
 - At least one breast softens/lightens during feeding.
 - Infant's lips are flanged ("guppy lips") and cheeks are rounded (no dimpling).
 - Infant's arms and shoulders are relaxed during the feeding.
 - Infant begins feeding in bursts of 10+ suck/swallows at a time and slows down as the breast softens.
 - Swallows are heard by nurse, not smacking or clicking sounds.

Football Hold

1. Baby is positioned under mother's arm, far enough back that the lips are in line with the outer edge of the areola

2. Mother grasps baby by shoulders using the left hand with left breast or right with right breast, thumb and forefinger extended up the baby's neck behind the ears.
3. Baby can either lie beside the breast or be sitting facing the breast – nose and mouth in direct line with the nipple.

Across the Lap (Cross Cradle)

1. Baby is positioned across the mother's lap.
2. Mother grasps baby with hand opposite breast (left breast, right arm) by shoulders with thumb and forefinger extended up the baby's neck behind the ears.
3. Baby's hips are brought closer to mother's body to free nose if it is blocked.
4. Demonstrate switch to cradle hold.

Cradle

1. Mother scoops baby into crook of the arm on the same side as the breast (left breast, left arm), rolling the baby toward her on his side.

Sidelying

1. Mother is on her side with a pillow under her head, one at the small of her back and another one under her upper knee.
2. If her breast is at the bed she does not need a pillow under the baby, but, if the breast is higher, a pillow is placed under the baby.
3. Mother is assisted to come up on her forearm to grasp her breast and see what she is doing.
4. Baby is grasped with opposite hand and pulled to breast as he roots.
5. Once the baby is nursing rhythmically, mother may slide into a reclining position, supporting her baby in the most comfortable position for her.
6. ALTERNATE: Nurse puts baby on for mother and then adjusts mother's support so she can hold the baby safely.

Laid back nursing (additional topic by Amanda Ogden, RN, IBCLC)

□ **Station 2: Equipment (Use points to facilitate discussion – may be done in groups of 2-4.)**

Nipple Shields (Use all 3 sizes and breast models – pass around equipment to be handled and tested out.)

The nurse verbalizes/demonstrates:

1. Using a nipple shield incorrectly can be dangerous – baby may not be getting any milk. Therefore, when using a nipple shield the nurse should stay with the mother to observe first feeding.
2. The nipple shield is never the first intervention. First try:
 - a. Giving the baby time to figure out what to do
 - b. Holding baby skin-to-skin to see if he finds the nipple
 - c. Changing to a different position
 - d. Pumping to pull out nipple a little more
 - e. Wedging breast tissue

3. Nipple shield is almost never appropriate for sore nipples
4. Situations in which a nipple shield may be appropriate:
 - a. Baby having difficulty feeling the nipple far enough in mouth to start sucking
 - b. Baby humping tongue and pushing nipple out instead of latching
 - c. “Nipple confusion” after baby has been given a bottle
 - d. Preterm (34-38 weeks) baby having difficulty sustaining suck
 - e. Significantly receding chin
 - f. Cleft lip or palate (may be able to occlude the cleft with shield)
5. To use the shield:
 - a. Determine correct size looking at mother’s nipple diameter and baby’s mouth (nipple “sizer” may help)
 - b. Turn shield almost inside out to create a pull on the nipple
 - c. Elicit rooting, pull baby to breast
 - d. Look for latch to be same as straight on breast – not just on the teat of the shield
 - e. Check that baby’s lower lip is flanged out and breast is being pulled with each suck
 - f. Listen for swallowing, look for breast to soften, look for colostrum/milk in shield at end of feeding
 - g. Make sure the shield fits comfortably when the baby is sucking
6. Teach mother:
 - a. This is typically a temporary tool
 - b. How to start with shield and then take it off and try baby straight – this may not work for several days, but should be tried as deemed appropriate
7. After all of the above:
 - a. Chart that a nipple shield is being used
 - b. Make a referral for an LC consult

Hydrogels

The nurse verbalizes:

1. Hydrogels only work *if* causes of sore nipples, including incorrect latch and yeast are appropriately treated.
 - a. Describe appearance of poor latch and symptoms of yeast.
 - b. Assist mother with correct latch and work with baby until there is minimal to no pain.
 - i. Assist at next feeding or until mother can latch baby correctly on her own.
 - ii. Document trauma or suspected yeast and referral as appropriate.
2. Hydrogels have been reported to minimize the tenderness of early breastfeeding and are appropriate to use for a few days prophylactically.
3. We recommend hydrogels instead of lanolin (Lansinoh® or PurLan® are the most common brands) because yeast infections are so common with our high humidity and the oil in the lanolin fosters yeast growth.
4. Give mother one set of hydrogels to use when she is wearing a bra
 - a. Demonstrate use.
 - b. They can be rinsed with cool water if they get milky.

- c. They can be used for 5-6 days.
 - d. If she is still having pain and needs another set, she should make an appointment to see an LC who will help her problem-solve her pain and give her more.
5. Document use of gels on MOTHER'S Clinical Pathway.

Nursing Supplementer:

Nurse demonstrates/verbalizes:

1. When a nursing supplementer/dental syringe is appropriate.
 - a. Baby needs a little encouragement to start sucking (syringe & water)
 - b. Baby needs calories because of >10% weight loss or elevated bili
2. Assemble supplementer
 - a. 5 fr. gavage tube with tip cut off
 - b. 10 mL syringe (for a baby needing more supplement there are 20 mL syringes on the post partum supply cart)
 - c. may need to tape tubing in place on breast – tape lengthwise on tubing
 - d. OR acquire periodontal syringe from NBN
3. Demonstrate putting it on breast with about 1/8 inch sticking out past tip of nipple at about 10 o'clock or 2 o'clock
4. Use pumped colostrum if possible.
5. Document on BABY'S Clinical Pathway.
6. Make a referral to LC.

Station 3: Breast Pumps (Pass around kits for a lot of hands on- experience.)

Nurse verbalizes/demonstrates:

1. Hand pumps
 - a. Every breastfeeding patient is given a hand pump unless she verbalizes that she has a pump at home.
 - b. Putting together the pump, selecting the correct nipple flange and how to put the top plunger back in handle piece if it slips out.
 - c. How to wash parts and reassemble – point out directions in bag.
 - d. Storing milk – point out magnet in bag.
 - e. Breast pads – point out washable breast pads in bag and explain that they can be washed with the baby's clothes and reused.
2. Electric pumps
 - a. When used for brief time to pull out nipple, get colostrum for supplementer or relieve engorgement use ONE Ameda kit
 - b. When used to pump for a premie/sick baby, start with one Ameda kit and once mother is comfortable with pumping, offer to add the second one to decrease her pumping time.
 1. LC will give patients who are using a loaner Lactina pump the appropriate Medela kit.
 - c. How to select correct nipple flange for patient
 - d. How to wash parts and reassemble (both Ameda & Medela kits)– point out directions in bag
 - e. Give patient a wash basin for washing pump pieces to keep them out of the sink

- f. Tell patient to rinse kit in cool water before washing in warm water to keep milk protein from sticking to the plastic.
 - g. Pumping to establish a milk supply:
 1. wash hands before every pumping
 2. pump directly into volufeeder (it attaches to breast piece of pump)
 3. pump at least every 3rd hours starting within 12 hours of birth
 4. pump 10 minutes per breast; longer if milk is still flowing or breasts still feel full
 1. massage may help increase milk flow
 2. if double pumping, may want to turn off one side at end and massage each breast while pumping 2-3 minutes longer
 5. get volufeeders, lids and labels from baby's nurse in NCCC (can get a few from cart in NBN as needed)
 6. refrigerate milk or take to NCCC within 4 hours
 1. can put in a container of ice in her room until she goes to NCCC if necessary, or use NBN refrigerator
 7. Discharge Planning documentation should include plans for a hospital-grade electric pump at home.
 3. If patient is reporting pain with pumping, nurse can:
 - a. Show patient how to assure that nipple is centered in nipple funnel
 - b. Reteach that pressure gauge should be left at a comfortable level
 - c. Coat the inside of the breast and nipple flange with SurgiLube®
 - d. Use the hand pump (with hard, clear plastic) with the electric pump adaptor
 - e. Reconsider the fit of the flange and get a larger one if necessary
 - f. Match pump to kit being used (i.e. Ameda machine with Ameda kit and Medela machine with Medela kit)
 4. Document each pumping and all teaching on MOTHER'S Clinical Pathway
- Used with permission of Mary Overfield, MSN, RN, IBCLC and Mary Rose Tully, MPH, IBCLC.

