BREASTFEEDING KNOWLEDGE AMONG LOW-INCOME FIRST-TIME PREGNANT WOMEN

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Felicia F. Dreesmann
Spring 2014
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ABSTRACT

BREASTFEEDING KNOWLEDGE AMONG LOW-INCOME FIRST-TIME PREGNANT WOMEN

by

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Master of Science in Nursing

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Disparities in breastfeeding initiation rates and breastfeeding duration have been found among mothers of low-income status. The breastfeeding education a pregnant women receives is positively correlated with breastfeeding outcomes however, there is little known about the comprehensive breastfeeding knowledge of first-time low-income pregnant women. The objective of this study was to expand on the information on first-time low-income pregnant women concerning their comprehensive breastfeeding knowledge.

A quantitative descriptive research design was used to investigate breastfeeding knowledge levels. Thirty first-time low-income pregnant women were invited to participate in the study. A breastfeeding knowledge questionnaire (BKQ) was designed to measure the participants’ knowledge on seven breastfeeding knowledge domains. The lowest mean score (0.97 +/-0.669) was found in the area that tested
participants’ knowledge on breastfeeding problem-solving. The second-lowest group mean score (1.133+/- 0.819) was found on the topic of time and frequency of breastfeeding. The third- and fourth-lowest mean scores were on the topics of breastfeeding benefits for the infant (1.333+/- 0.711) and breastfeeding benefits for the mother (1.167+/- 0.791), respectively. Results revealed that a participant’s age was a significant variable that affected scores on the topic of breast milk components (p = 0.05). The total group mean score (N=30) was 64.48%. These findings indicate low-income first-time pregnant women would benefit from breastfeeding education that emphasizes the benefits of breastfeeding, time and frequency of feedings, and breastfeeding problem-solving. Information gained from this study can be used by healthcare educators to develop comprehensive breastfeeding educational programs that are tailored to the needs of low-income first-time pregnant women to help increase breastfeeding initiation rates and breastfeeding duration time.
CHAPTER I

INTRODUCTION

The Healthy People 2020 breastfeeding objectives were created to increase breastfeeding initiation rates and duration in the United States (Centers for Disease Control and Prevention [CDC], 2013). Though breastfeeding benefits reported in research are compelling, disparities in breastfeeding initiation rates and duration have been found among women of low-income status (Michigan State University, 2012; Thulier & Mercer, 2009). The breastfeeding education that pregnant women receive can impact their infant feeding choice. Although it is important for mothers to know about the various aspects of breastfeeding to make an informed infant feeding choice, there is little known about what first time, low-income pregnant women know about breastfeeding.

Breastfeeding is widely recognized as the means of providing infants with the best source of nutrition during the first six months of life (Eidelman & Schanler, 2012; Ip, Chung, Raman, Trikalinos, & Lau, 2009; U.S. Department of Human Health Services [USDHHS], National Institute of Child Health & Human Development [NICHD], 2012). There is strong evidence cited in literature that breastfeeding has positive short and long term health benefits for both mother and baby (Ip et al., 2009; USDHHS, NICHD 2012). Reduced risks of severe lower respiratory tract infections, sudden infant death syndrome, acute otitis media, asthma, childhood leukemia, atopic dermatitis, type 1 and 2 diabetes, gastroenteritis, and obesity in children have been linked to breastfeeding (Ip et al., 2009).
Women who have breastfed have a decreased risk of postpartum depression, breast and ovarian cancers, and type 2 diabetes (Ip et al., 2009).

It has been found that exclusive breastfeeding (feeding human milk only) for at least six months reduced the probability of urinary tract infections in female infants (Levy et al., 2009). Furthermore, NICHD-supported research suggests breast milk has important fatty acids that help infants’ brain development and may increase infants’ cognitive skills (USDHHS, NICHD, 2012). Additionally, research has shown there was a significant association between infants who were breastfed and higher intelligence test scores (Holme, MacArthur, & Lancashire, 2010).

Although many studies have focused on the physiologic and immunologic advantages of breastfeeding, research also has shown that breastfeeding has a positive effect on early maternal infant bonding (Else-Quest, Hyde, & Clark, 2003). Mothers often report that breastfeeding has been a positive emotional experience they shared with their infant. In a large longitudinal study, quality of the mother-infant-relationships was measured at 4 and 12 months. Results revealed that breastfeeding mothers at 4 months after birth were more likely to feel a greater connection to their infants than those who bottle-fed their infants (Else-Quest et al., 2003).

Over the past decade, multiple disasters have prompted an emphasis on emergency preparedness in America. Young infants are among the most helpless in disaster situations, but a breastfeeding mother can provide her baby with food, water, protection, and care. Thus, every mother who initiates breastfeeding is contributing to emergency preparedness. Breastfeeding is supported in emergency situations for multiple reasons, as breast milk is free, available in unlimited supply, sanitary, full of antibodies
that help fight infection and disease, always fresh and warm from the mother, and helps calm the baby, even in the midst of stressful situations (United Nations Children’s Fund [UNICEF], 2009).

Breastfeeding offers strong protection against the effects of poverty and is a key strategy in reducing disparities between the rich and poor. Bartick and Reinhold’s (2010) data revealed that breastfeeding had economic benefits. Additionally, this study found that breastfeeding significantly decreased health care costs and saved lives. Researchers projected what the cost savings would be if 90% of U.S. families followed the recommendation to exclusively breastfeed for 6 months. The compelling results showed that the United States would save $13 billion a year and prevent over 911 infant deaths (Bartick & Reinhold, 2010).

Background

The Healthy People 2020 breastfeeding objectives are to increase the percentage of infants who are breastfed (CDC, 2013). Specific objectives include increasing the percentages of infants who are ever breastfed to 81.9%, of those who are breastfed up to age 6 months to 60.6%, and of those who are breastfed up to 1 year to 34.1% (CDC, 2013). The objectives also call for increasing the percentage of babies who are exclusively breastfed for 3 months to 38% and for 6 months to 25.5%. Exclusive breastfeeding is defined as only breast milk—no solids, no water, and no other liquids (CDC, 2013). According to the CDC (2013), NIS based on 2009 data, the Healthy People 2020 breastfeeding objectives have not been met. The CDC NIS 2009 data show that the percentage of infants who were ever breastfed was 76.5%, while the percentages of those
ever breastfed up to 6 months and 1 year were 47.8% and 25.7%, respectively. The percentages of those exclusively breastfed through 3 months and 6 months were 36% and 16.3%, respectively (CDC, 2013).

Improving the breastfeeding rates is an important goal of the Centers for Disease Control and Prevention (CDC, 2013). Because current data show that the Healthy People 2020 breastfeeding rates have not been met, investigating what mothers know about breastfeeding may help healthcare educators develop breastfeeding programs that promote and support breastfeeding.

Statement of the Problem

Breastfeeding benefits are well-documented (Ip et al., 2009); however, disparities in breastfeeding initiation rates and breastfeeding duration have been found among mothers of low-income status and lower educational backgrounds (Thulier & Mercer, 2009). Literature regarding low breastfeeding rates has indicated that maternal education and socioeconomic factors play a role in breastfeeding initiation among low-income mothers (Thulier & Mercer, 2009). Thulier and Mercer (2009) found that the demographic variables that influence breastfeeding rates included race, maternal age, marital status, level of education, and socioeconomic status.

According to a Surgeon General’s U.S. Department of Health and Human Services (2011) public health report, many new mothers in the United States are faced with the decision of whether to breastfeed or bottle-feed. The decision-making process for low-income mothers can be difficult because of the multiple influences that can affect their choice. It is imperative that mothers receive support and education on breastfeeding
benefits to make an informed decision. The breastfeeding education that a mother receives can be an influencing factor that affects her infant feeding intention (USDHHS, 2011). To provide breastfeeding support and education that is tailored to the needs of low-income first-time pregnant women, it is crucial to explore what low-income first-time women know about breastfeeding.

Relevance to Nursing

Nurses are often in a position to plan interventions that help promote breastfeeding. There are many settings where nurses encounter women who are in the process of making infant feeding decisions. Professional breastfeeding support can have a great effect on breastfeeding success. Nurses can play a vital role in providing mothers with educational support to address modifiable factors that affect breastfeeding outcomes. Yen-Ju and McGrath, (2011) found that a lack of breast milk supply was the most common reason that women stopped breastfeeding prior to the end of the six week postpartum period. This information shows an area where health care providers can improve breastfeeding outcomes through breastfeeding education to reduce the incidence of low breast milk supply (Yen-Ju & McGrath, 2011). This study supports the importance of effective breastfeeding intervention from nurses who come in contact with mothers who are deciding between breastfeeding and bottle-feeding.

Breastfeeding promotion is a way in which nurses affect morbidity and quality of life (Frick, Milligan, White, Serwint, & Pugh, 2012). There should be a heightened level of concern when low breastfeeding initiation rates are identified among mothers in disadvantaged populations. Healthcare providers charged with serving low-income
pregnant women can assist in providing breastfeeding education that provides women with information to make an informed infant feeding choice.

Nurses are challenged with meeting the breastfeeding educational needs of new mothers during the short time that mothers are hospitalized after giving birth. Increasing breastfeeding initiation and duration rates among low-income mothers is an even greater challenge for healthcare educators. With the disparities seen in breastfeeding rates within economically disadvantaged mothers, it is important that breastfeeding education targets mothers in this population.

Barriers that prevent low-income mothers from receiving adequate breastfeeding support and education are important to explore. Special Supplemental Nutrition Program for Women, Infant, and Children (WIC) participating mothers represent a low-income population in which low breastfeeding initiation rates have been identified (Ziol-Guest & Hernandez, 2010). Mothers can benefit from breastfeeding support and information from nurses who take into account the unique needs of the different populations they serve.

