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## THE FACTORS THAT INFLUENCE DURATION OF EXCLUSIVE BREASTFEEDING: A MIXED METHODS DESIGN

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Roxanne K. Bowman, Student

Dr. Debra Anderson, Major Professor

Dr. Terry Lennie, Director of Graduate Studies

THE FACTORS THAT INFLUENCE DURATION OF EXCLUSIVE  
BREASTFEEDING: A MIXED METHODS DESIGN

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DISSERTATION

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A dissertation submitted in partial fulfillment of the requirements  
for the degree of Doctor of Philosophy in the  
College of Nursing at the  
University of Kentucky

By  
Roxanne K. Bowman

Lexington, Kentucky

Director: Dr. Debra Anderson, Professor of Nursing

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Lexington, Kentucky

2013

## ABSTRACT OF DISSERTATION

### THE FACTORS THAT INFLUENCE DURATION OF EXCLUSIVE BREASTFEEDING: A MIXED METHODS DESIGN

Breastfeeding is the gold standard of infant feeding and its benefits extend beyond the mother and child. Multiple organizations recommend exclusive breastfeeding for the first six months of an infant's life. Exclusive breastfeeding rates nationally and in the state of Kentucky fall below the Healthy People 2020 goals. A mother's intention to breastfeed has been shown to impact actual breastfeeding behavior. The current state of the measurement of intention was explored through a literature review. A majority of the measures were single item scales. The reliability and validity of the scales should be further tested in diverse populations.

The purposes of this dissertation were to: a) explore the role of breastfeeding intention on duration of exclusive breastfeeding, and b) determine the common modifiable factors among women who breastfeed exclusively for at least four months. English speaking mothers 18 years of age and older were asked to participate if they had delivered a healthy infant in the last 72 hours and if they intended to feed their baby some amount of breast milk (n = 84). Mothers were followed for 16 weeks or until they weaned their infant, whichever came first. Social support, breastfeeding self-efficacy and breastfeeding intention were measured at baseline. Breastfeeding support and breastfeeding self-efficacy were measured at four and 16 weeks. Results indicated that mothers with stronger intention to breastfeed were more likely to breastfeed exclusively for a longer period of time. Mothers who breastfed their infant exclusively for 16 weeks were asked to participate in one of two focus group meetings (n = 15). The following five themes emerged from the data: 1) knowledge, 2) peer experience, 3) support, 4) perseverance, and 5) the public.

KEYWORDS: exclusive; breastfeed; duration; intention; support

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Student's Signature

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Date

THE FACTORS THAT INFLUENCE DURATION OF EXCLUSIVE  
BREASTFEEDING: A MIXED METHODS DESIGN

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## Chapter One

### Background

Exclusive breastfeeding is the most efficacious form of infant feeding for the first six months of life. The United States Breastfeeding Committee (USBC) and the American Academy of Pediatrics (AAP) state that breastfeeding is the physiologically normal form of infant and child feeding (Labbok & Taylor, 2008; AAP, 2012). As such, breastfeeding should be fostered and encouraged by health care professionals and public health campaigns in order to normalize it within our culture. Multiple organizations endorse breast milk as the optimal source of nutrition for infants (American Academy of Family Physicians [AAFP], 2008; AAP, 2012; USBC, 2009; United States Department of Health and Human Services [USDHHS], 2011; World Health Organization [WHO], 2001). These organizations support exclusive breastfeeding for the first six months of an infant's life for multiple reasons.

The benefits of breastfeeding extend beyond the mother and baby and cause positive health and economic changes locally and globally (Murtagh & Moulton , 2011). Infants who are breastfed have a lower risk of developing upper respiratory infections, otitis media, diarrheal illnesses, diabetes mellitus, allergies, asthma, and SIDS compared to infants who are fed formula (AAP, 2012; Chantry, Howard, & Auinger, 2006; Heinig & Dewey, 1996; Lopez-Alarcon, Villalpando, & Fajardo, 1997; McNeil, Labbok, & Abrahams, 2010; Vennemann et al., 2009). In the United States (U.S.) an infant who is fed formula costs the health care system an additional \$331-475 during the first year of life, compared

to an infant who is breastfed (Ball & Wright, 1999). Considering the 4.1 million babies who were born in the U.S. in 2009 (Hamilton, Martin, & Ventura, 2010), the health care savings of breastfeeding are significant. Bartick and Reinhold (2010) estimated that if 90% of mothers in the U.S. breastfed their babies exclusively for six months, it would save the U.S. \$13 billion dollars a year and prevent 911 deaths annually. Since breastfed babies contract fewer illnesses, parents of breastfed babies miss less work. Fewer days off work translate into increased productivity for their employers (Ball & Bennett, 2001; Murtagh & Moulton, 2011). Mothers who breastfeed are less likely to develop breast and ovarian cancer, compared to women who feed their babies formula (AAP, 2012; Collaborative Group on Hormonal Factors in Breast Cancer [CGHFBC], 2002; Labbok, 2001; Tung et al., 2005). It is estimated that worldwide, over one million deaths among children under the age of five could be prevented by breastfeeding (Jones et al., 2003).

National breastfeeding rates fall short of the Healthy People 2020 (HP 2020) goals for increasing the proportion of infants who are breastfed (USDHHS, 2010). In 2009, 76.9% of infants were breastfed at some point during their first year of life, 36% were breastfed exclusively three months, and 16.3 % were breastfed exclusively six months (Centers for Disease Control and Prevention, [CDC,], 2012). Kentucky's breastfeeding rates fall below both national averages and HP 2020 goals, with 59.4% breastfeeding at some point during their first year of life, 21.1% breastfeeding exclusively at three months and 9.6% breastfeeding exclusively at six months (CDC, 2012).

The WHO defines exclusive breastfeeding as feeding an infant only breast milk and small amounts of the following fluids: a) oral rehydration solutions (ORS), b) vitamins, c) minerals and d) medicines (WHO, 2008). Predominant breastfeeding includes ORS, vitamins, minerals, medicines, water, water-based drinks, and ritual fluids. Ritual fluids include any fluid given as part of a religious or cultural practice. The WHO definition does not discuss supplementation with formula for medical reasons such as weight loss or hypoglycemia. The WHO definition includes medications, but it is unclear if formula could be considered a medication in these instances. For the purposes of this paper, the WHO definition of exclusive breastfeeding was used and formula supplementation for medical reasons was considered medication.

The purposes of this dissertation were to: a) explore the role of breastfeeding intention, self-efficacy and support on duration of exclusive breastfeeding, and b) describe the common factors among women who breastfed exclusively for at least 16 weeks. Therefore, the specific aims were to:

1. Predict breastfeeding duration in a sample of postpartum women 18-42 years of age within 72 hours (immediate postpartum period) of a vaginal or surgical delivery at a university medical center.

**H<sub>1</sub>:** The higher the score on the Infant Feeding Intentions (IFI) scale, the more likely a mother is to breastfeed exclusively.

**H<sub>2</sub>:** The higher the score on the IFI and the Breastfeeding Self-Efficacy Scale (BSE), the more likely the mother is to breastfeed exclusively for 16 weeks.

**H<sub>3</sub>:** Mothers with a greater degree of social support (as assessed using the Social Support Index [SSI] or the Hughes Breastfeeding Support Scale [HBSS]) will be more likely to breastfeed exclusively for 16 weeks than mothers with less support.

**H<sub>4</sub>:** Mothers with higher comfort with formula feeding will be less likely to breastfeed exclusively for 16 weeks than mothers with lower comfort with formula feeding.

2. Describe the factors mothers used to breastfeed exclusively, for at least 16 weeks, in a sub-sample of mothers from the above population.

The second chapter in this dissertation is a literature review reporting the most commonly used tools for measuring breastfeeding intention. Twenty-eight articles were reviewed to determine the most effective way to measure intention. Measures were broken into the following three categories: 1) question format, 2) Likert scales, and 3) the Infant Feeding Intentions (IFI) scale. The articles are reviewed and an overview of each measure is reported. Based on the results of this literature review, the IFI scale was chosen as the measure of breastfeeding intention for this study.

The third chapter reports and discusses the results from the quantitative portion of this study. This chapter focuses on how breastfeeding intention,

breastfeeding self-efficacy, general support and breastfeeding support impact duration of exclusive breastfeeding. Intention, self-efficacy and support were measured because current research reports that these are the most important modifiable factors affecting breastfeeding duration (Meedy, Fahy, & Kable, (2010). The population above is described in greater detail, and the hypotheses are statistically analyzed and the results reported.