APPENDIX N

POST-INTERVENTION NURSE MANAGER INTERVIEW QUESTION

Introduction:

We are attempting to gain a better understanding of the hospital environment relative to the initiation of breastfeeding. I am conducting this interview because several registered nurses from your hospital recently took an online course in breastfeeding best practices at Metro State and we are interested in hearing your perspective about how that may have affected patient care in relationship to breastfeeding.

I will ask you some questions about hospital policies and practices and other influences that affect breastfeeding initiation behaviors in your hospital. There are no right or wrong answers and we expect to hear differing points of view. We are looking for broad generalizations about potential changes in patient care.

1. In the past year has the environment at your hospital changed in relationship to what happens immediately after delivery?

Probes:

- Skin to skin until first breastfeeding? All infants are placed skin to skin after delivery until first breastfeeding.
 - Breastfeeding within 2 hours of delivery?
 - Self attachment?
 - Time frame for administering vit K and eye ointment.
2. Do you feel your current policies are in line with best practices for breastfeeding initiation? Has there been any discussion about updating your policies? Are there any policies that are currently being changed?
 3. In the past year has the environment at your hospital changed in relationship to what happens in Labor and Delivery to support breastfeeding initiation? Are there any labor and delivery or postpartum care policies that are being revised? See above
 4. In the past year has the environment at your hospital changed in relationship to what happens in postpartum care to support breastfeeding?
 5. Probes:
 - Supplementation with donor milk? Timeframe? Mom baby nurses are comfortable teaching hand expression.
 6. Are there any labor and delivery or postpartum care policies related to breastfeeding that are being revised?

7. What kind of breastfeeding education is provided for mother?

Probes:

- At admission? During labor? .
 - Immediately after birth? First 24 hours? 48 hours?
 - Who provides education?
 - What are they educated about? Latch? Pain? Feeding cues ? feeding frequency? Hand expression? Stimulation to stay awake? Different positions? Latch actually observed? Charted? Nipple condition observed? Charted? .
 - Do nurses assess pt for potential risk for breastfeeding difficulty? near-term gestation, short frenulum or difficult delivery. history of surgery, mastitis or poor/low milk supply.
8. When is lactation staff available? Who do your nurses go to with lactation questions if lactation staff is not available? How do the nurses perceive the lactation staff?
9. Any other comments or thoughts you would like to share?

Thank you for your time!

Rev 11/17/08

APPENDIX O

SUMMARY OF MANAGEMENT INTERVIEWS

Management teams (including charge nurses, labor and delivery/NICU unit managers, postpartum care unit managers, and directors) at three Colorado hospitals were interviewed about changes that had occurred related to breastfeeding initiation policies and best practices during the year prior to the interview. The hospitals were chosen because a group of nurses from each hospital had taken an online course in breastfeeding initiation best practices the year before. The interviews served to gauge the managers' perception of changes that had occurred during the year after the nurses took the course.

1. *In the past year has the environment at your hospital changed in relationship to what happens immediately after delivery?*

Summary: 2/3 hospitals have made changes in 2008/2009. Most healthy term vaginal deliveries are placed skin to skin and left there until first breastfeeding. Transition is now done on the abdomen. Most infants' breastfeed during the first hour of life. Weight is delayed until after first feeding and eye ointment and Vit K are delayed until the end of the first hour after birth and are given to the baby on the abdomen.

All of the hospitals agree they need more education about self attachment and the role it plays in breastfeeding success.

2&3. *Do you feel your current policies are in line with best practices for breastfeeding initiation? Has there been any discussion about updating your policies? Are there any policies that are currently being changed?*

2/3 currently have policies that have been updated to support breastfeeding best practices. The third hospital was given a model hospital policy by the corporate hospital administration and is working to convert this model policy into actual hospital policy and to implement the recommendations found in this policy.