Theoretical Framework

Key concepts from Mercer’s (2004) Becoming a Mother (BAM) Theoretical Model are relevant to this study and have been selected to guide this research. BAM theoretical framework is applicable for this study, as knowledge that a mother acquires closely parallels the components and stages described in Mercer’s BAM Theoretical Model (Mercer, 2004).
Pregnancy marks a time of transition when a woman moves into a new role as a mother (Mercer, 1995). Reva Rubin (as cited in Mercer, 2004), a professor at the University of Pittsburgh who is well known for her works in the area of obstetrics, defined maternal role attainment as an end point in the maternal role, with a woman seeing herself in the role and having a sense of comfort about it. Rubin’s (as cited in Mercer, 2004) concepts of maternal role attainment (MRA) focused on the period in a woman’s life from pregnancy to one month after birth. Mercer, a student of Rubin, was involved in several studies on MRA that she later expanded on to include the first year following birth. After extensive research on MRA, Mercer later retired the MRA term in favor of a new term, “becoming a mother,” to expand the meaning of motherhood to encompass the initial transformation and continued growth of the mother identity (Mercer, 2004).

Mercer (2006) explained that a woman begins maternal identity when she transitions to motherhood through her commitment and connection in defining her new identity. Maternal identity develops as a mother learns new skills to gain confidence in herself as new challenges arise (Mercer, 2006). The theorist described three main components of the mothering role that include attachment to the infant, gaining competence of the mothering role, and expressing gratification in the maternal interactions (Mercer, 1995). In addition, Mercer described three phases related to maternal role attainment in which pregnancy marks an experience which changes the women’s status quo, requires the women to move from one reality to another, and requires a new role identity. Furthermore, Mercer (2004) argued that a mother must acknowledge the essential change, seek out information and role models, and test herself-competence.
Mercer (1995) described four stages in becoming a mother. The first stage commences during pregnancy and occurs when women seek information from others in the role and explore expectations. This stage includes social, psychological, and physical adjustments to pregnancy. In the second stage, the woman learns from others, models their behavior, and, with practice, gains skill. This stage begins with the birth of the infant, which includes recovery time. The third stage was described by Mercer (1995) as “settling in” in this phase, the woman learns infant cues and develops her own style of mothering. The last stage is when the woman incorporates the new maternal role into her self-system and sees herself as a competent mother (Mercer, 1995). This study was focused on Mercer’s (2006) first stage of becoming a mother which is a stage that occurs prior to the birth during pregnancy as illustrated in Figure 1.

Figure 1. First stage of becoming a mother.

Mercer and Walker (2006) presented a model that illustrated the interacting environmental factors that affect the process of becoming a mother. The BAM theoretical model illustrates interactions of the mother, infant, and father at the center with the living environments of *Family and Friends, Community, and Society at Large* surrounding them. Mercer and Walker (2006) included in the BAM model five environmental factors that have the potential to positively or negatively affect the process of becoming a mother, which include *Social Role Preparation, Mother-Infant Attachment Promotion, Mother-Infant Interaction Focused Education, Infant Caregiving Instruction,* and *Therapeutic Relationships*. These environmental variables that can affect the process of becoming a mother are important factors to consider when developing breastfeeding educational interventions (Mercer & Walker, 2006).

As a mother enters the first stage of BAM, as described by Mercer, expectations of the maternal role are explored; it is in this stage that a mother will make a decision on infant feeding choice. According to Mercer (1995), maternal behavior is learned in this early stage. The study reported here is focused on this stage of becoming a mother for the purpose of gaining more information on what first-time women of low income currently know and have learned about breastfeeding.

In this study, the researcher used Mercer’s (2004) BAM theory as a guide to select a sample population of pregnant women who were in the first stage of becoming a mother. During this stage, pregnant women acknowledge the essential change, seek out information and role models, and test their competency. In addition, Mercer’s theoretical framework shaped the content of a questionnaire that measured first time, low-income pregnant mothers’ comprehensive breastfeeding knowledge.
Purpose and Research Question

The purpose of this study was to add knowledge in the literature related to first-time low-income pregnant women’s breastfeeding knowledge. The specific aim of this study was to describe low-income women’s breastfeeding knowledge and to identify areas where breastfeeding knowledge is strong or weak. The information gained from this study can then be applied to improve nursing care and to guide future research. The following question guided this study: *What is the breastfeeding knowledge of low-income first-time women during pregnancy?*

Definition of Terms

**Breastfeeding**

“The child has received breast milk direct from the breast or expressed” (World Health Organization [WHO], 2008, p.1).

**Breastfeeding Knowledge**

“The extent of understanding conveyed about lactation and nourishment of an infant through breastfeeding” (Knowledge: Breastfeeding, 2009, p.1).

**Knowledge**

“The fact or condition of knowing something with familiarity gained through experience or association” (Knowledge, 2010, p.1)

**Low-income**

To be eligible on the basis of income, WIC applicants’ gross income (before taxes are withheld) must fall at or below 185 percent of the U.S. Poverty Income Guidelines (U.S. Department of Agriculture, Food and Nutrition Service, 2012).
Qualifications of the Researcher

The researcher’s background includes a Bachelor of Science degree in Nursing, National Board for Case Management Certification, and State Board of Public Health Certification. This researcher has 28 years of nursing experience that includes nursing practice in an acute care pediatric unit, pediatric oncology unit, neonatal intensive care unit, post-partum unit, mental health unit, orthopedic care unit, and emergency department. In addition, the researcher has gained experience and knowledge through a public health clinical practicum rotation at a breastfeeding support center where she worked alongside several professional lactation consultants. Furthermore, in 2009 the researcher spearheaded a *Mothers Supporting Mothers Breastfeeding Promotion Project* aimed to expose young and low income expectant mothers to a source of breastfeeding support from their peers. Twenty five breastfeeding mothers from Shasta County Breastfeeding Support Center were asked to submit their breastfeeding stories to share with new expectant mothers. The stories were displayed at various locations in the North state in celebration of the 2009 World Breastfeeding Awareness Week. The 2009 World Breastfeeding Awareness Week theme was focused on emergency preparedness. In keeping with this theme the researcher included educational data on why breastfed babies are better prepared for emergency situations. Because the World Breastfeeding celebration week presented opportunities to provide peer support to new mothers, the researcher compiled stories from breastfeeding mothers to display in the exhibits.
Transitional Statements

Pregnancy marks a time of transition when a woman begins to learn about becoming a mother (Mercer, 1995). According to Mercer, it is during pregnancy that women seek out information on their role as a mother from others. As pregnant women transition into their role as a mother they will need to make an important decision on their infant feeding choice. The breastfeeding knowledge a mother receives can positively or negatively affect her decisions to initiate breastfeeding and to continue breastfeeding. Although positive breastfeeding health benefits reported in the research literature are compelling, breastfeeding initiation rates and duration have been found among women of low-income status (Thulier & Mercer, 2009; Michigan State University, 2012). There are various factors that can affect breastfeeding initiation rates and duration, including breastfeeding knowledge. The following chapter will discuss the literature relevant to this research study to demonstrate the current state of knowledge to this topic.
CHAPTER II

LITERATURE REVIEW

Introduction

Lower breastfeeding initiation rates and shorter breastfeeding duration have been found among mothers of low-income status (Thulier & Mercer, 2009). There are a variety of reasons mothers decide not to initiate breastfeeding or discontinue breastfeeding early (Thurman & Allen 2008). Factors such as breastfeeding knowledge can have a positive impact on breastfeeding initiation and duration (Laanterä, Pietilä, & Pölkki, 2010). A new section of the California Senate Bill-502, Hospital Infant Feeding Act, went into effect in January 2014. The Senate Bill requires hospitals that are providing maternity care to have an infant feeding policy in place that promotes breastfeeding (California Senate Bill-502, 2011). When developing breastfeeding education and promotion programs it is important to have a baseline understanding of what pregnant women know prior to receiving formal breastfeeding education. The purpose of this chapter was to add to the knowledge related to low-income first-time pregnant women’s breastfeeding knowledge and to identify areas where breastfeeding knowledge deficits exist.

A literature review was conducted to examine a body of literature that was relevant to the research question: What is the breastfeeding knowledge of low-income first-time women during pregnancy? Prior to selecting research articles, the researcher
reviewed the definition of *knowledge* to ensure the literature review captured information on the correct meaning and how breastfeeding knowledge is gained.

A literature search was performed using the following databases: CINAHL, PubMed, ERIC, and Google. The following search terms were used to conduct literature review: *breastfeeding and benefits, breastfeeding knowledge, breastfeeding and influences, breastfeeding and experiences, breastfeeding and education, breastfeeding and support, breastfeeding and education, and breastfeeding and disparities*. This literature review is organized in the following thematic areas (a) breastfeeding experiences; (b) influences on the decision to breastfeed; and (c) breastfeeding knowledge.

**Breastfeeding Experiences**

A qualitative descriptive study by Wambach and Cohen (2009) studied the breastfeeding experiences of English-speaking urban adolescent single mothers 14 to 18 years of age. Mothers who were presently breastfeeding or who had breastfed in the past six months were asked to participate in a study in obstetric clinics at urban university medical centers. Thirty-two mothers volunteered to participate, and 23 subjects completed the study; all but one participant were first-time mothers (Wambach & Cohen, 2009). Of the 11 participants who knew their family income, annual income levels ranged from low to middle ($15,000 to $45,000) (Wambach & Cohen, 2009).

Initially data were collected on the participant’s breastfeeding experiences from scheduled focused groups; however, due to low attendance, some individual semi-structured interviews were completed in the participants’ homes. Verbatim audiotape
transcripts and footnotes were utilized to analyze qualitative content. Trustworthiness of data collection was established through steps that included (a) pilot testing questions for clarify; (b) careful observations for response ambiguities; (c) conduction of member checks; and (d) search of rival explanations found during analysis through reexamination and discussion until agreement is reached on competing themes (Wambach & Cohen, 2009).

Prenatal results from this study revealed the main reason mothers breastfed was for the health of the infant. For example, 16 of the 23 mothers reported infant breastfeeding benefits such as decreased infant illness and childhood obesity. The second reported reason mothers breastfed was for the easiness of infant feedings. Motherliness and naturalness were cited least often as reasons for breastfeeding initiation. Maternal health and economic benefits associated with breastfeeding were less often reported by mothers as reasons to breastfeed (Wambach & Cohen, 2009).