The fourth chapter reports and discusses the results from the qualitative portion of this study. Mothers who breastfed exclusively for 16 weeks took part in focus groups so the principal investigator (PI) could gain a better understanding of the factors that encourage exclusive breastfeeding. The population is described and the data are analyzed. The role of the theory of planned behavior in exclusive breastfeeding is discussed. Common themes voiced by the mothers who breastfed exclusively for 16 weeks are reported.

Finally, the last chapter provides an overview of the main findings from Chapters Two, Three and Four. Study limitations are discussed and recommendations for future research are made. Implications for clinical practice are explored.

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## Chapter Two

### Introduction

Breastfeeding is the gold standard of infant feeding. Multiple organizations recognize the importance of exclusive breastfeeding for the first six months of an infant's life (American Academy of Family Physicians [AAFP], 2008; American Academy of Pediatrics [AAP], 2012; World Health Organization [WHO], 2001). Breastfeeding should be continued, along with the addition of solid foods when the infant is six months of age, for at least 12 months or as long as mutually desired by both the mother and child (AAFP, 2008; AAP, 2012; WHO, 2001). The Healthy People 2020 (HP 2020) goals state that 81.9% of women should initiate breastfeeding, 25.5% should be breastfeeding exclusively at six months, and 34.1% should continue to breastfeed for at least 12 months (US Department of Health and Human Services [USDHHS], 2010). Solid foods are introduced after an infant is six months of age. Therefore, the HP 2020 goal percentage is higher than the exclusive rate at six months because this number includes mothers who feed their babies a combination of breast milk and formula. National initiation rates for 2009 (76.9%) did not reach these standards (CDC, 2012). Current national averages fall below the HP 2020 benchmarks for exclusive rates at six months and for continuation to at least 12 months, which are 16.3% and 25.5%, respectively (USDHHS, 2010). Breastfeeding rates in Kentucky also fall short of the HP 2020 goals. In 2009, 59.4% of mothers in Kentucky initiated breastfeeding and 9.6% were breastfeeding exclusively at six months (CDC, 2012).

## Literature Review

Research shows that intention plays an important role in determining breastfeeding duration (Dennis, 2002; Chezem, Friesen, & Boettcher, 2003). The theory of planned behavior (TPB) postulates that attitudes, subjective norm, and perceived behavioral control influence intention to perform a behavior (Ajzen, 1991). Intention is an indicator of how hard a person is willing to try, or how much effort they are willing to put into performing a behavior (Ajzen, 1991). The probability that a person will actually perform a behavior increases as the strength of intention increases (Fishbein & Ajzen, 1975). Therefore, intention is the antecedent of actual behavior (Ajzen & Madden, 1986). Intention to breastfeed is influenced by a mother's attitude toward breastfeeding, whether she views it as the normal way to feed an infant, and how much control she feels she has over the breastfeeding experience. The stronger a mother's intention to breastfeed exclusively the more likely she should be to actually breastfeed exclusively. Despite the fact that intention seems to play a crucial role in breastfeeding behavior, little is known about the current state of measurement for intention to breastfeed.

Measurement of intention varies widely across the literature. Some authors present participants with a question that can be answered as: a) yes, I intend to breastfeed, b) I intend to feed both breast and human milk substitute, or c) I do not intend to breastfeed (Declercq, Labbok, Sakata, & Hara, 2009; Mitra, Khoury, Hinton, & Carothers, 2004; Perrine, Scanlon, Li, Odom, & Grummer-Strawn, 2012; Stuebe & Bonuck, 2011). Other articles use a Likert scale (Bai,

Middlestadt, Peng, & Fly, 2010; Bai & Wunderlich, 2011; Hill, Arnett, & Mauk, 2008; Wilhelm, Rodehorst, Stepan, Hertzog, & Berens, 2008; Nommsen-Rivers, Chantry, Cohen, & Dewey, 2010; Nommsen-Rivers, Cohen, Chantry & Dewey, 2010; Nommsen-Rivers & Dewey, 2009) to determine the strength of breastfeeding intention. Formatting of the questions and the Likert scales varied according to the author.

The types of scales used to measure breastfeeding intention can be broken down into the following three categories: 1) question format, 2) Likert scale and 3) the IFI scale. Therefore, the purposes of this paper were to: a) provide an overview of the state of measurement of breastfeeding intention, b) analyze the three categories of existing measures of breastfeeding intention, and c) make recommendations pertaining to the future direction of measures of breastfeeding intention.

### **Data Sources and Abstraction**

A literature review was conducted in CINAHL and PubMed using the keywords *breastfeeding* and *intention*. Articles written between the years 2000 and 2013 were eligible for the review. Inclusion criteria were: a) measurement of intention during pregnancy or the postpartum period and b) written in English. Exclusion criteria included: a) high risk pregnancies, b) maternal HIV/AIDS or diabetes, and c) studies focusing on encouraging breastfeeding to prevent allergies/asthma/diabetes. The search yielded 28 articles eligible for review.

This article reviewed the following three categories of measurement for breastfeeding intention: 1) question format, 2) Likert scale, and 3) the Infant

Feeding Intentions (IFI) scale (Nommsen-Rivers & Dewey, 2009). The reliability coefficient for many of the question scales cannot be determined and therefore, are not included. Reliability coefficients are reported when available. Each measure was critiqued and critically analyzed to determine which scales most accurately measure breastfeeding intention. Recommendations for future research concerning the measurement of breastfeeding intention are made. The instruments and studies included in this review are presented in Tables 2.1, 2.2, and 2.3.

## **Review**

The following paragraphs will discuss each of the three categories of measures used for breastfeeding intention. Question format will be discussed first, followed by Likert scales and finally, the IFI scale.

### **Question Format**

Authors used various types of question format scales to determine a mother's intention to breastfeed. Eight studies asked mothers a yes/no type question to determine their intention to breastfeed (Azulay-Chertok, Luo, Culp, & Mullett, 2011; Colaizy, Saftlas, & Morriss, 2012; Kloeblen-Tarver, Thompson, & Miner, 2002; Kuo et al., 2008; Lee, Rubio, Elo, McCollum, & Chung, 2005; McKee, Zayas, & Jankowski, 2004; Tarrant et al., 2010; Wells, Thompson, & Kloeblen-Tarver, 2002). Other studies used a question format to determine intended duration of breastfeeding (Antoniou, Daglas, Iatrakis, Kourounis, & Greatsas, 2005; Baghurst et al., 2007; Bakoula et al., 2007; DiGirolamo,

Thompson, Martorell, Fein, & Grummer-Strawn, 2005; Donath, Amir, & The ALSPAC Study Team, 2003; Perrine, Scanlon, Ruowei, Odom, & Grummer-Strawn, 2012; Persad & Mensinger, 2008; Saunders-Goldson & Edwards, 2004; Stuebe & Bonuck, 2011). The breastfeeding duration measured by each scale ranged from four months up to 24 months. A few of these studies measured both intended duration and intention for exclusive versus combination or formula feeding (DiGirolamo, Thompson, Martorell, Fein, & Grummer-Strawn, 2005; Donath, Amir, & The ALSPAC Study Team, 2003; Perrine, Scanlon, Ruowei, Odom, & Grummer-Strawn, 2012; Stuebe & Bonuck, 2011). Two studies measured intention to breastfeed exclusively, combination feed or formula feed (Declercq, Labbok, Sakata, & O'Hara, 2009; Otsuka, Dennis, Tatsuoka, & Jimba, 2008).