Many policies have been updated during 2008/2009 including:
no latch policy

Required to observe and chart on at least one full feeding q shift

Hand expression

Pacifier use and parental education about pacifier use

Still need policies on:

Safe sleeping

Feeding cues

Consistency/scripted responses to FAQ

4. In the past year has the environment at your hospital changed in relationship to what happens in postpartum care to support breastfeeding?

In 2/3 hospitals breastfed infants will be offered HDM if supplementation is medically indicated. Given information fact sheet about HDM. Standing supplementation orders include HDM as first choice. There is an updated policy on storage. Use of HDM is documented in chart.

- a. Supplementation is appropriate for : hypoglycemia unresponsive to breastfeeding, maternal infant separation, clinical evidence of dehydration (parameters outlined in policy), >10% wt loss, hyper bili, latch score of <7 and/or evidence of lack of milk transfer at 10-12 hours of age. IN all cases, mothers hand expressed or pumped own milk or colostrums is first choice, then HDM, and formula is last choice.

No latch policy: 12 hours before supplementation at 2/3 hospitals and 3rd hospital is changing to 12 hour policy.

Pacifier policy: the policy states pacifiers will be used for circs and provided at parental request but RN must educate parents of breastfeeding infants about a pacifiers effect on successful breastfeeding. No pacifiers in armoires (bassinets).Pacifiers available in NICU/ICN as this is appropriate.

5. *What kind of breastfeeding education is provided for mother?*

All 3 hospitals had prenatal breastfeeding courses. At admission nurses ask “how do you plan to feed your baby” and if the parent/s haven’t decided, the nurse uses that as a teachable moment to discuss breastfeeding.

In 2/3 hospitals, the labor and delivery nurse prepared the patient for the infant to be placed skin to skin after delivery. They discussed that the patient’s gown will be undone at the shoulders in order to expose the breast and that infant will be quickly dried and stimulated after being caught and will be placed on the abdomen and left there until first feeding.

24-48 hours- all 3 hospitals have 30-60 minute “new mom breastfeeding’ classes on the unit .

One hospital discussed that they view the RN as the primary provider of breastfeeding support and that the LC is a resource for when the situation is difficult or they cannot find a resolution for the breastfeeding couplet’s problem/issue.

6. *When is lactation staff available? Who do your nurses go to with lactation questions if lactation staff is not available? How do the nurses perceive the lactation staff*

m-f 8-5

m-sat 8-5

m-sun 8-5

7. *Any other comments or thoughts you would like to share?*

Summary:

Many policies and procedures have changed over the last 12-18 months (interview conducted in early 2009) in 2/3 hospitals and the changes were driven by the nurses' desire for change towards evidence-based best practices. In addition, the establishment of breastfeeding policies allowed the environment of best practices to remain the "norm" even as nurses or nurse managers left and were replaced by other nurses.

The third facility was given model policy/best practices from the corporate level and while they planned to implement the practices and write policy to support these practices; they struggled with cuts to their lactation services budget and the issue of how to educate the nurses on how to implement these policies and practices with no additional support of budget available.

APPENDIX P

IRB APPROVAL

Colorado Multiple Institutional Review Board Mailing Address: (303)
724-1055 [Phone]
13001 E. 17th Place Mail Stop F-490 (303) 724-0990 [Fax]
Building 500, Room N3214 P.O. Box 6508 www.uchsc.edu/comirb [Web]
Aurora, Colorado 80010-7238 Aurora, Colorado 80045-6508
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FWA#: FWA00005070

University of Colorado Hospital
Denver Health Medical Center
Veteran's Administration Medical Center
The Children's Hospital
University of Colorado Health Sciences Center
Colorado Prevention Center

Jennifer Weddig
Mscd
P.o. Box 173362, Campus Box 33
DENVER CO, 802173362
02/22/2011

Certificate of Approval

Investigator:
Jennifer Weddig

Sponsor(s):
Colorado Physical Activity And Nutrition Program

Title:

Subject:
COMIRB Protocol 07-0887
Initial Review (APP001)

IMPROVING BREASTFEEDING INITITATION PRACTICES THROUGH ONLINE

2nd

THEORY BASED EDUCATION FOR BIRTHPLACE AND FAMILY CARE
NURSES - AUGUST 2007

Approval Date:
25 October 2007

Expiration Date:
24 October 2009

Expedited Category: 5, 7
Review Type/Panel: Expedited/Panel X
Approval Includes: Protocol - Investigator -2 Consent Form(s) -1
Advertisement(s)

All COMIRB Approved Investigators must comply with the following:

For the duration of your protocol, any change in the experimental design/consent and/or assent form must be approved by the COMIRB before implementation of the changes.