The Wambach and Cohen (2009) study also explored postnatal teen breastfeeding experiences. A majority of mothers reported experiencing problems, primarily in learning the mechanics of breastfeeding. Findings revealed major reasons reported for early weaning were focused on perceived low milk supply, difficulty in getting infants to latch, sore nipples, and a busy schedule because the mothers had to return to school or work (Wambach & Cohen, 2009). Mothers reported that positive support for breastfeeding came from nurses, partners, family, and friends through hands-on support and information on breastfeeding complications. In addition, the study revealed that some mothers reported negative experiences regarding nursing support,
such as, teen moms feeling disregarded, receiving inconsistent information, and feeding infants bottles of formula (Wambach & Cohen, 2009).

Although the Wambach and Cohen (2009) study on urban adolescent mothers provided valuable information regarding breastfeeding experiences, the results are limited because the data collected came from mothers who had already made the decision to breastfeed. Furthermore, the demographic information collected on socioeconomic status has limited use because less than half of the participants knew their family income. Therefore, findings from this study cannot be generalized to all teenage mothers from different socioeconomic statuses. Although limitations in the study were identified, the study did reveal an opportunity for future research. This study revealed information related to breastfeeding mechanics and problem solving that could lead to early breastfeeding cessation. While a mother’s knowledge of breastfeeding benefits may be a factor that contributes to her infant feeding choice, a mother’s knowledge regarding breastfeeding mechanics and problem solving might contribute to an informed choice to continue breastfeeding. Future research would be needed to describe what mothers know prior to the birth of their infants regarding not only breastfeeding benefits but also breastfeeding mechanics and problem solving (Wambach & Cohen, 2009).

Kaunonen, Hannula, and Tarkka (2012) conducted a systematic review to describe how effective peer support interventions are in supporting breastfeeding during pregnancy, hospitalization, and the postnatal period. These interventions were evaluated from various perspectives including breastfeeding initiation, continuation, exclusive breastfeeding and mothers’ confidence in their breastfeeding experience. This systemic review included an analysis of 30 studies and four literature reviews. These researchers
defined a peer supporter as a person, other than a healthcare professional, who supports breastfeeding, for example, a partner, relative, or friend. Although some peer supporters from the various studies had received formal breastfeeding support training, the researchers’ definition of a peer supporter did not include the requirement of peer support training. The results of this systematic review concluded that different types of breastfeeding support interventions are needed throughout the prenatal, hospitalization, and postnatal phases to produce effective results. Although the conclusions revealed that peer support was strongly associated with the postnatal phase, it was a combination of professional and peer support from trained and experienced peer supporters that increased breastfeeding duration (Kaunonen et al., 2012). Thirteen research studies analyzed by these researchers revealed a positive correlation between peer support and breastfeeding continuation. One study found mothers were 15 times more likely to breastfeed exclusively during their three month follow-up if they received peer support. Furthermore, a positive correlation was found between peer support and breastfeeding satisfaction in nine research articles (Kaunonen et al., 2013).

Influences on the Decision to Breastfeed

Maternal personality and attitudes have been found to affect mothers’ breastfeeding decisions. Brown (2014) conducted an exploratory cross-sectional survey to examine associations among breastfeeding duration, maternal personality and attitudes, and experiences of breastfeeding. The study recruited 602 mothers with infants 6 to 12 months of age to participate in the study and asked them to complete a self-report questionnaire (Brown). A Ten Item Personality Measure (TIPM) tool contained five
scales to measure five personality traits: openness, extraversion, agreeableness, conscientiousness, and emotional stability. A Cronbach’s alpha for internal consistency was high for all five scales. Qualitative interviews were conducted to examine influences on maternal attitudes, breastfeeding experiences, and mother’s infant feeding choice (Brown, 2014). Results indicated the maternal traits of extraversion, emotional stability, and conscientiousness were significantly associated with increased breastfeeding initiation rates and longer continuation (Brown, 2014). Additional results found that extraversion was significantly inversely associated with a mother’s belief that breastfeeding is difficult ($p = 0.04$). Conscientiousness was significantly positively associated with the belief that breastfeeding is healthier than bottle-feeding ($p < 0.001$) and was inversely associated with the belief that breastfeeding is inconvenient ($p = 0.008$). Qualitative interviews found that mothers who had introverted and anxious personality types were more likely to report feeling pressured by others to stop breastfeeding. Women with introverted personality types may find it difficult to challenge others negative attitudes and those with anxious personality traits may find seeking out support systems to be challenging. These findings indicate that maternal traits may have an influence on breastfeeding initiation rates and continuation. Identifying maternal personalities that are associated with attitudes and beliefs that can negatively influence breastfeeding decisions can help healthcare professionals to target their educational and support interventions (Brown, 2014).

In a study conducted by Swanson and Power (2005), researchers examined changes in the influence of subjective norms on infant feeding methods from birth to the six-week follow-up for breastfeeders and bottle-feeders, with an emphasis on mothers
who discontinued breastfeeding during this time period. The study explored what influences the opinions of the mother’s mate, mother, midwife, and nurse had at both birth and follow-up at six weeks after birth on the mother’s choice in feeding methods. Researchers administered a semi-structured questionnaire to 203 first-time mothers in Scotland, which was followed by a questionnaire at six weeks after the infants’ birth. In addition, mothers’ infant feeding interventions and behavior, and behavioral belief and subjective norms for both breastfeeding and bottle-feeding were analyzed at birth and at six weeks after infants’ birth (Swanson & Power, 2005).

The Swanson and Power (2005) questionnaire encompassed questions on demographics that included age, education level, marital status, and housing type. Partner’s and women’s employment status placed women according to socio-economic status on a scale (1= high; 6= low). The questionnaire included mother’s past behavior, feeding intention, and feeding behavior at baseline. The researchers defined baseline as the time in the hospital after birth of the infant. Past behavior questions asked if mothers had previous children and if those children were breastfed or bottle-fed. Feeding questions asked of mothers, prior to birth, to report how they planned to feed their baby (breast, bottle, or combined). The feeding behavior at baseline question asked mothers how they were feeding their baby in the hospital, and they were asked to classify their feeding choice as breastfeeding infant (only breast milk), combined feeding (breast milk and formula milk), or bottle-feeding (only formula milk). Researchers measured mothers’ subjective norms by documenting their level of agreement or disagreement with five referents’ infant-feeding views. Referents were the partner, women’s own mother, closest female friend, midwives/nurses, and people in general. There were five statements on
breastfeeding and five for bottle-feeding; for example, “My own mother thinks I …” in which the end scale was labeled “definitely should breastfeed,” and “definitely should not breastfeed.” Evaluations of the importance of breastfeeding and bottle-feeding were measured on the 7-point Likert scale (Swanson & Power, 2005).

Results revealed that of the 203 mothers interviewed at birth, 60% were breastfeeding, 38% bottle-feeding, and 2% combined methods of feeding (Swanson & Power, 2005). Mothers who continued to breastfeed more often reported their partners as pro-breastfeeding than did mothers who combined breastfeeding and bottle-feedings or discontinued breastfeeding (Swanson & Power, 2005). When compared to breast feeders, bottle-feeders significantly were younger ($p < 0.001$), more likely to be single ($p < 0.01$), had less full-time education, were of lower socioeconomic status ($p < 0.01$), and were more likely to live in rented accommodations ($p < 0.01$). Although results did not find substantial differences in norms at birth, significant differences were revealed at follow-up (Swanson & Power, 2005). The importance of these finding is the identification of factors that can negatively affect breastfeeding initiation and duration for mothers.

The Swanson and Power (2005) study identified new information that could be used in future research. For example, this study found that women who stopped breastfeeding more often reported their partner, mother, friends, and nurses as more in favor of bottle-feeding. Furthermore, this study found that of women who discontinued breastfeeding, social normative pressure differed at birth and six weeks after birth such that a woman’s own mother was less supportive of breastfeeding at six weeks than at the baby’s birth. Additionally, this study found that the opinions of nurses and midwives were considered very important by breastfeeders. This information reinforces the
important role that nurses play in breastfeeding education and supports the need for a broad social approach to provide breastfeeding education that includes other individuals within mothers’ social network.

Although the results of the Swanson and Power (2005) study provided useful information regarding the influence of norms and social referents on women’s infant-feeding decision, the results did not state what breastfeeding information social referents provided women. Further research is needed to gain knowledge on what breastfeeding information low-income mothers have learned from their social referents and if the breastfeeding information they received was current, accurate information. Literature has revealed findings regarding the benefits of breastfeeding (Ip et al. 2009). Unfortunately, there is little known about what new mothers and their most-cited referents know about breastfeeding information. Although this study did provide useful information on what influences a mother’s choice to breastfeed, it is also important to understand what factors distract a mother from continuing to breastfeed once she starts.

Breastfeeding Knowledge

Disincentives to breastfeeding could be related to mothers’ lack of breastfeeding knowledge. In the Racine, Frick, Guthrie and Strobino (2009) study, researchers aimed to determine disincentives to breastfeeding measured at baseline (the time in hospital after birth of infant) and at 2-4 months as related to breastfeeding duration throughout the first year of life among low-income mothers. The theory of individual net benefit maximization was the conceptual framework selected for this research. This theory hypothesized that, “individuals choose to initiate behaviors that
bring them some type of benefit and choose to continue the behavior as long as the benefits of doing so outweigh the cost of continuation” (Racine et al., 2009, p. 242).

Researchers in this study used data from the Healthy Steps National Evaluation (HSNE). The HSNE samples were from 24 pediatric locations within the United States and included 2,359 low-income mothers, of which 1,595 initiated breastfeeding. The Individual Net-Benefit Model for Breastfeeding Duration (INBM), based on the theory of individual net benefit maximization, was designed by the researchers and used to analyze seven disincentive domains (Racine et al., 2009, p. 243). The seven disincentive domains included time, information, work/school, “Do No Harm,” finances, lack of social and professional support, and stress (Racine et al., 2009, pp. 242, 245). Researchers collected data at baseline and at 2-4, 6, 12, and 36 months (Racine et al., 2009).