Results reported included the effects of sociodemographic characteristics on intention and whether intention predicted initiation and duration. Maternal age and education were common predictors of intention. Older mothers and mothers with higher levels of education were more likely to intend to breastfeed (Azulay-Chertok, Luo, Culp, & Mullett, 2011; Bakoula et al., 2007; Colaizy, Saftlas, & Morriss, 2012; Kuo et al., 2008; Lee, Rubio, Elo, McCollum, & Chung, 2005; McKee, Zayas, & Jankowski, 2004; Perrine, Scanlon, Ruowei, Odom, & Grummer-Strawn, 2012; Persad & Mensinger, 2008; Saunders-Goldson & Edwards, 2004). Intention predicted initiation in a number of studies (Colaizy, Saftlas, & Morris, 2012; Donath, Amir, & The ALSPAC Study Team, 2003; Kuo et al., 2008). Intention also predicted duration of any breastfeeding and exclusive

breastfeeding (Colaizy, Saftlas, & Morris, 2012; Donath, Amir, & The ALSPAC Study Team, 2003; Kuo et al., 2008; Otsuka, Dennis, Tatsuoka, & Jimba, 2008; Tarrant et al., 2010). Mothers who intended to breastfeed for less than six months weaned their babies earlier than women who intended to breastfeed for at least six months (Baghurst et al., 2007; Bakoula et al., 2007; DiGirolamo, Thompson, Martorell, Fein, & Grummer-Strawn, 2005). Women who planned to combination feed their babies intended to breastfeed for a shorter amount of time than women who intended to breastfeed exclusively (Saunders-Goldson & Edwards, 2004).

The scales reviewed measured breastfeeding intention to varying degrees. Some scales measured intention to initiate breastfeeding, while others measured intention to breastfeed for a specific duration. Still other scales measured both intentions to initiate breastfeeding and to breastfeed for a specific time period. This inconsistency makes comparisons between scales difficult. Additionally, using a single item to measure breastfeeding intention does not allow researchers to report the reliability coefficient of the measure of breastfeeding intention. A number of the studies reported the ability of intention to predict duration of breastfeeding and duration of exclusive breastfeeding (Antoniou, Daglas, Iatrakis, Kourounis, & Greatsas, 2005; Baghurst, Pincombe, Peat, Henderson, Reddin, & Antoniou, 2007; Mitra, Khoury, Hinton, & Carothers, 2004; Otsuka, Dennis, Tatsuoka, & Jimba, 2008). This indicates that the scales are valid. Further testing and analysis would add to the reliability of these scales.

## Likert Scale

Six of the studies reviewed used some type of Likert scale question(s) to measure intention (Bai, Middlestadt, Peng, & Fly, 2010; Bai & Wunderlich, 2011; Hill, Arnett, & Mauk, 2008; Lawton, Ashley, Dawson, Waiblinger, & Conner, 2012; McMillan et al., 2009; Wilhelm, Rodehorst, Stepan, Hertzog, & Berens, 2008). Of these studies, five measured intended duration of breastfeeding (Bai, Middlestadt, Peng, & Fly, 2010; Bai & Wunderlich, 2011; Hill, Arnett, & Mauk, 2008; Lawton, Ashley, Dawson, Waiblinger, & Conner, 2012; Wilhelm, Rodehorst, Stepan, Hertzog, & Berens, 2008). Two of these studies measured intention to breastfeed exclusively (Bai, Middlestadt, Peng, & Fly, 2010; Bai & Wunderlich, 2011). The final study measured strength of intention to breastfeed and classified mothers into intend to breastfeed or do not intend to breastfeed (McMillan et al., 2009).

Demographic factors and strength of breastfeeding intention influenced initiation and duration. Mothers with more years of education were more likely to intend to breastfeed than mothers with less years of education (Lawton, Ashley, Dawson, Waiblinger, & Conner, 2012). These mothers also breastfed their babies for a longer duration than mothers with less education. Intention to breastfeed predicted initiation in a number of studies (Bai, Middlestadt, Peng, & Fly, 2010; Lawton, Ashley, Dawson, Waiblinger, & Conner, 2012). In many of these samples, intention to breastfeed also predicted duration of either exclusive or any breastfeeding (Bai, Middlestadt, Peng, & Fly, 2010; Lawton,

Ashley, Dawson, Waiblinger, & Conner, 2012; McMillan et al., 2009; Wilhelm, Rodehorst, Stepan, Hertzog, & Berens, 2008).

### **Infant Feeding Intentions Scale**

The Infant Feeding Intentions (IFI) scale is a five question Likert scale designed to measure breastfeeding intention (Nommsen-Rivers & Dewey, 2009). Two questions focus on intention to initiate breastfeeding and three questions focus on intended duration of exclusive breastfeeding. Total scale scores can be broken down into very low (0-3.5), low (4.0-7.5), moderate (8.0-11.5), strong (12.0-15.5) and very strong (16.0) intention to breastfeed. Total IFI scale scores increased as planned breastfeeding duration increased (Nommsen-Rivers, Cohen, Chantry, & Dewey, 2010). The IFI scale score also predicted actual duration of exclusive breastfeeding (Nommsen-Rivers & Dewey, 2009). Mothers with higher levels of comfort with formula feeding were less likely to intend to breastfeed than mothers with lower levels of comfort with formula feeding (Nommsen-Rivers, Chantry, Cohen, & Dewey, 2010).

### **Discussion**

Inconsistency in measurement makes it difficult to compare findings across samples and to determine the reliability and validity of the measures. It is clear that intention to breastfeed plays a significant role in actual breastfeeding duration. Consequently, investigators should strive to find the most accurate measure of breastfeeding intention.



In the studies that were reviewed, the time period when breastfeeding intention was measured varied. About 60% of the articles measured breastfeeding intention prenatally, while the remaining articles measured it during the postpartum period. Breastfeeding intention could be influenced by the first few actual breastfeeding experiences after the baby is born. These first few experiences could change a mother's breastfeeding intention. Researchers should determine the most accurate time period to measure breastfeeding intention.

### **Strengths and Weaknesses of Existing Scales**

The questions format scales do not take long for participants to answer because they are usually only one or two questions in length. The major weakness of all the question format scales is the inability to obtain a reliability coefficient. Other types of reliability and validity should be reported. Second, it is difficult to make comparisons across populations when there is inconsistency in measurement. Author devised scales should be constructed when researchers cannot find another reliable and valid scale to measure breastfeeding intention in their population (Streiner & Norman, 2008; Nommsen-Rivers & Dewey, 2009). Even in these circumstances, researchers should test the reliability and validity of existing scale(s) in their sample. Finally, it is difficult to do in-depth data analysis on question format scales because, the strength of a mother's intention cannot be determined using these scales. Therefore, you cannot analyze whether mothers who actually breastfeed as long as they intended had higher breastfeeding intention when compared to mothers who did not breastfeed as

long as they intended. This decreases the strength of the data analysis concerning the ability of intention to predict duration. Intention to breastfeed includes both intentions to initiate breastfeeding and to breastfeed for a specific duration. Scales should measure both intention to initiate breastfeeding and intended duration of exclusive breastfeeding (Nommsen-Rivers & Dewey, 2009).

Likert scales have a number of positive aspects. The Likert scales reviewed were short in length and therefore, took a small amount of time to complete. Likert scales also provide the opportunity to determine strength of intention. Total scale scores can be classified into low, medium and high intention to breastfeed. This allows researchers to compare the predictive ability of varying strengths of breastfeeding intention.

None of the scales in the Likert scale category measured both intentions to initiate breastfeeding and to breastfeed exclusively for six months. Two studies measured intention to breastfeed exclusively for six months (Bai, Middlestadt, Peng, & Fly, 2010; Bai & Wunderlich, 2011). It appears that these studies may have used the same scale. The reliability coefficient of both scales was good (0.99 and 0.94, respectively). Neither article reports the exact questions used to measure intention to breastfeed exclusively for six months. This information would be helpful when determining the usefulness of this scale.

The remaining studies do not measure intention to breastfeed exclusively for six months (Hill, Arnett, & Mauk, 2008; Lawton, Ashley, Dawson, Waiblinger, & Conner; 2012; McMillan et al., 2009; Wilhelm, Rodehorst, Stepan, Hertzog, & Berens, 2008). The scale by Lawton, Ashley, Dawson, Waiblinger, & Conner

(2012) had a Cronbach's alpha of .96 for the three items. The questions have very similar wording that may be difficult for mothers to differentiate among the meanings. The scale used by McMillan et al. (2009) used five questions to measure intention. Mothers were asked to rate the five items on a five point Likert scale. Providing the wording and response options for every question would have added clarity concerning the administration and scoring of this scale. The reliability coefficient was .96. The final study used a one question 7-point Likert scale to measure intended duration up to six months and accurately reported that the reliability coefficient cannot be determined on a single-item scale (Wilhelm, Rodehorst, Stepan, Hertzog, & Berens, 2008). Testing each of these scales in diverse populations would add to their reliability and validity.