Use only a copy of the COMIRB signed and dated Consent and/or Assent Form. The investigator bears the responsibility for obtaining from all subjects "Informed Consent" as approved by the COMIRB. The COMIRB REQUIRES that the subject be given a copy of the consent and/or assent form. Consent and/or assent forms must include the name and telephone number of the investigator. Provide non-English speaking subjects with a certified translation of the approved Consent and/or Assent Form in the subject's first language.

The investigator also bears the responsibility for informing the COMIRB immediately of any Unanticipated Problems that are unexpected and related to the study in accordance with COMIRB Policy and Procedures.

Obtain COMIRB approval for all advertisements, questionnaires and surveys before use.

Federal regulations require a Continuing Review to renew approval of this project within a 12-month period from the last approval date unless otherwise indicated in the review cycle listed below. If you have a restricted/high risk protocol, specific details will be outlined in this letter. Non-compliance with Continuing Review will result in the termination of this study. This project has been

assigned the following review cycle:

COMIRB Continuing Review Cycle: 12 months

We will send you a Continuing Review Form to be completed prior to the due date. Any questions regarding this COMIRB action can be referred

to the Coordinator at 303-724-1055 or UCHSC Box F-490.

Ken Easterday, R.Ph. Hans Neville, M.D. Dave Lawellin, Ph.D. Steve Bartlett, R.Ph.

Warren Capell, M.D. Chris Duclos, Ph.D. Douglas Ford, M.D. Mary Geda, RN, MSN

Revised 03/05 DH 07-0887 Panel: X/B Expedited

Research Integrity & Compliance Review Office
Office of the Vice President for Research
321 General Services Building -Campus Delivery 2011
Fort Collins, CO
TEL: #(970) 491-1553
FAX: #(970) 491-2293

NOTICE OF APPROVAL FOR HUMAN RESEARCH

DATE: June 24, 2009
TO: Weddig, Jennifer, Baker, Susan , Food Sci. & Human Nutrition
Melby, Christopher , Food Sci. & Human Nutrition, Swiss, Evelyn ,
RICRO, Gutilla, Molly , RICRO
FROM: Janell Barker, CSU IRB 1
PROTOCOL TITLE:
Improving Breastfeeding Initiation Practices through Online Theory
Based Education for Maternity Nurses
FUNDING SOURCE:
Colorado Physical Activity and Nutrition grant \$3000 through Metro
State College where the
course/intervention is taking place
PROTOCOL NUMBER: 09-1127H
APPROVAL PERIOD: Approval Date: October 02, 2008 Expiration Date:
October 01, 2009

The CSU Institutional Review Board (IRB) for the protection of human
subjects has reviewed the protocol entitled: Improving Breastfeeding
Initiation
Practices through Online Theory Based Education for Maternity
Nurses. The project has been approved for the procedures and
subjects
described in the protocol. This protocol must be reviewed for
renewal on a yearly basis for as long as the research remains
active. Should the protocol
not be renewed before expiration, all activities must cease until
the protocol has been re-reviewed.

If approval did not accompany a proposal when it was submitted to a
sponsor, it is the PI's responsibility to provide the sponsor with
the approval notice.

This approval is issued under Colorado State University's Federal
Wide Assurance 00000647 with the Office for Human Research
Protections (OHRP). If
you have any questions regarding your obligations under CSU's
Assurance, please do not hesitate to contact us.

Please direct any questions about the IRB's actions on this project
to:

Janell Barker, Senior IRB Coordinator -(970) 491-1655
Janell.Barker@Research.Colostate.edu
Evelyn Swiss, IRB Coordinator -(970) 491-1381
Evelyn.Swiss@Research.Colostate.edu

Janell Barker

Includes: Approval for the remaining 134 participants. The above-referenced project was approved by the Institutional

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