Within the work and school disincentive domains, results showed that mothers who returned to work at 2-4 months had a dose-effect. The more a mother of low-income worked, the greater the risk of breastfeeding cessation. Mothers who worked 20 hours per week or less had 29% greater risk for breastfeeding cessation; those who worked 21 to 40 hours a week were at a 47% risk, and those who worked more than 40 hours per week were at a 52% risk. Findings revealed that mothers who had a high school degree or higher were at a reduced risk of discontinuing breastfeeding during the first year after giving birth. In addition, the study revealed four social and professional support factors that were significantly associated with a higher risk of breastfeeding cessation during the infants’ first year: a father not in the home, physicians who did not encourage breastfeeding, mothers who were a Women, Infants, and Children (WIC) participant at 2-4 months, and mothers who did not receive breastfeeding instruction at pediatric offices.
These identified factors reinforce the importance of assessing a mother’s breastfeed knowledge, as some mothers might not have been exposed to education that reflects accurate breastfeeding information (Racine et al., 2009). It is important to assess mother’s breastfeeding knowledge so breastfeeding disincentives could be address.

Young people appear to form early ideas about the infant feeding methods they might choose when they become parents (Swanson, Power, Kaur, Carter, & Shepherd, 2006). It is possible that infant feeding choices are made not only before women become pregnant but also before they become adults (Earle, 2000). This can present a problem if young women do not have access to accurate information on which to base their beliefs on breastfeeding. Although controversial, it has been suggested that infant feeding education in primary schools might help instill positive breastfeeding attitudes in children that could help influence their choices in adulthood (Angell, Alexander, & Hunt, 2010). Although there is little research on breastfeeding interventions conducted in a primary school setting, the literature has shown a positive correlation between classroom activities about infant-feeding and adolescents’ knowledge of, and intentions toward, breastfeeding.

Walsh, Mosely, and Jackson (2008) studied the effect of infant-feeding classroom activities on the breastfeeding knowledge and intentions of adolescents living in Nova Scotia, Canada. One hundred twenty-one students were invited to participate in a study to complete one pre-test and two post-tests to determine breastfeeding knowledge of adolescents. At first contact, all students were given a pre-test to complete. Following the pre-test, the students in the intervention group were given a 60-minute classroom activity on infant feeding by a nurse educator, after which students were asked to
complete the same questionnaire a second time. The control groups went to their regular scheduled class and were asked to complete the same questionnaire a second time. The results showed a significant increase in the intervention group’s knowledge that was reflected in both post-test scores immediately after the classroom intervention ($p < .001$) and at a 10-week post intervention test ($p < .001$). The intervention group also showed a significantly higher intention to choose breastfeeding or higher desire to breastfeed their future children at both post intervention ($p < .05$) and at the 10-week follow-up ($p < .05$) (Walsh et al., 2008).

Although the Walsh et al. (2008) study provided valuable information regarding the association between breastfeeding knowledge and intentions toward breastfeeding in adolescents, the infant-feeding classroom activity did not present information on breastfeeding mechanics. In addition, the authors did not specify whether the questionnaire contained information to determine students’ knowledge about breastfeeding mechanics and problem solving. Authors of the study stated that the breastfeeding presentation included information on the benefits of human milk for infants, the loss of breastfeeding culture and knowledge, the marketing of infant formula, and profits made by formula companies. Walsh et al. (2008) did state that a pilot test of the questionnaire was conducted, and the questionnaire contained 18 true/false questions to determine the adolescents’ knowledge of breastfeeding.

Laanterä et al.’s (2010) study was conducted to examine breastfeeding knowledge among fathers and pregnant mothers, discover variables related to breastfeeding knowledge, and to evaluate the use of a web-based survey. An electronic Breastfeeding Knowledge, Attitude and Confidence scale (BKACs) was developed by the
authors as a measurement tool to assess breastfeeding knowledge. A content validity index was calculated on the BKACs by five breastfeeding counseling professionals and was found to have highly relevant content. The Cronbach’s alpha values supported the reliability and validity of the dimensions of the BKACs. The breastfeeding section of the BKACs contained 24 statements in which a 4-point Likert scale and two open-ended questions were used. The two open-ended questions addressed knowledge on breastfeeding benefits and ways to increase lactation. The 4-point Likert items in the BKACs were related to breastfeeding management, lactation, breastfeeding in the hospital and at home, and specific situations such as breastfeeding problems. Data from the study were collected from eight maternity clinics in Finland. Between March 2 and April 3, 2009, all families who visited the clinic were invited to participate in the study, which resulted in 123 pregnant mothers and 49 fathers who completed the BKACs. All participants in the study were given the option to complete the BKACs through an electronic or paper format. The breastfeeding knowledge scores were categorized into five groups from (A-E) according to points scored (Laanterä et al., 2010).

In addition to the breastfeeding knowledge scores, demographic information was collected on the participants’ age, sex, income, number of children, highest education level, intention to breastfeed, and if participant lived with or without a partner. Data on the demographic information revealed that the participants in the study were 18 to 50 years old and the mean age was 30.31 years of age. Of the 172 participants, 123 were females, 49 were males; 91 participants had no additional children, and 81 participants had one or more additional children. Most of the participants (75%) were from the middle-to- high income class, and 25% were from the lower-income class. Most of the
participants (85%) had vocational qualifications, vocational diplomas, or academic degrees, and only 15% had completed comprehensive school or enrollment as their highest level of education. Nearly all the participants (98%) had intentions to breastfeed (Laanterä et al., 2010).

Results of the Laanterä et al. (2010), study revealed that 24% of the participants received excellent breastfeeding knowledge scores (10-22 points, classified as an A), 38% scored B (14-18 points), 29% scored C (10-13 points), 8% scored D (5-9 point), and 1% scored E (1-4 points). Researchers found information regarding participants’ demographic variables were associated with breastfeeding knowledge. Results from the breastfeeding knowledge survey revealed gaps in knowledge regarding information on feeding infants on demand, increasing lactation, and initiating complementary feedings (Laanterä et al., 2010).

According to Laanterä et al. (2010), the Mann-Whitney U test showed that mothers scored better on the breastfeeding knowledge test than fathers. Furthermore, participants scored better on the breastfeeding knowledge test if they had children, were non-smokers, lived with their spouse, were older than 25 years of age, and had academic degrees or higher vocational diplomas. There were no significant differences in breastfeeding knowledge scores in relation to income classes.

Laanterä and colleagues (2010) concluded from the data collected in this study that parents need more information on how to increase lactation and when to initiate complementary feeding according to the current recommendations. The researchers also recommended that counseling be highlighted for individuals younger than 26 years of age, less educated, are fathers, or are primiparas (Laanterä et al., 2010).
Although valuable information was gained in the Laanterä et al. (2010) study, there were identified limitations. Because a significantly larger percent of the participants in the study were older than 26 years of age, were from the middle-to-high income class, and had obtained higher education levels, the findings cannot be generalized to individuals who are younger than 26 years of age, from the lower-income class, or have lower education levels (Laanterä et al., 2010).

Chen, Johnson, and Rosenthal (2012) analyzed the association between breastfeeding duration and sources of education on breastfeeding and breast pumps. The Infant Feeding Practices Survey Study II (IFPS 11), a longitudinal mail survey, was used to collect the data. A sample of 2,586 of mothers from the seventh month of pregnancy through the infant’s first birthday who reported breastfeeding completed the survey. The IFPS 11 survey included detailed questions about sources of breastfeeding education and breast pump use, demographics, social and environmental factors, and infant factors. The IFSS II survey was developed by the Food and Drug Administration (FDA) in collaboration with the Centers of Disease Control and Prevention (CDC), which was comprised of members of a working group who had expertise of the various topics on the survey. All the questions on the survey were approved by the FDA’s human subjects review board committee and the United States Department of Management and Budget (Fenn, Labiner-Wolfe, Shealy, Chen, & Grummer-Strawn, 2008).

The study’s dependent variable was breastfeeding duration (Chen et al., 2012). The survey included questions on the age of the infant when the mother stopped completely breastfeeding and pumping milk. The purpose of this question was to divide women into two groups of mutually exclusive breastfeeding duration groups (Chen et al.,
2012). Short breastfeeding duration was defined as less than 2 months and long
breastfeeding duration was defined as \( \geq \) than 2 months. The dichotomy of the two groups
allowed researchers to analyze factors associated with initiating breastfeeding and
breastfeeding beyond initiation. Among the sample, 70% of the participants who
breastfed for 2 months or more, went on to breastfeed for 7 months or more. The
dichotomy of the groups allowed researchers to preserve the differences between the
groups (Chen et al., 2012)

The independent variables were the sources of education about breastfeeding
and breast pump use (Chen et al., 2012). The IFPS II survey response categories to assess
sources of breastfeeding education and breast pump education were: doctor or physician
assistant; nurse, nurse midwife, or nurse practitioner; nutritionists or dietitian; Women,
Infant, and Children (WIC) food programs; lactation consultant; relative or friends;
birthing or baby care classes; breastfeeding support group; telephone support helpline or
hotline; book or videos; and media, which contained several well-defined categories
(Chen, et al., 2012).

The study used \( \chi^2 \) and ANOVA to contrast categorical and continuous
variables. Logistic regressions were used to determine the association between
breastfeeding duration and sources of education about breastfeeding and breast pumps
(Chen et al., 2012). Results from this study found several sources of breastfeeding
education and breast pump education that were significantly associated with
breastfeeding duration. Multivariable logistic regression models revealed there was a
negative association between longer breastfeeding duration and receiving breastfeeding
education from a physician/physician assistant (OR: 0.58, 95% CI 0.36-0.93. A positive
association was found between longer breastfeeding duration and receiving breastfeeding education from classes/support groups (OR: 1.85, 95% CI: 1.24-2.76) and receiving breast pump education from friends/relatives (OR: 1.70, 95% CI: 1.13-2.25). Limitations included that the effects of education on all women could not be investigated because questions on breastfeeding education were not asked of women who did not breastfeed (Chen et al., 2012).