The IFI scale is a thorough and accurate measure of breastfeeding intention (Nommsen-Rivers, Cohen, Chantry, & Dewey, 2010; Nommsen-Rivers & Dewey, 2009). It measures both intentions to initiate breastfeeding and to breastfeed exclusively for six months. The scale consists of five items, which are scored on a 0-4 Likert scale. One item is reverse scored. This scale takes approximately five minutes to complete. It shows good reliability and validity across very diverse populations and among both English and Spanish speaking women. Continued testing in other diverse populations will provide more information on the reliability and validity of the scale.

Overall, each of the scales were short and could be completed in 5-10 minutes. The reliability and validity of question format scales cannot be determined. Therefore, this type of scale should be avoided. Likert scales allow

researchers to determine reliability and validity, and should be used in the place of questions format scales. The IFI scale measured both intention to initiate and intention to breastfeed exclusively for six months. This scale allows the researcher to classify intention into very low, low, moderate, strong and very strong intention. These classifications are beneficial when using intention to predict behavior.

Future research should focus on determining which scales are the most reliable and valid measures of breastfeeding intention. Researchers should consider using two scales to measure intention since most of the scales consist of 5 questions or less. Comparing the ability of each scale to measure breastfeeding intention in the same population would provide further insights into each scale's ability to accurately measure breastfeeding intention.

### **Conclusions**

A majority (68%) of the studies reviewed used a question format to measure breastfeeding intention. One reason to avoid the use of this type of measure to determine breastfeeding intention is that the creator of the theory of planned behavior recommends using Likert type scales to measure each of the constructs in the theory (Ajzen, 2002). Second, reliability and validity cannot be evaluated for one item. Although this type of measurement seems appealing because of its ease, authors should strive to avoid this type of measurement for breastfeeding intention.

The five Likert scales with strong reliability coefficients should be tested on diverse populations in order to add to the reliability and validity of each scale. It

would be beneficial to revise the scales to include a measure of duration and exclusivity. Authors should use one or both of these scales along with the IFI when measuring breastfeeding intention. A comparison of the psychometric properties of each scale in a given population should be explored.

Only one scale was tested in multiple populations (Nommsen-Rivers, Cohen, Chantry, & Dewey, 2010; Nommsen-Rivers & Dewey, 2009). Reliability and validity of this scale can be improved by using it consistently across populations with varying research designs. As previously stated, the reliability and validity could be strengthened by comparing it to another scale measuring breastfeeding intention such as the scale developed by Hill, Arnett and Mauk (2008). Nommsen-Rivers, Chantry, Cohen, and Dewey (2010) reported that comfort with formula feeding affected breastfeeding intention more than breastfeeding self-efficacy and comfort with breastfeeding. Researchers should consider measuring comfort with formula feeding along with breastfeeding intention.

This review identified a gap in the measurement of breastfeeding intention. Scales measuring breastfeeding intention should focus on intention to initiate breastfeeding and intention to breastfeed exclusively for at least six months. A number of scales reported strong reliability coefficients. However, further testing should be done in diverse populations and in varied research designs. Authors who are not measuring intention to breastfeed exclusively should consider adding this measure to their scales. Maternal intention to breastfeed often predicts initiation and/or duration of breastfeeding. Therefore,

researchers should continue to test the reliability and validity of different scales to determine the most accurate measures of breastfeeding intention.

Future research should focus on interventions that increase intention to breastfeed exclusively for six months. Practitioners should provide education and support to foster intention to breastfeed. These actions could increase the proportion of mothers who breastfeed exclusively for the first six months of their infants lives.

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Table 2.1

*Comparison of Measures for Breastfeeding Intention: Question format*

Author (Year, Country)	Sample	Time of Measure	Measurement of Intention
Antoniou, Daglas, Iatrakis, Kourounis, Greatsas (2005, Greece)	Postpartum mothers (n = 911)	Postpartum	How long do you intend to breastfeed: 5-10 days, 10-30 days, 1-2 months, 2-4 months, 4-6 months, 6-12 months, 12-24 months?
Azulay-Chertok, Luo, Culp, & Mullett. (2011, USA).	Secondary data analysis of West Virginia birth certificates and West Virginia Birth Score (n = 52, 899)	Postpartum	Health Care Provider to check either breast only or bottle/both
Baghurst, Pincombe, Peat, Henderson, Reddin, & Antoniou (2007, Australia)	Pregnant women (n = 317)	Prenatally  Duration at 6 weeks, 3 months, and 6 months.	How long do you intend to breastfeed: less than 2 months, 2-5 months, 6 months or more?
Bakoula, Veltsista, Prezerakou, Moustaki, Fretzayas & Nicolaidou (2007, Greece)	Postpartum mothers (n = 3734)	Postpartum  Duration between 8-12 months postpartum.	A question: 1) no, 2) as much as I can, 3) I don't know, 4) 1 month, 5) 1-3 months, 6) 3-6 months, and 7) 6 months or more.  Responses dichotomized into positive intention (responses 2, 6, 7) and negative intention (responses 1, 3, 4, 5)
Colaizy, Saftlas, & Morriss. (2012, USA).	Mothers who completed Pregnancy Risk Assessment Monitoring System questionnaire (n = 16, 839)	Postpartum	During your most recent pregnancy, what did you think about breastfeeding your new infant? I knew I would breastfeed (definite intention), I thought I might breastfeed (tentative intention), I knew I would not breastfeed (no intention), and I didn't know what to do about breastfeeding (uncertain).
Declercq, Labbok, Sakata, & O' Hara. (2009, USA).	Postpartum mothers (n = 1573)	Retrospective  Infant feeding at 1 week  Potential predictors of breastfeeding intention: 7 hospital practices	As you came to the end of your pregnancy, how had you hoped to feed your baby? (breastfeeding alone, formula only, a combination of breastfeeding and formula)
DiGirolamo, Thompson, Martorell, Fein, & Grummer-Strawn. (2005, USA).	Secondary analysis of data from the 1993/1994 Infant Feeding Practices Survey (n = 1, 665)	Prenatal questionnaire  Neonatal questionnaire - 10 weeks postpartum	Planned method of feeding (breast milk, formula, or don't know yet)  Duration (never, ≤ 2 months, 3-4 months, 5-6 months, 7-9 months, 10-12 months, >12 months)

Table 2.1 (continued)

Author (Year, Country)	Sample	Time of Measure	Measurement of Intention
Donath, Amir, & The ALSPAC Study Team (2003, United Kingdom)	Women who were part of the ALSPAC study (n = 10,548)	Prenatally  Duration at 6 months postpartum.	3 questions about intention for: 1) the first week, 2) the rest of the first month, 3) months 2-4.  Response options were: breastfeed, breast & bottle, bottle feed or uncertain.  Duration was obtained by asking if the infant had ever been breastfed and if so, the age of the baby when breastfeeding was stopped.
Kloelben-Tarver, Thompson, Miner. (2002, USA).	Pregnant women (n = 367 primiparas; 596 multiparas)	Prenatally	Not planning to breastfeed versus planning to breastfeed
Kuo, Hsu, Li, Lin, Chen, Gau, & Chou (2008, Taiwan)	Postpartum mothers (n = 12, 201)	Postpartum  Duration at 1, 4 and 6 months postpartum.	Yes/no  During follow-up breastfeeding was categorized into exclusive and partial using the question: How are you feeding your infant?
Lee, Rubio, Elo, McCollum, & Chung. (2005, USA).	Pregnant women (n= 2,690)	Prenatally	Do you plan on breastfeeding your infant? (Intending on breastfeeding vs. don't know/do not intend to breastfeed)
McKee, Zayas, & Jankowski. (2004, USA).	Pregnant minority women (n = 174)	Prenatally	Intend to breastfeed vs. bottle feed
Mitra, Khoury, Hinton, & Carothers. (2004, USA).	Pregnant women (n = 687)	Prenatally	Intended to breastfeed (exclusive or mixed) vs. did not intend to breastfeed
Otsuka, Dennis, Tatsuoka, & Jimba (2008, Japan)	Postpartum mothers (n = 262)	Postpartum  Infant feeding method at 4 weeks postpartum.	Intention to breastfeed exclusively or combination of breast milk and formula.
Perrine, Scanlon, Ruowei, Odom, & Grummer-Strawn. (2012, USA).	Secondary analysis of the Infant Feeding Practices Survey II (n = 3,006 at baseline; n = 1, 457 for duration analysis)	Prenatal and postpartum questionnaire	What method do you plan to use to feed your baby in the first few weeks of life? (breastfeed only; formula-feed only; both breast and formula feed, or don't know yet)  How old do you think your baby will be when you first feed him or her formula or any other food besides breast milk? (<1 mo., 1-2 mos., 3-4 mos., 5-6 mos., ≥ 7 mos.)



Table 2.1 (continued)

Author (Year, Country)	Sample	Time of Measure	Measurement of Intention
Persad & Mensinger. (2008, USA).	Pregnant women (n = 100)	Prenatally	Intend to breastfeed, unsure, and do not intend to breastfeed  Some measurement of intended duration
Saunders-Goldson, & Edwards. (2004, USA).	Pregnant African American Women (n = 95)	Prenatally	Yes/No  Planned duration and proportion of liquid feeding by breast milk at 1, 3, and 6 months
Stuebe & Bonuck (2011, USA)	Pregnant women (n = 883)	Prenatally	Mothers reported breastfeed/no formula, just formula/no breastfeeding, both breast and formula feed, or unsure.  Mothers were asked how old they thought their baby would be when first fed formula or baby food (<1, 1-2, 3-4, 5-6, 7-9 or > 9 months).
Tarrant, Younger, Sheridan-Pereira, White & Kearney (2010, Ireland)	Pregnant women (n = 450)	Antenatally  Duration at 7 days, 6 weeks and 6 months postpartum	Yes/no

Note. ALSPAC = Avon Longitudinal Study of Pregnancy and Childhood; EBF = exclusively breastfeed

Table 2.2

*Comparison of Measures for Breastfeeding Intention: Likert scales*

Author (Year, Country)	Sample	Time of Measure	Measurement of Intention	Cronbach's Alpha
Bai, Middlestadt, Peng, & Fly. (2010, USA).	Postpartum mothers (n= 78)	Postpartum	Rate likelihood of EBF for 6 months (1= extremely unlikely- 7= extremely likely)	For intention, attitude, SN, and PBC were 0.99, 0.84, 0.60, 0.90, respectively
Bai & Wunderlich. (2011, USA).	Postpartum mothers (n = 236)	Postpartum	A two-item Likert-scale to rate intention to EBF for 6 months (1 = extremely unlikely; 4 = neither; 7 = extremely likely)	For intention, attitude, SN and PBC were 0.94, 0.90, 0.65 and 0.84, respectively
Hill, Arnett, & Mauk. (2008, USA).	Pregnant and postpartum women (n = 88)	Labor or postpartum	3-point Likert scale (After I have my baby, I plan to breastfeed; I plan to breastfeed for at least 6 months; I plan to breastfeed for longer than 6 months)	The intention scale had a reliability coefficient of 0.88  Factor loading indicates the intention scale is internally consistent (scores range from 0.89-0.70)
Lawton, Ashley, Dawson, Waiblinger & Conner (2012, United Kingdom)	Pregnant women taking part in the Born in Bradford 1000 cohort study. (n = 184)	Prenatally	I intend to breastfeed my baby for the first six months and I want to breastfeed my baby for the first six months (1= 'definitely do' through 5= 'definitely do not')	For the three items was .96
McMillan, Conner, Green, Dyson, Renfrew, & Woolridge (2009, United Kingdom)	Pregnant women (n = 286)	Prenatally  Duration at 10 days and 6 weeks.	I will try to breastfeed my baby for the first six months (1= 'definitely will' through 5= 'definitely will not')  5 items about how they: intended to feed their baby, how strongly they wanted to breastfeed, how likely they thought it was that they would breastfeed, how committed they were to breastfeeding, and how determined they were to breastfeed (1-5 response options)  Another measure of intention categorized mothers into do not intend to breastfeed and intend to breastfeed	For the 5 items was .96

Table 2.2 (continued)

Author (Year, Country)	Sample	Time of Measure	Measurement of Intention	Cronbach's Alpha
Wilhelm, Rodehorst, Stepans, Hertzog, & Berens. (2008, USA).	Postpartum mothers (n = 53)	Postpartum  Days of breastfeeding at 6 months	To what degree do you intend to breastfeed for 6 months? (1 = unlikely to 7 = extremely likely)	Reliability and validity of a single item scale cannot be determined

Note. EBF = exclusively breastfeed; SN = Subjective Norm; PBC = Perceived behavioral control

Table 2.3

*Comparison of Measures for Breastfeeding Intention: Infant Feeding Intentions Scale*

Author (Year, Country)	Sample	Time of Measure	Measurement of Intention	Cronbach's Alpha
Nommsen-Rivers, Chantry, Cohen, & Dewey. (2010, USA).	Secondary analysis among multi-ethnic group of pregnant women (n = 532)	Prenatally	5 Likert scale questions (2 about strength to initiate; 3 strength related to duration)	See Below
Nommsen-Rivers, Cohen, Chantry, & Dewey. (2010, USA).	Pregnant women (n = 532)	Prenatally	5 Likert scale questions (2 about strength to initiate; 3 strength related to duration)	Principle component analysis and factor analysis determined 2 factors: 2 questions initiation (range 0.7-0.85), and 3 questions continuation (range 0.9-0.93) across all ethnic groups  Inter-item correlation for continuation factor: all 3 items positively contributed to alpha
Nommsen-Rivers, & Dewey. (2009, USA).	Pilot: Pregnant women (n = 88 baseline; n = 65 follow-up)  Cohort: Postpartum women (n = 170)	Pilot: Prenatally  Infant feeding between 4-6 weeks postpartum  Cohort: Postpartum, follow-up at 4 days, 6 weeks, and 6 months	5 Likert scale questions (2 about strength to initiate; 3 strength related to duration)  Intended feeding method (breast, formula, both, undecided)	Pilot: 0.9  Item-total correlations: 0.7, 0.76, 0.83, 0.8, 0.67 (items 1-5)  Cohort: 0.9  Item-total correlations: 0.76, 0.54, 0.84, 0.83, 0.77 (items 1-5)

## Chapter Three

### Introduction

The nutritional and immunological benefits of breast milk for infants and children far exceed those of formula. Breastfeeding is extremely beneficial for mothers as well. Women who breastfeed their babies are less likely to develop breast cancer and Type 2 diabetes than women who do not breastfeed. It is for these reasons that multiple organizations encourage mothers to breastfeed exclusively for the first six months of an infant's life (American Academy of Family Physicians [AAFP], 2008; American Academy of Pediatrics [AAP], 2012; World Health Organization [WHO], 2001). Healthy People 2020 goals include having 81.9% of infants breastfeeding at any point during the first year of life and 25.5% breastfeeding exclusively for six months (U.S. Department of Health and Human Services [USDHHS], 2010). Exclusive breastfeeding rates at six months nationally (16.3%) and in Kentucky (9.6%) fall short of the Healthy People 2020 goals (Centers for Disease Control and Prevention, CDC, 2012). A better understanding of the factors that encourage breastfeeding among women in Kentucky is necessary to increase exclusive breastfeeding rates.

The purpose of this study was to explore the role of breastfeeding intention, self-efficacy, and support on duration of exclusive breastfeeding. The specific aim was to:

1. Predict duration, in a sample of postpartum women 18-42 years of age within 72 hours (immediate postpartum period) of a vaginal or surgical delivery at a university medical center.

**H<sub>1</sub>:** The higher the score on the Infant Feeding Intentions scale (IFI), the more likely a mother is to breastfeed exclusively.

**H<sub>2</sub>:** The higher the score on the IFI and the Breastfeeding Self-Efficacy scale (BSE), the more likely the mother is to breastfeed exclusively for 16 weeks.

**H<sub>3</sub>:** Mothers with a greater degree of social support (as assessed using the Social Support Index [SSI] or the Hughes Breastfeeding Support Scale [HBSS]) will be more likely to breastfeed exclusively for 16 weeks than mothers with less support.

**H<sub>4</sub>:** Mothers with higher comfort with formula feeding will be less likely to breastfeed exclusively for 16 weeks than mothers with lower comfort with formula feeding.