Chen et al. (2012) findings are relevant to this study as the Breastfeeding Knowledge Questionnaire (BKQ) tested low-income first-time women’s breastfeeding knowledge in seven breastfeeding domains. The BKQ tested women’s knowledge on breastfeeding before they had received formal breastfeeding education. Chen et al. study revealed important sources of breastfeeding education and breast pump education that were significantly associated with breastfeeding duration. Further research would be needed to analyze what influence the different sources of breastfeeding education and breast pump education had on acquisition of breastfeeding knowledge.

Transitional Statements

The key discovery in the Wambach and Cohen (2009) study on urban adolescent breastfeeding mothers revealed the main reason that mothers breastfed was for the health of their infant. Swanson and Power (2005), Racine et al. (2009), and Laanterä et al. (2010) studies all revealed common characteristics among mothers who breastfed and bottle-fed their infants. Swanson et al. (2005) and Laanterä et al. (2010) found bottle-feeding mothers were less likely to have obtained higher education levels. These results were similar to the findings in the Racine et al. (2009) study, which showed mothers who
had a high school degree or higher were at lower risk of breastfeeding cessation at any
time during the first year. Both studies by Swanson and Power (2005) and Racine et al.
(2009) showed correlations between a mother’s infant feeding choice and breastfeeding
duration and low-income status. Swanson and Power (2005) found mothers who bottle-
fed were more likely to come from lower social economic status. The Racine et al. (2009)
study showed mothers who participated in WIC at 2-4 months after the infant’s birth
were at increased risk for breastfeeding cessation. The Walsh et al. (2008) study
suggested infant-feeding classroom activities positively affected breastfeeding knowledge
and breastfeeding intentions among adolescents.

review revealed information on various breastfeeding variables that positively or
negatively affected a mother’s breastfeeding experience. Both studies found positive
correlations between breastfeeding initiation and continuation and breastfeeding support
during all the phases of becoming a mother. According to Wambach and Cohen (2009),
many adolescent mothers reported problems that led to their decision to wean, such as,
sore nipples, problems pumping, and work or school demands. Kaunonen et al. (2012)
noted that the benefits of breastfeeding peer support from trained supporters included
information on interventions that could help new mothers with their breastfeeding
problems and obstacles when professional support was not available.

Although all these studies have provided significant information concerning
factors affecting breastfeeding practices, there remains a gap in knowledge regarding
what low-income first-time pregnant women know about breastfeeding knowledge.
Research found there was a trend suggesting that as the cumulative length of
breastfeeding increased, so did breastfeeding knowledge; in particular, personal breastfeeding experience appears to be valuable for learning about practical, day-to-day breastfeeding management issues (Brodribb, Fallon, Jackson, & Hegney, 2008). The act of breastfeeding and complications faced during the process of breastfeeding can provide mothers with learning opportunities to problem-solve issues that they encounter. Lack of basic breastfeeding knowledge regarding breastfeeding mechanics and how to problem-solve challenges that arise could become factors that cause mothers to wean early because of overwhelming breastfeeding difficulties.

Chen et al. (2012) study found a negative association between longer breastfeeding duration and receiving breastfeeding education from a physician/physician assistant and a positive association was found between longer duration and receiving breastfeeding education from classes/support groups and friends/relatives. Although is study has provided valuable information, future research would be needed to analyze what breastfeeding knowledge women have acquired from the various sources and breastfeeding education.

There is a need to conduct research that might help identify the problems and obstacles hindering mothers from breastfeeding their babies. It is essential to identify the breastfeeding knowledge that mothers have to help promote it (Tengku & Sulaiman, 2010). The primary purpose of this study is to gain comprehensive information on what low-income first-time pregnant women know about breastfeeding benefits, mechanics, and problem solving.

Chapter III will present the study design, including the data collection and analysis procedures. Protection of human subjects will be thoroughly described.
CHAPTER III

RESEARCH METHODOLOGY

Introduction

This chapter describes the research methodology that was used to describe low-income first-time pregnant women’s breastfeeding knowledge. A discussion on the research design, theoretical underpinnings, population and sample, ethical considerations, data collection, analysis process, and methods that were used for this study are presented. In addition, the breastfeeding knowledge questionnaire and its application for this study are discussed.

Research Methodology

A quantitative descriptive design was used in this study, as it provided a means to answer the research question “What is the breastfeeding knowledge of low income first time women during pregnancy?” A descriptive research design is used to develop theory, identify problems with current practice, justify current practice, make judgments, or determine what others in similar situations are doing. In the quantitative descriptive design, variables are not manipulated, and there is no intervention or treatment tested (Burns & Grove, 2009). This design fit well with this study because the researcher aimed to describe knowledge levels of a single sample of low-income first-
Theoretical Underpinnings

According to Mercer (2004), becoming a mother (BAM) is a continual process of growth and change in the mothering role that begins during pregnancy and includes the social and psychological adjustments to pregnancy. For the purpose of this study, the researcher focused on Mercer’s (2006) first stage of BAM, which is a stage that occurs prior to the birth during pregnancy when expectations of the maternal role are explored; it is in this stage that a mother will make a decision on infant feeding choice. Because it is in this stage that pregnant women will make an important decision regarding infant feeding choice, it is important to understand what mothers know about breastfeeding as they enter into this decision making process. The researcher enrolled participants in this study who were specifically in the first stage of BAM, which is termed the *anticipatory stage* by Mercer and begins during pregnancy (Mercer, 2006).

Population and Sample

To gain access to the population sample, the researcher requested permission from the Deputy Director of Regional Services of rural county to conduct a study at the Women, Infants, and Children (WIC) Center where a low-income first-time mother population sample could be accessed.

Thirty women were recruited to participate in this study using a convenience sampling method. First inclusion criteria included “low-income,” as defined by WIC criteria: “gross income for the family is equal to or less than 185% of the U.S. Federal
Poverty Income Guidelines” (U.S. Department of Agriculture, Food, and Nutrition Service, 2012, “Income Requirement,” para. 1). Other inclusion criteria required that women be pregnant at the time of enrollment in the study, aged 18 or older, possess the ability to read English, and be in their first pregnancy. Demographics on participants’ ages, ethnicities, and levels of education were collected to allow the researcher to examine interacting characteristics that might influence a mother’s breastfeeding knowledge (see Appendix C).

Ethical Considerations

The researcher gained county approval for human subject research before enrolling WIC clients in the study to collect data. In addition, the researcher followed all required regulations set forth by California State University, Chico (CSUC) for the use of human subjects in research. The use of human subjects in research at CSUC is governed by Executive Memorandum 93-04 and by the policies of the University Human Subjects in Research Committee, which follow the Code of Federal Regulations for the protection of human subjects. Furthermore, the researcher followed the process outlined by CSUC to obtain the Institutional Review Board (IRB) approval to conduct this research project.

There are five human rights that require protection in research: “(1) the right to self-determination, (2) the right to privacy, (3) the right to anonymity and confidentiality, (4) the right to fair treatment, and (5) the right to protection from discomfort and harm” (Burns & Grove, 2009, p. 189). The researcher took action to protect the human rights of the participants in this study. As participants voluntarily
agreed to participate in this study, the participants were asked to read and sign a consent form that addressed human rights protection (see Appendix A).

The researcher ensured the research subjects’ right to self-determination by informing the subjects about the proposed study and allowing them to choose to participate in the study or not. The researcher provided subjects written information that explained the procedures and purpose of the study, and the researcher was available to answer any of the participant’s questions about the study. Participants were informed that the services provided from Women, Infants, and Children (WIC) Center would not be affected if they decided not to participate in the study.

To ensure all subjects the right to privacy and right to anonymity and confidentiality the researcher de-identified patient information. All Breastfeeding Knowledge Questionnaires (BKA) were assigned a number, and no one person’s name or identity was associated with any specific questionnaire (see Appendix B). The researcher provided written information within the research consent that explained that the participant’s identity would not be revealed while the study was conducted. In addition, subjects received written information that explained that their identities would remain anonymous in the presentations, reports, and publications of the study. Participants were brought to a private room at the WIC Center to fill out the questionnaire. Participants were allowed to withdraw from the study at any point. The researcher explained to subjects that the questionnaires would be collected by the researcher, kept confidential, and stored in a secure place. Data collected from the study were shared with the researcher’s CSUC graduate committee and may be shared in a published article. No data were linked with any participant’s identity.
The researcher ensured that all subjects receive fair treatment and was protected from discomfort and harm. Participants were told of risks, side effects or discomforts that could be expected from the research. Care was taken to provide subjects a comfortable, quiet, and private location to complete the questionnaire. Subjects were offered a snack and water prior to taking the questionnaire. The researcher conducted research steps and the data collection process in a consistent manner to ensure fairness. Participants were encouraged to ask any questions concerning the research before giving consent to participate in the study.

Data Collection Steps

1. The researcher obtained permission to conduct a research study at the WIC Center location and CSUC.

2. Prior to collecting data, 30 folders were labeled with an ID number. Each folder contained a BKQ, data collection sheet, and research consent form that were labeled with a matching folder ID number. In addition, a binder was labeled as the “master” binder to store data for all statistical analyses.

3. Colorful posters were displayed at the entrance of the WIC Center. Poster information invited women who were first-time mothers to participate in the study. Extraneous variables in this study included the number of children mothers had and the number of children they have breastfed. To control extraneous variables, inclusion criteria were applied. To meet inclusion criteria, mothers must have been enrolled in the WIC program, be first-time mothers, and be pregnant at the time of the study. Criteria included participants’ ability to read at a fifth-grade level and be English speaking.
Participants were required to be the age of 18 or older. Posters directed those who were interested to a nearby display table where study information and consent forms were provided.