### **Conceptual Definition of Exclusive Breastfeeding**

Labbok and Krasovec (1990) reported a simple, research based framework to define the method of infant feeding at a single time point. The classifications were based on research that indicated that the benefits of breast milk are dose dependent. Therefore, it is important to determine the amount of breast milk an infant has received. Exclusive breastfeeding was defined as no other liquid or solid food being given to the infant. An infant would be considered as almost exclusive if they received breast milk and vitamins, minerals, water, juice or small amounts of ritualistic feedings along with breast milk. The category of full breastfeeding included infants who were either exclusively or almost exclusively breastfeeding. Infants who were receiving breast milk and non-human

milk were classified as partially breastfed. Partial breastfeeding was further classified into low, medium and high categories. Infants who were classified as low partial breastfeeding were receiving the least amount of breast milk. The World Health Organization (WHO, 2008) used Lobbok and Krasovec' s definitions to measure feeding method with one small change. Instead of “exclusive” and “almost exclusive”, the WHO used the wording “exclusive” and “predominant” to define full breastfeeding. According to the WHO definition, exclusive breastfeeding can include oral rehydration solutions, vitamins, minerals and medicines (WHO, 2008). Predominant breastfeeding includes ORS, vitamins, minerals, medicines, water, water-based drinks, and ritualistic fluids. Neither definition handles supplementation with formula for medical reasons such as weight loss or hypoglycemia. The WHO definition includes medications, but it is unclear if formula could be considered a medication in these instances. For the purposes of this paper, formula supplementation for medical reasons was considered a medication because pediatricians recommend formula supplementation as a treatment for a number of medical issues in the immediate postpartum period. Physicians recommend supplementation when an infant has hyperbilirubinemia, hypoglycemia and poor weight gain. Lactation consultants also use formula as a way to encourage and teach an infant to breastfeed effectively. It is because of this that formula supplementation for medical reasons was defined as a medication for this dissertation.

## Literature Review

Both non-modifiable and modifiable factors influence breastfeeding initiation and duration. It has been well established that maternal age, race, marital status, education and socioeconomic status impact breastfeeding duration (Meedya, Fahy, & Kable, 2010; Thulier & Mercer, 2009); however, these factors are either not modifiable or difficult to modify. A better understanding of the modifiable factors that impact breastfeeding duration could improve breastfeeding rates both nationally and in Kentucky. A literature review by Meedya, Fahy, and Kable (2010) reported that breastfeeding intention, breastfeeding self-efficacy, and social support were three modifiable factors associated with breastfeeding duration to six months. Thulier and Mercer (2009) also published a literature review outlining the modifiable variables that impact breastfeeding duration. They reported that breastfeeding intention, breastfeeding self-efficacy and support influence breastfeeding duration. Other literature support these findings and are discussed in the following paragraphs.

Intention, self-efficacy, and support have been measured in a number of studies to predict breastfeeding duration. Intention predicted breastfeeding duration in multiple studies (Bai, Middlestadt, Peng, & Fly, 2010; Bosnjak, Gruguric, Stanojevic, & Sonicki, 2009; Forster, McLachlan, & Lumley, 2006; Kronborg & Vaeth, 2004; O'Brien, Buikstra, & Hegney, 2008; Semenic, Loiselle, & Gottlieb, 2008; Whaley, Meehan, Lange, Slusser, & Jenks, 2002; Wilhelm, Rodehorst, Stephans, Hertzog, & Berens, 2008). Breastfeeding self-efficacy also predicted breastfeeding duration in a number of studies (Bailey, Clark, &



Shepherd, 2008; Kronborg & Vaeth, 2004; McQueen, Dennis, Stremmler, & Norman, 2011; O'Brien, Buikstra, & Hegney, 2008; Pollard & Guill, 2009; Semenic, Loisel, & Gottlieb, 2008; Wilhelm, Rodehorst, Stephans, Hertzog, & Berens, 2008). The ability of support to predict duration is more complex because it can present in many forms. Family and friends can be instrumental in helping mothers breastfeed exclusively (Bosnjak, Grguric, Stanojevic, & Sonicki, 2009; Cernadas, Noceda, Barrera, Martinez, & Garsd, 2003). Support can be given by health care providers through education and practical advice. It appears that women may need to receive support throughout pregnancy and the postpartum period for support to positively influence breastfeeding duration (Gill, Reifsnider, & Lucke, 2007; Hannula, Kaunonen, & Tarkka, 2008; Demirtas, 2012). Ongoing face-to-face support by a peer, lactation consultant or health care provider is another effective strategy for increasing breastfeeding duration (Balkam, Cadwell, & Fein, 2011; Gill, Reifsnider, & Lucke, 2007; Renfrew, McCormick, Wade, Quinn, & Dowswell, 2012). The ability to pump at work also increases breastfeeding duration (Whaley, Meehan, Lange, Slusser, & Jenks, 2002).

Comfort with formula feeding was the strongest predictor of intention when compared to comfort with breastfeeding and breastfeeding self-efficacy. Mothers with lower levels of comfort with formula feeding were approximately 30 times more likely to intend to initiate breastfeeding and to breastfeed for longer periods of time when compared to mothers who had higher levels of comfort with formula feeding (Nommsen-Rivers, Chantry, Cohen, & Dewey, 2010).

Based on the literature above, this article will focus on the roles of breastfeeding intention, breastfeeding self-efficacy and social support in breastfeeding duration among women who gave birth at a university medical center.

## **Methods**

Cross-sectional, quantitative data were collected prior to discharge from a university birthing center and at 2, 4, 8, 12, and 16 weeks. Mothers were followed for 16 weeks, or until they weaned their babies. The nursing systems improvement facilitator at the university hospital was contacted in order to comply with the hospital's research regulations. The study received approval from the university's medical internal review board prior to data collection.

Inclusion criteria for the mothers were: a) 18 years of age or older, b) English speaking, c) gave birth to an infant who was at least 37 weeks gestation, and d) were feeding their baby at least some breast milk. Exclusion criteria included the following: a) mothers of multiples, b) infants with birth defects or chronic illnesses, and c) mothers with chronic illnesses such as, diabetes, heart disease, and HIV/AIDS. These exclusion criteria were established in order to decrease any confounding variables that may impact breastfeeding initiation or duration.

Women of all ages, races and ethnicities were included in this research project. After power analysis, it was determined that 84 was a reasonable number of women to recruit for this study. This number took into consideration a 20% drop-out rate. The principal investigator (PI) discussed whether a mother

should be approached regarding participation in the study with the lactation consultants (LCs) and staff nurses at the university birthing center. Once a patient was identified as a possible participant, the PI conducted a brief interview with her to determine eligibility. If she was not eligible, the PI discussed this with her. If she was eligible, the study was described and consent was obtained. Mothers were informed that they could withdraw from the study at any time. All flyers, forms and questionnaires were written in English at the sixth grade level.

After consent was obtained, data were collected in the immediate postpartum period (24-72 hours post-delivery). Data were also collected by telephone or email after discharge from the hospital at 2, 4, 8, 12 and 16 weeks postpartum. All data were entered into a secure, on-line data collection server. The following paragraphs describe the data that were collected during the study. Table 3.1 provides a more succinct view of the study design.

*Demographic data* such as contact info, age, education, marital status, WIC participation, household income, and race were measured in the immediate postpartum period.

*Social support* was measured at baseline using the Social Support Inventory (SSI; Timmerman, Emanuels-Zuurveen, & Emmelkamp, 2000). The SSI is a 20-item scale with Likert response options. Respondents were asked to identify the individual who gave them the most support and answer the questions with that person in mind. One such question asks if that individual “offers you help under special circumstances like illness, moving or babysitting”. Response options

ranged from 1 (“much too much support”) through 5 (“much too little support”). “Enough support” was the middle response option and indicated adequate support. “Much too much support” and “much too little support” were combined and “too much support” and “too little support” were combined to result in the following three scoring categories: 1) much dissatisfaction with support, 2) dissatisfaction with support and 3) satisfaction with support. The scale can be broken into four subscales (informative support, instrumental support, social companionship scale, esteem support) and Cronbach alpha's for each subscale ranged from 0.70-0.86 (Timmerman, Emanuels-Zuurveen, & Emmelkamp, 2000). A total score can be determined by adding the ratings for each of the items. The total score was used in this dissertation; Cronbach's alpha for this sample was 0.95.