4. The table was set up with informational flyers, consent forms, questionnaires, pink and blue baby bootie gifts, and a plate of oatmeal raisin granola bars and water.

5. Participants were greeted and offered a snack and water upon their arrival to the table. The researcher was available to explain the study and answer questions participants had.

6. After the first participants were given study information and agreed to participate in the study, a color-coded folder was opened, and the participant was given a consent form from that pre-labeled folder to sign; the signed consent was checked for completion and placed back in the color-coded folder.

7. If a woman decided not to participate for some reason, the stated reason was recorded in the master binder.

8. Participants were handed an ID number-coded questionnaire and directed to a quiet private place to complete the questionnaire. The participant was instructed to return to the display table when the questionnaire was completed.

9. When the participant returned to the display table with the questionnaire, the questionnaire was checked for completion of all questions. If questions were left blank or more than one answer was selected, the researcher asked the participant for clarification and adjusted answers based on the participant’s clarification. The completed, color-coded questionnaire with ID number was placed in the participant’s corresponding color-coded folder.
10. Participants were offered a baby bootie gift as a thank-you gesture for their time.

11. The data collection process continued in a consistent manner until 30 participants were recruited.

12. After 30 participants were recruited and all consents and questionnaires were completed and accounted for, all data were collected and placed in a secure place.

13. Information was then carefully entered into Excel and backed up in two secure places.

Data Analyses Process

The researcher collected both ordinal and nominal data. Participants were asked to complete the breastfeeding questionnaire written in English, and means and frequency scores were calculated from questionnaire results. In addition, data were collected on participants’ infant feeding intentions. Demographics such as age, ethnicity, and level of education were collected to allow the researcher to examine interacting characteristics that might influence a mother’s breastfeeding knowledge. Minitab 16 Statistical Software was utilized to perform a one-sample t-test to calculate the group means, standard deviation, and confidence interval on the breastfeeding questionnaire scores. In addition, Minitab 16 Statistical Software was used to create a regression with a group scatterplot chart to analyze trends between a participant’s educational level, age, and total breastfeeding scores.
Methods

The researcher reviewed different measurement strategies and measurement instruments that would be appropriate for the purpose of this study. To gain information on pregnant women’s comprehensive breastfeeding knowledge, the researcher developed a Breastfeeding Knowledge Questionnaire (BKQ). The BKQ contained seven domains and two questions were listed under each domain with a total of 14 items listed. Each item of the questionnaire had three categorical responses of “true,” “false,” or “not sure.” A correct response scored a “1,” and a wrong and or “not sure” response scored a “0.”

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

Transition Statements

In summary, the quantitative descriptive research design was used in this study to describe breastfeeding knowledge levels of a single sample of low-income first-time women with no intervention or treatment tested. Content validity on the BKQ was approved by a panel of three experts on breastfeeding. The utilization of the quantitative typical descriptive research design helped identify areas where breastfeeding knowledge deficits exist. The information gained from this study can be applied to the development of future breastfeeding promotion and educational interventions. The next chapter includes information on findings and statistical analysis.
CHAPTER IV

RESULTS

Introduction

The researcher analyzed the breastfeeding knowledge questionnaires (BKQ) and demographic information collected from the participants. The data included characteristics such as the participants’ age, education, intent to breastfeed, and race. The BKQ was specifically designed to help answer the research question, “What is the breastfeeding knowledge of low-income first-time women during pregnancy?”

The BKQ has seven domains and each domain tested a specific topic on breastfeeding knowledge. With the breastfeeding questions broken down into specific topic areas, variances in the sample group’s comprehensive breastfeeding knowledge and the breastfeeding knowledge within the specific domain topics were analyzed. The data analysis measured the BKQ domains and total score results to obtain the mean, confidence interval, and standard deviation statistics. Using Minitab 16 Statistical Software, the researcher examined the relationships between the total breastfeeding knowledge scores and demographic data calculated on age and education frequencies.

Sample Characteristics

Thirty first-time, low-income women from a Woman, Infant, and Children office participated in the study. Demographic characteristics are described in Table 1.
Table 1

Description of the Participants

<table>
<thead>
<tr>
<th>Demographics</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years)</td>
<td>$n = 30$</td>
<td></td>
</tr>
<tr>
<td>1. 18-28</td>
<td>18</td>
<td>60</td>
</tr>
<tr>
<td>2. 29-39</td>
<td>12</td>
<td>40</td>
</tr>
<tr>
<td>Education</td>
<td>$n = 30$</td>
<td></td>
</tr>
<tr>
<td>1. High school or no high school</td>
<td>15</td>
<td>50</td>
</tr>
<tr>
<td>2. College</td>
<td>15</td>
<td>50</td>
</tr>
<tr>
<td>Intent to breastfed</td>
<td>$n = 30$</td>
<td></td>
</tr>
<tr>
<td>1. Yes</td>
<td>30</td>
<td>100</td>
</tr>
<tr>
<td>2. No</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>Race</td>
<td>$n = 30$</td>
<td></td>
</tr>
<tr>
<td>1. White, non-Hispanic</td>
<td>25</td>
<td>83.3</td>
</tr>
<tr>
<td>2. African American</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>3. Asian</td>
<td>2</td>
<td>6.7</td>
</tr>
<tr>
<td>4. Hispanic</td>
<td>3</td>
<td>10.0</td>
</tr>
</tbody>
</table>

Knowledge of Breastfeeding

Minitab 16 Statistical Software was utilized to perform a one-sample t-test to calculate the group mean, standard deviation, and confidence interval for the total score and for each of the seven breastfeeding knowledge domains. The BKQ contained seven domains with two questions and two points possible for each domain, for a total of 14 possible points. The breastfeeding knowledge data results are shown in Table 2. The results revealed gaps in breastfeeding knowledge in that the group scores for each domain were lower in domains 1, 2, 5, and 6 than they were in domains 3, 4, and 7. Domain five, which contained two questions on breastfeeding problem solving, had the lowest mean score (0.97 +/- 0.669). The second-lowest group mean score (1.133 +/- 0.819) was in
Table 2

*Domain and Total Score Results*

<table>
<thead>
<tr>
<th>Variables</th>
<th>N</th>
<th>Mean</th>
<th>StDev</th>
<th>SE Mean</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Domain 1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Breastfeeding benefits for the mother</td>
<td>30</td>
<td>1.167</td>
<td>0.791</td>
<td>0.145</td>
<td>(0.871, 1.462)</td>
</tr>
<tr>
<td>Domain 2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Breastfeeding benefits for infant</td>
<td>30</td>
<td>1.333</td>
<td>0.711</td>
<td>0.130</td>
<td>(1.068, 1.599)</td>
</tr>
<tr>
<td>Domain 3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Breast milk components</td>
<td>30</td>
<td>1.500</td>
<td>0.630</td>
<td>0.115</td>
<td>(1.265, 1.735)</td>
</tr>
<tr>
<td>Domain 4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Breastfeeding mechanics</td>
<td>30</td>
<td>1.500</td>
<td>0.682</td>
<td>0.125</td>
<td>(1.245, 1.755)</td>
</tr>
<tr>
<td>Domain 5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Breastfeeding problem-solving</td>
<td>30</td>
<td>0.967</td>
<td>0.669</td>
<td>0.122</td>
<td>(0.717, 1.216)</td>
</tr>
<tr>
<td>Domain 6</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Time and frequency of feedings</td>
<td>30</td>
<td>1.133</td>
<td>0.819</td>
<td>0.150</td>
<td>(0.827, 1.439)</td>
</tr>
<tr>
<td>Domain 7</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Breast milk production</td>
<td>30</td>
<td>1.433</td>
<td>0.679</td>
<td>0.124</td>
<td>(1.180, 1.687)</td>
</tr>
<tr>
<td>Total</td>
<td>30</td>
<td>9.033</td>
<td>2.723</td>
<td>0.497</td>
<td>(8.017, 10.050)</td>
</tr>
</tbody>
</table>

**Two-sample t-test for high school or no high school vs college**

| High School or No High School | 15 | 60.91 | 21.24 | 5.48 | (49.15, 72.67) |
| College                      | 15 | 68.06 | 17.47 | 4.51 | (58.39, 77.73) |

**Two-sample t-test for total mean percent score for age**

| Age 18-28 | 18 | 59.1 | 18.6 | 4.4  |
| Age 29-39 | 12 | 72.6 | 18.5 | 5.3  |

* p-value = 0.323

*95% CI for difference: (-27.80, 0.80), p-value = 0.063

domain six, which tested the mother’s knowledge on time and frequency of
breastfeeding. The third- and fourth-lowest domain mean scores were in domain two
(1.333+/- 0.711), on the topic of breastfeeding benefits for the infant, and domain one
(1.167+/- 0.791), on the topic of breastfeeding benefits for the mother. Differences in
group domain scores are depicted in Figure 2. The group total score mean was (9.033 +/- 2.723).

Figure 2. Mean group score for each domain.

Breastfeeding Knowledge Scores, Education, and Age

Relationships between the total breastfeeding knowledge scores and demographic data calculated on age and education frequencies were analyzed. Using Minitab 16 Statistical Software, data were entered to create a regression with a group scatterplot chart (Figure 3). The scatterplot chart revealed trends between a participant’s educational level, age, and total breastfeeding scores. The scatterplot showed a positive trend toward higher breastfeeding scores among older participants with a college education. A negative trend toward lower breastfeeding scores was found among older women who reported high school or lower as their highest level of education.

Two-sample t-tests and confidence intervals were performed to determine if age and education was significant variables that affected participant total group scores.
The participants between 18 to 28 years of age \((n = 18)\) had a lower mean total score (59.1%) than the older participants \((n = 12)\) between ages 29 to 39 that had a mean group score of (72.6%). The difference between the group means scores in the two age groups was not significant \((p = 0.063)\). In addition, the two-sample t-test and confidence interval results showed that education was not a factor that significantly affected total group mean score \((p = 0.324)\). Although the results show age and education were not significant variables that affected total means scores, the group mean score \((n = 30)\) was (64.48%).