The Hughes Breastfeeding Support Scale (HBSS; Hughes, 1984) was used to measure social support at four and 16 weeks. It consisted of 30 questions that focused on the types of support a mother was receiving such as, reassuring her that she was taking good care of her baby, doing her grocery shopping, and providing her with information about how to care for her baby. Mothers could respond in the following four ways: 1) no help at all, 2) a small amount of help, 3) a moderate amount of help, and 4) as much help as I wanted. Alpha coefficients were reported for each of the three subscales (emotional support, instrumental support, informational support) and ranged from 0.83-0.88 (Hughes, 1984). A total scale score is obtained by adding the ratings for each of the items. The total

score was used for data analysis in this study; Cronbach's alpha was 0.96 for the participants in this study.

*Intention* was measured using the Infant Feeding Intentions (IFI) scale (Nommsen-Rivers & Dewey, 2009). This scale was administered 24-72 hours after delivery. The IFI scale is a 5-item Likert scale. Two questions addressed breastfeeding initiation and three questions addressed breastfeeding duration. Participants could respond as “very much agree” (1) through “very much disagree” (5). Items were scored 0-4, and one item was reverse scored. The first two items addressed intention to initiate breastfeeding and the last three items addressed intended duration of exclusive breastfeeding. Cronbach's alpha was 0.9 in two separate samples used to develop the scale (Nommsen-Rivers & Dewey, 2009). The authors rated strength of intention based on the total scale score as follows: a) very low (0-3.5), b) low (4.0-7.5), c) moderate (8.0-11.5), d) strong (12.0-15.5), and e) very strong (16.0). Cronbach's alpha for the mothers in this study was 0.63.

*Breastfeeding self-efficacy* was measured using the Breastfeeding Self-Efficacy- Short-Form (BSES-SF) within 72 hours of delivery, at four weeks and at 16 weeks (Dennis, 2003). Each of the 14 items were preceded by the phrase “I can always”. Questions covered topics such as, determining that the baby is getting enough milk and the ability to keep wanting to breastfeed. Responses were on a 5-point Likert scale that ranged from 1 indicating “not at all confident” through 5 meaning “always confident”. Higher scores indicated higher breastfeeding self-efficacy. Cronbach's alpha for the short-form has been

reported as 0.96 (Dennis, 2003); for the current study, the internal consistency was 0.89.

*Comfort with formula feeding and comfort with breastfeeding* were measured in the three days following delivery. They were measured in this study because of findings reported by the developers of the IFI scale (Nommsen-Rivers, Chantry, Cohen, & Dewey, 2010). Participants were asked how comfortable they felt feeding their baby formula or breast milk. They could respond in one of the following ways: 1) very uncomfortable, 2) somewhat uncomfortable, 3) somewhat comfortable, and 4) very comfortable. A higher score indicated a higher level of comfort with formula feeding or breastfeeding, depending upon which scale was administered.

*Postpartum data* included: did the baby sleep in the room with the mother, was the baby supplemented in the hospital or at home, did the baby use a pacifier in the hospital, does the baby use a pacifier now, timing of weaning, reasons for weaning, support, and planned return to work and/or school.

All participants were compensated for their time. Mothers who did not participate in the focus groups were mailed a gift card at 16 weeks, or when they weaned their baby. Focus group participants were given their gift card at the end of the session. Results of the focus groups are discussed in Chapter Four.

## **Data Analysis**

Descriptive analysis, including means, standard deviations and frequency distributions were used to summarize the data. Bivariate analyses were used to determine which factors predicted exclusive breastfeeding at 16 weeks

postpartum. For discrete variables such as age categories, marital status, WIC participation, ethnicity and education a Chi-square or Fisher's exact test (when cell sizes were fewer than 5) were used for comparison between women breastfeeding exclusively at 16 weeks versus not breastfeeding exclusively at 16 weeks. For continuous variables a two sample t-test was used for comparison. Normality was evaluated using the Shapiro Wilk test. If normality was violated the p-values from the t-test were compared with the non-parametric analog of the Wilcoxon Rank Sum test. Spearman correlation was used to measure the association between the level of comfort with formula feeding and the impacted intention to breastfeed. Multivariate logistic regression was used to model the probability of exclusive breastfeeding at 16 weeks based on the total IFI score adjusting for various covariates.

Path analysis models were used to test the direct and indirect effects of IFI on exclusive breastfeeding with the potential mediators of self-efficacy or social support. Multiple logistic and linear regressions were used to determine the path coefficients and corresponding standardized beta weights for these models. Data were analyzed using IBM SPSS version 20, and SAS version 9.3 (SAS Institute, Cary, NC). Values of  $p < .05$  were considered statistically significant.

## Results

At baseline, a majority of the mothers (60%) were between 25-34 years of age ( $29.2 \pm 4.9$ ), were married or co-habiting (91%), and had completed college or some graduate work (74%). A majority of the mothers were Caucasian (70%) followed by African-American (11%). The remaining participants classified

themselves as Hispanic, Asian or other. A majority of the participants had incomes above fifty-thousand dollars per year and subsequently did not participate in WIC. Thirty-eight (45%) participants were primiparous. Demographic data are outlined in Table 3.2.

Total intention scores were tallied and mothers were rated as having very low (0-3.5), low (4.0-7.5), moderate (8.0-11.5), or strong (12.0-15.5) intention to breastfeed. The highest IFI score was 14.5, so none of the mothers were classified as very strong (16.0) intention to breastfeed. One mother (1%) scored in the very low category, 12 mothers (14%) scored in the low category, 17 mothers (20%) scored in the moderate category and 54 mothers (64%) scored in the strong category.

Sixteen women (19%) were supplementing their babies with formula in the immediate postpartum period. Of those women, six did so for medical reasons. Three mothers continued to supplement their babies after it was no longer medically necessary. The reasons these mothers continued to supplement with formula were unclear. Two mothers were using the supplementation to encourage latching onto the breast. This supplementation continued throughout the hospital stay.

Three mothers were lost to follow-up. Two of these mothers were unable to be reached after the baseline interview. One mother was unable to be reached at 4, 8, and 12 weeks, so her data are missing for these time periods. All three of these mothers were supplementing in the hospital. Seven mothers weaned their babies by the two week follow-up. Dyads were no longer followed after the baby



was weaned, so the sample size naturally declined over time. Another five mothers had weaned their babies by the four week follow-up phone call. By eight weeks five more mothers had weaned their babies, and at the 12 week follow-up, seven mothers had weaned their babies. Therefore, 56 women were followed the entire 16 weeks.

Overall, mothers who breastfed exclusively for 16 weeks were older, married, and more educated than mothers who did not. They were also less likely to participate in WIC when compared to mothers who did not breastfeed exclusively for 16 weeks. Baseline IFI scores for mothers who breastfed exclusively for 16 weeks were significantly higher than mothers who did not ( $p < .001$ ). Breastfeeding self-efficacy scores at four ( $p < .002$ ) and 16 weeks ( $p < .006$ ) were significantly higher among the mothers who breastfed exclusively for 16 weeks. Neither general support nor breastfeeding support were significant determinants of exclusive breastfeeding at 16 weeks. Results of the bivariate analyses are presented in Table 3.3.

Higher IFI scale scores predicted breastfeeding status at 16 weeks. After adjusting for age, marital status, WIC participation, education and race, for every one unit increase in the IFI scale score, a mother was at 35% higher odds of breastfeeding exclusively at 16 weeks than a mother with a lower score. The results pertaining to the predictive ability of intention are contained in Table 3.4.

Tests of mediation were run to see if baseline breastfeeding self-efficacy, week four breastfeeding self-efficacy (BSE) and social support were mediators of intention. Neither baseline self-efficacy nor social support had a mediating effect

on intention's ability to predict exclusivity. Breastfeeding self-efficacy measured at 4 weeks postpartum had a partial mediating effect because the p-value for the model with both IFI and week four BSE was significant ( $p = .03$ ), but less significant than the model with IFI alone ( $p = .004$ ). There is also a difference in the standardized beta for IFI alone predicting exclusivity (0.62) and IFI predicting exclusivity with four week BSE included in the model (0.49). The results of tests of mediation are shown in Table 3.5.