To determine if age or education were significant variables that affected domain scores, two-sample t-tests and confidence intervals were performed. Results revealed that a participant’s age was a significant variable that affected scores in domains three and six. Participants aged 18 to 28 scored significantly lower in domain three, on
breast milk components \((p = 0.05)\) and domain six, on time and frequency of breastfeeding \((p = 0.036)\) than did participants aged 29 to 39. Two-sample t-tests and confidence intervals calculated for education did not reveal education to be a significant variable affecting participants’ scores in the seven domains.

Transitional Statements

The study results revealed trends, significant findings, and gaps in breastfeeding knowledge among this population of low-income first-time pregnant mothers. The scatterplot shows a tendency toward higher breastfeeding total scores among older participants with a college education, yet a trend toward lower breastfeeding total scores was found among older women who reported high school or lower as their highest level of education. Variances among the seven domain group mean scores were discovered which revealed that the participants group mean scores were lower in domains 1, 2, 5, and 6. Age was a significant factor affecting lower breastfeeding scores in domains 3 and 6, especially among younger women, ages 18 to 28. Discussion regarding the meaning of these findings is found in Chapter V.
CHAPTER V

DISCUSSION

Introduction

The Healthy People 2020 breastfeeding objectives are to increase the percentage of infants who are breastfed to 81.9%. In addition, the objectives aim to increase the percentage of babies who are exclusively breastfed for 6 months to 25.5% (CDC, 2013). Research shows lower breastfeeding initiation rates and shorter breastfeeding duration among mothers of low-income status (Thulier & Mercer, 2009). According to a Michigan State University (2012) study, less than 2 percent of low-income mothers met breastfeeding recommendations, which was an extreme decline compared to a more affluent population.

A number of variables influence breastfeeding rates, including a woman’s age, level of education, and socioeconomic status (Thulier & Mercer, 2009). Social Role Preparation, Mother-Infant Attachment Promotion, Mother-Infant Interaction Focused Education, Infant Caregiving Instruction, and Therapeutic Relationships are the five environmental variables that were described in Mercer’s BAM theoretical model as having the potential to influence the process of becoming a mother (Mercer & Walker, 2006). The breastfeeding education a mother receives can be a factor that affects the process of becoming a mother. Obtaining information on a mother’s baseline breastfeeding knowledge can provide breastfeeding educators with information to
effectively plan educational breastfeeding programs that address areas of strengths and weaknesses. The results of this study expand on the information available from the perspective of first-time, low-income pregnant women concerning their breastfeeding knowledge base.

A discussion on the results of the study with respect to the group domain mean scores and group total mean score is provided. The comprehensive results in relation to the participants’ age and education levels are then discussed. This chapter concludes with information on the study’s limitations and the implications this research may have on nursing, education, and future research.

Domain Scores and Breastfeeding Benefits

The BKQ tested a women’s breastfeeding knowledge in seven domains on 1) breastfeeding benefits for mother; 2) breastfeeding benefits for infant; 3) breast milk components; 4) breastfeeding mechanics; 5) breastfeeding problem-solving; 6) time and frequency of feedings; and 7) breast milk production. The lowest group mean scores were found in topics that tested women’s knowledge on breastfeeding benefits for mother and infants, breastfeeding problem-solving, and time and frequency of feedings. According to Wambach and Cohen (2009), the main reason mothers breastfed was for the health of their infant. To make an informed decision regarding infant feeding choice, it is important for expectant mothers to know the benefits of breastfeeding.

Possible explanation for lower scores on breastfeeding benefits for mother and infant, in this study, may be related to the socioeconomic status of this sample. All respondents met Women, Infant and Children (WIC) low-income eligibility guidelines.
Women from lower social economic status are more likely to lack knowledge about the benefits of breastfeeding and are likely to be targeted for aggressive promotion of infant formula permitted in many hospitals, mainly in the United States (Centers for American Progress, 2013). This information supports a need for educational interventions that are aimed to provide low-income pregnant women with breastfeeding information that emphasizes the benefits of breastfeeding.

Domain Scores and Problem-Solving

Although a mother’s knowledge of breastfeeding benefits may be a factor that influences her intent to breastfeed, a mother’s lack of knowledge regarding breastfeeding problem-solving may lead to her decision to discontinue breastfeeding soon after she starts breastfeeding. Breastfeeding nurse educators cannot assume pregnant women and new mothers have acquired a comprehensive breastfeeding knowledge base to resolve breastfeeding problems. The results in this study revealed the lowest group mean scores were found the topics that tested the respondents’ knowledge on breastfeeding problem-solving and the time and frequency of breastfeeding. These findings mirror Wambach and Cohen’s (2009) findings on postnatal teen breastfeeding experiences in which a majority of mothers reported breastfeeding problems, predominantly in learning the mechanics of breastfeeding. The main reasons reported for early weaning were perceived low milk supply, difficulty getting infants to latch, sore nipples, and a busy work schedule (Wambach & Cohen, 2009).

The low group mean scores found on the topics that tested the respondents’ knowledge on breastfeeding problem-solving and the time and frequency of feedings
reveal areas that educational interventions can target. According to a Michigan State University (2012) study, many women reported that the main reason they discontinued breastfeeding was because they felt there was nowhere to seek help when breastfeeding became difficult. Low-income breastfeeding moms returning to work or school will need to learn how to solve issues that more affluent stay-at-home mothers may never encounter (Michigan State University, 2012). Low-income breastfeeding working mothers will need to know where to find an affordable breast pump, where they can pump milk at work, how often they will need to pump their breasts, and how and where to store their breast milk. Furthermore, low-income mothers who are minimum-wage service workers may find it challenging to negotiate private locations and break times to pump their breasts at work (Michigan State University, 2012). A working mother’s lack of breastfeeding knowledge could lead to her inability to solve breastfeeding problems that could otherwise be prevented. For example, if working mothers are not provided adequate times to pump milk at work, they could encounter problems maintaining their breast milk supply. In addition, inadequate breast-pumping times could lead to other breastfeeding problems such as plugged ducts, breast engorgement, and mastitis (Michigan State University, 2012).

The low group mean scores found on participants’ knowledge on breastfeeding problem-solving show that low-income first-time pregnant women may need education on how and where to access informational resources that help support breastfeeding mothers. To negotiate adequate breastfeeding support in the work place, breastfeeding mothers need to know what their employee breastfeeding rights are. A new federal law “Break Time for Nursing Mothers” passed in March 2010 provides new
rights to nursing employees (United States Breastfeeding Committee, 2013). The Patient Protection and Affordable Care Act of Section 7 of the Fair Standard Labor Act of 1938 (29 U.S.C. 207) was amended and now requires employers to offer a reasonable break time for an employee to express their breast milk for her breastfed child up to 1 year after the child’s birth each time the employee has the need to express the milk. In addition, the new law requires employers to provide a place, other than a bathroom, that is private and away from intrusion from coworkers and the public, which may be used by an employee to express breast milk. The “Break Time for Nursing Mothers” federal law states an employer is not required to compensate an employee receiving reasonable break time. Furthermore, the law states, “an employer that employs less than 50 employees shall not be subject to the requirements of this subsection, if such requirements would impose an undue hardship by causing the employer significant difficulty or expense when considered in relation to the size, financial resources, nature, or structure of the employer’s business” (United Stated Department of Labor, 2010, p.1).

When compared to breast feeders, bottle-feeders significantly were younger ($p < 0.001$), more likely to be single ($p < 0.01$), had less full-time education (Swanson & Power, 2005). The larger number of younger participants within the sample group may have contributed to the low mean scores found in domain 5 on breastfeeding problem-solving and domain 6 on time and frequency of feedings. Compared to the older participants, the younger participants may not know peer supporters their age who have experienced breastfeeding.

According to Mercer’s (2004) theoretical framework, the first stage of becoming a mother occurs during pregnancy when women move from one reality to
another, acknowledge the essential change, and seek out information from role models. According to Chen et al. (2012) study, a positive association was found between longer duration and receiving breastfeeding education from friends/relatives. As pregnancy rates for women in their early 20s declined to the lowest level in more than three decades (CDC, 2012), women who become pregnant in the early 20s may be less likely to have friends their age who have experienced breastfeeding. Personal breastfeeding experience appears to be valuable for learning about practical, day-to-day breastfeeding management issues (Brodribb et al., 2008). If first-time pregnant women are able to receive peer support from women who breastfeed, the connection could provide an opportunity for pregnant women to learn how to problem-solve or prevent breastfeeding problems.

The findings on low mean scores found on breastfeeding problem solving among this sample of low-income pregnant women has identified an area where peer support interventions could have a positive impact. According to Jolly et al. (2012), peer support interventions in low or middle-income countries ($p < 0.001$) had a significant impact on breastfeeding initiation in comparison to high income countries. With peer support interventions the number of women from low income countries who did not breast fed at all was reduced by 30% (relative risk 0.70, 95% confidence interval 0.60 to 0.82) compared to a 7% reduction (0.93, 0.87 to 1.00) in higher income countries (Jolly et al., 2012).

The highest group mean score was found in domain 4, which tested a participant’s knowledge on breastfeeding mechanics. Though a woman’s knowledge on breastfeeding mechanics may help prevent breastfeeding problems, knowledge on breastfeeding mechanics alone may not reflect that an individual has achieved the
practical skills and problem-solving knowledge needed to achieve breastfeeding success. During the first few weeks of breastfeeding a new mother may need to learn how to seek out and access information from resources that they have at hand. Breastfeeding educators can play a vital role in directing pregnant women to reliable evidence-based breastfeeding informational sites to help mothers to problem-solve breastfeeding issues.

Group Total Score Discussion

Although this study revealed areas in which this sample group scored lower in certain breastfeeding topic domains compared to the other domains, results showed a low total comprehensive group mean score of only \((n = 30) 64.5\%\). Subjects who participated in this study had not received any focused breastfeeding class instructions at a Women, Infants, and Children (WIC) office. One possible explanation for the low comprehensive group mean scores in the sample group may be related to the lack of breastfeeding education at the WIC office prior to their participation in the study. Although this was a descriptive study to obtain information on first-time, low-income pregnant women’s baseline breastfeeding knowledge, future quantitative comparison studies could provide information on the difference between women who received focused breastfeeding education and those who did not.

Budgetary Challenges to Support Breastfeeding

Another possible explanation for the low comprehensive group mean scores in this study may be related to the amount of breastfeeding education opportunities available from local hospitals. As hospitals encounter budget cuts, healthcare is facing difficulties
in preparing first-time pregnant women for the challenges of breastfeeding. Often the targeted budget cuts occur in hospitals that care for low-income Americans (Mukerjee, 2013).

The low comprehensive group mean scores revealed there is a need for diverse breastfeeding interventions that address the different breastfeeding educational needs that women encountered throughout the various stages of becoming a mother. Many breastfeeding challenges that mothers experience occur during the first few weeks after the mother gives birth. Breastfeeding problems such as engorgement, plugged ducts, sore nipples, and mastitis cause discomfort and pain that can result in mothers discontinuing breastfeeding. Without adequate educational support new mothers may not know that many breastfeeding problems are temporary and can be easily resolved with proper treatment. Kaunonen et al. (2012) finding showed that a combination of professional and peer support from trained breastfeeding supporters was effective in increasing breastfeeding duration.

The World Health Organization (WHO) and the United Nations Children’s Fund (UNICEF) designed a Baby Friendly Hospital Initiative (BFHI), which is a program developed to guide hospitals in helping mothers to learn how to breastfeed. Although BFHI indicates best practices in maternity care to support breastfeeding mothers, less than 5% of U.S. infants are born in Baby-Friendly hospitals (CDC, 2013). The Hospital Infant Feeding Act (S.B.No. 502) requires that every California hospital providing maternity care must provide breastfeeding consultations or provide information to the mother on where to receive breastfeeding information. A new section of the Hospital Infant Feeding Act has been added and now requires hospitals in California to have an
infant feeding policy that promotes breastfeeding guided by either the BFHI or the State Department of Public Health Model Hospital Policy that contains recently updated guidelines approved and published by the State Department of Public Health (California Senate Bill-502, 2011).

Breastfeeding Knowledge, Age, and Education

Findings demonstrated a positive trend toward higher breastfeeding scores among older participants with a college education ($n = 15$). This could possibly be related to exposure of breastfeeding education in the college setting. College students may have learned about breastfeeding benefits from social interactions with other people within the college setting or in courses such as nutrition, human development, or biology. In addition, results showed a negative trend in breastfeeding scores among older women who reported high school or lower as their highest level of education. This finding could indicate that the longer women are away from educational settings, which provide opportunities for informational exchanges and social interactions, the more likely they will not be exposed to breastfeeding information.

Walsh et al.’s (2008) study showed a positive correlation between infant-feeding classroom activities and breastfeeding knowledge and intentions toward breastfeeding in adolescents. Because many women may never attend college, providing breastfeeding education in high school may be the only focused breastfeeding education women receives before becoming pregnant (Walsh et al., 2008).

The total group means score of 64.48% on participant’s comprehensive breastfeeding knowledge, provided insight on the need for breastfeeding education
interventions that address various breastfeeding topics. Chezem, Friesen, and Boettcher’s (2003) study found that, although breastfeeding knowledge and confidence were positively correlated, it was only breastfeeding knowledge that appeared to influence breastfeeding duration and goals. Breastfeeding questionnaire scores were strongly associated with both the length of lactation and achievement of breastfeeding goals. The results of Chezem et al. (2003) study and the results of this study both highlight the importance of breastfeeding education.

**Limitations of Study**

There are a few characteristics of this study that limit the application of the results. Most notably, the sample size was relatively small and all the women in the sample intended to breastfeed. The representation of all the ethnic and racial groups was limited. Nearly all the women \( n = 25 \) in the sample were White or non-Hispanic.

**Implications for Nursing Education**

Nurses and maternal child health professionals are often in a position to provide education. The results of this study revealed that the participants scored lowest on breastfeeding benefits and breastfeeding problem solving. The information revealed in this study could guide nurses and breastfeeding educators in developing breastfeeding education that addresses areas where weaknesses were found. It is important for nurses to provide breastfeeding information during a woman’s pregnancy to help women make informed decisions regarding their infant feeding choice. Although acquiring knowledge on breastfeeding benefits may increase a woman’s intention to breastfeed, it is also
Important for women to obtain knowledge on breastfeeding problem solving to help them achieve a longer duration of breastfeeding.

Implications for Nursing Practice

Nurses often play a vital role in identifying patients’ needs, implementing patient education, and providing patients with resource support. Information gained in this study revealed that the participants’ lowest group mean scores were found on the topics of breastfeeding benefits for the mother and infant, breastfeeding mechanics, and breastfeeding problem-solving. This information can help nurses to target breastfeeding interventions on topics where low group means scores were found.

In nursing practice clinical reasoning involves the ability to reason as clinical situations change (Benner, Sutpher, Leonard, & Day, 2010). Information on the findings on low mean scores found on the different topic areas can be used to help nurses identify and predict the educational needs of their patients as they pass through different phases of motherhood. For example, the information on the low scores found on the topic of breastfeeding problem-solving help nurses to anticipate resource support new mothers may need after they are discharge from the hospital. Nurses can play a vital role in referring first-time low-income mothers to programs that provide peer support. Peer support can provide problem-solving learning experiences that can help first-time pregnant women deal with challenging situations that require preparation such as returning to work, school, and busy schedule (Kaunonen et al., 2012).
Implications for Research

Factors that hinder a low-income mother’s decisions to breastfeed and to continue to breastfeed should be acknowledged in research to effectively guide healthcare breastfeeding promotion among at-risk populations. Suggestions for future research include further studies to compare the BKQ results of this study with other BKQ results from different socio-economic population groups. Other suggestions for future research include comparison of pre- and post-BKQ scores between two different breastfeeding educational programs.

Conclusions

The current study adds to information that can be used to improve breastfeeding education among first-time, low-income pregnant women. The low comprehensive group mean scores indicate there is a need for breastfeeding education. The Healthy People 2020 breastfeeding objectives aim to increase the percentage of babies who are exclusively breastfed for six months to 25.5% (CDC, 2013). The lowest domain mean scores which tested breastfeeding problem solving indicates women need breastfeeding education that addresses the problem-solving skills needed to achieve the Healthy People 2020 breastfeeding objectives. Obtaining information on a mother’s baseline breastfeeding knowledge can provide breastfeeding educators with information to more effectively plan breastfeeding education programs. Information gained from this study could assist breastfeeding educators who work with first-time, low-income women. Breastfeeding and peer support programs designed to include education in all seven domain areas can provide comprehensive knowledge that is tailored to the needs of low-
income first-time pregnant women to help increase breastfeeding initiation rates and breastfeeding duration objectives as describe by Healthy People 2020.
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REFERENCES


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APPENDIX A
Consent Form

Introduction

This study is being conducted by Felicia Dreesmann (RN, BSN) through CSUC in cooperation with the Breast Feeding Support Center of Redding. This study and its procedures have been approved by the institutional review board at CSUC and the Breast Feeding Center of Redding. The purpose of this study is to gain information on low-income first-time-pregnant women’s breastfeeding knowledge. The procedure will include your response to a questionnaire that will ask you questions about breastfeeding benefits and breastfeeding techniques.

Risks and Discomfort

There are no known risks or discomforts associated with this questionnaire. Participation will take approximately 30 minutes.

Benefits

Although this study may not benefit you directly, it will provide information that might enable health care professionals to identify areas where breastfeeding knowledge is strong or weak. Information gained from this study may help in the planning and designing of future breastfeeding educational interventions.

Confidentiality

All questionnaires will be assigned a number, and no one person’s name will be associated with any specific questionnaire. Your identity will not be revealed while the study is
being conducted or when the study is reported or published. Questionnaires will be collected by Felicia Dreesmann, kept confidential, and stored in a secure place. Data collected from the study will be shared with Felicia Dreesmann’s CSUC mentor and in publications, reports, and presentations of this study.

**Participation and Withdrawal**

Your participation in this study is completely voluntary, and there is no penalty if you decide not to participate in the study. Your participation in the study is without paid compensation. You have the right to withdraw from the study at any time without any effects to the service you receive at the Breast Feeding Support Center.

**Questions**

You are free to ask questions regarding the study or about being a subject and you may call Felicia Dreesmann (RN, BSN) at (530) 222-5772 or e-mail her at kellydreesmann@charter.net if you have further questions.

I have read this consent form and voluntarily consent to participate in this study.

Participant’s signature and date: ________________________________

I have explained this study to the above subject and have sought her understanding.

Investigator’s signature and date: ________________________________
APPENDIX B
Breastfeeding Questionnaire

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

1. = True
2. = False
3. = Unsure

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

For each statement below write the number that closely corresponds to your answer.

<table>
<thead>
<tr>
<th>Demographics</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Subject Identification Number</td>
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</tr>
<tr>
<td>Age</td>
<td></td>
</tr>
<tr>
<td>Education background</td>
<td></td>
</tr>
<tr>
<td>1. High School</td>
<td></td>
</tr>
<tr>
<td>2. No High School Diploma</td>
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</tr>
<tr>
<td>3. College or more</td>
<td></td>
</tr>
<tr>
<td>Intention to breastfeed</td>
<td></td>
</tr>
<tr>
<td>1. yes</td>
<td></td>
</tr>
<tr>
<td>2. no</td>
<td></td>
</tr>
<tr>
<td>Race</td>
<td></td>
</tr>
<tr>
<td>1. White, non-Hispanic</td>
<td></td>
</tr>
<tr>
<td>2. Afican American</td>
<td></td>
</tr>
<tr>
<td>3. Asian</td>
<td></td>
</tr>
<tr>
<td>4. Hispanic</td>
<td></td>
</tr>
</tbody>
</table>