Neither logistic regressions for general social support at baseline nor postpartum breastfeeding support were significant. Level of comfort with formula feeding did impact intention and exclusivity. Mothers with higher levels of intention to breastfeed had lower levels of comfort with formula feeding ( $p < .001$ ). Consistent with this finding, the Spearman Correlation Coefficient between intention and comfort with formula feeding was -0.44. This indicates a moderate negative effect. The mean comfort with formula score was lower among mothers who were breastfeeding exclusively at 16 weeks (2.1), compared to mothers who were not breastfeeding exclusively (2.9) at 16 weeks ( $p = .0005$ ). Mothers who were breastfeeding exclusively at 16 weeks had significantly lower comfort with formula scores compared to mothers who were not breastfeeding exclusively at 16 weeks.

## Discussion

Bivariate analysis examining the factors that encouraged exclusive breastfeeding among women who breastfed exclusively for 16 weeks when compared to women who did not revealed similar results to those reported

elsewhere in the literature (Declercq, Labbok, Sakata, & O' Hara, 2009; Tarrant, Younger, Sheridan-Pereira, White, & Kearney, 2010).

Baseline intention and breastfeeding self-efficacy at four weeks postpartum predicted exclusive breastfeeding in this sample. Mothers with higher intention scores were more likely to be breastfeeding exclusively at 16 weeks. This further supports the existing data that intention to breastfeed predicts breastfeeding initiation and duration. Baseline breastfeeding self-efficacy did not predict exclusivity at 16 weeks, but self-efficacy at four weeks did predict exclusivity. Mothers with higher intention to breastfeed and higher breastfeeding self-efficacy at four weeks were more likely to be breastfeeding exclusively at 16 weeks. In the context of predicting modifiable behaviors, self-efficacy is very similar to perceived behavioral control. Ajzen & Madden (1986) stated that self-efficacy was part of perceived behavioral control. Therefore, self-efficacy is one of the pieces that can be used to measure perceived behavioral control.

As previously discussed, social support was not a significant predictor of exclusivity in this sample. Conversely, support from various sources such as lactation consultants, experienced peers and the Internet was invaluable to participants in the focus group. The results from the focus groups made up of women who breastfed exclusively for 16 weeks are reported in Chapter Four.

Comfort with formula influences breastfeeding intention. An inverse relationship between breastfeeding intention and comfort with formula existed in these data. Women with higher levels of comfort with formula were less likely to

be breastfeeding exclusively at 16 weeks compared to women with lower comfort with formula scores.

A mother's understanding of exclusive breastfeeding can vary greatly. The focus group findings, which are discussed in Chapter Four, revealed that some mothers supplemented on a few occasions and still considered themselves as breastfeeding exclusively. This makes comparisons difficult. The questionnaires used in this study asked if the mother was feeding the baby only breast milk, a combination of breast milk and formula or only formula. Many infants are supplemented with formula in the first few weeks of life. The Breastfeeding Committee for Canada (2004) has a classification called total breastfeeding. This classification means that the infant has been breastfed exclusively for the past seven days, but not necessarily prior to that. This definition may be beneficial for infants who received formula supplementation in the first few weeks of life. Noel-Weiss, Boersma and Kujawa-Myles (2012) recommend that both the amount of breast milk received and the method by which it was fed (breast versus bottle) should be considered when reporting on type of breastfeeding. The muscles used to drink from the breast are different from those used to drink from a bottle. The experience of feeding at the breast is also different from the experience of feeding from a bottle. There are so many factors that go into measuring feeding methods that it may be beneficial to classify feeding methods in more than one way. Researchers may need to classify feeding methods at specific points in time and the overall pattern of feeding. Since the importance of breastfeeding is evident, researchers should focus on determining the best way to consistently

measure breastfeeding method. This will allow scientists to more accurately compare results.

In this study, breastfeeding intention was measured during the first 24-72 hours after birth. This could be a limitation. Breastfeeding intention has been measured both prenatally and during the postpartum period in other literature (Nommsen-Rivers, Cohen, Chantry & Dewey, 2010; Persad, & Mensinger, 2008; Bai, & Wunderlich. 2011; Wilhelm, Rodehorst, Stephans, Hertzog, & Berens, 2008). The IFI scale has been administered in both the prenatal and the postpartum period. The wording of the first two questions asks if the mother plans to feed in a specific way. The word “plans” could be interpreted as asking if you will take part in the behavior in the future or as asking if you will continue to partake in a behavior over the course of time. Further analysis is necessary to determine if the first two questions influenced the total IFI scores in this population, or if there is a more appropriate word choice for the postpartum period. Variations in the time period of measurement make comparisons difficult. When breastfeeding intention is measured during the postpartum period, the first few breastfeeding experiences may influence a mother’s breastfeeding intention. It is possible that positive breastfeeding experiences increased breastfeeding intention and negative breastfeeding experiences decreased intention. Sufficient data were not collected to make a determination for this sample. Since these first few experience may impact breastfeeding intention, it may be most accurate to measure intention both prenatally and postnatally. Literature shows that the first two weeks are an important time in determining whether a mother continues to

breastfeed her baby exclusively (Wilhelm, Rodehorst, Stephans, Hertzog, & Berens, 2008). The effects of those first few positive and negative breastfeeding experiences on a mother's actual behavior should continue to be researched. Therefore, the most accurate time to measure breastfeeding intention should continue to be explored.

The literature reports that support is an important factor in a mother's ability to breastfeed her baby exclusively. Mothers who received support from a health care professional had better breastfeeding behaviors (Kervin, Kemp, & Pulver, 2010). Support was not a significant predictor of exclusivity in this study. The scale used to measure social support could be confusing for participants because the response options were: 1) much too little support, 2) too little support, 3) enough support, 4) too much support, and 5) much too much support. Participants may have been confused by enough being the middle response option. There were a number of occasions where the PI had to explain to the participant that enough meant they were getting exactly the amount of support they wanted and needed. Scoring of the scale was also complex. It was difficult to determine if much too much support or much too little support were seen as a negative or positive quality in the eyes of the participant. The author of the scale combined much too much and much too little into one scoring category and too much and too little were also combined into a scoring category. This resulted in the following three scoring categories: 1) much dissatisfaction with support, 2) dissatisfaction with support and 3) satisfaction with support. These factors may have contributed to social support not being significant in these data, but very

important for the participants in the focus groups. The SSI asked participants to respond based on the person who gave them the most support. The results may have been different if general support had been measured instead of the support from one person. It is unclear why breastfeeding support, as measured by the Hughes Breastfeeding Support Scale, was not a significant factor in determining exclusivity. In the future, other scales should be considered as more reliable measures of support.

Comparisons of exclusive and partial breastfeeding rates in this population to state and/or national averages cannot be made, because infants who were formula fed from birth were ineligible at baseline. Therefore, percentages for this sample do not include infants who were formula fed exclusively from birth. Percentages for state and national averages do include infants who were formula fed at birth. Likewise, comparisons to Healthy People 2020 goals cannot be made, because at baseline, the sample did not include infants who were only fed formula.

## **Conclusions**

Intention and four week breastfeeding self-efficacy influence duration of exclusive breastfeeding. Since intention predicts duration of exclusive breastfeeding, researchers should use a reliable and valid measure of intention during the prenatal period. Self-efficacy is a partial mediator between intention and actual behavior and is associated with duration of exclusive breastfeeding. Therefore, interventions aimed at increasing breastfeeding intention and self-efficacy may increase duration of exclusive breastfeeding. Future research

should focus on interventions that begin during pregnancy and end after the infant is six months of age. Mothers need education and support over a longer period of time in order to breastfeed exclusively for six months.

Social support was not a significant predictor of duration in this study. Support was a significant factor mentioned in the focus groups by the mothers who breastfeed exclusively for 16 weeks. See Chapter Four for results of these focus groups. Therefore, additional testing with other reliable and valid scales should be done to determine the most efficacious measures of support.

Healthcare providers and healthcare facilities can do a number of things to increase the proportion of women who initiate breastfeeding and breastfeed exclusively for six months. Healthcare providers should begin educating mothers concerning the importance of breastfeeding in the prenatal period. Healthcare facilities should strive to become “Baby-Friendly”. “Baby-Friendly” status creates the education and support system necessary to foster exclusive breastfeeding. National initiation rates have increased, but exclusive breastfeeding rates remain low. Therefore, the healthcare system should continue to take the steps necessary to encourage exclusive breastfeeding.

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Table 3.1

*Measures at specific time periods*

Time of measurement	IFI	BSE-SF	SSI	HBSS	Demographic Data	Chart Review	Type of Breastfeeding
Baseline	X	X	X		X	X	X
2 weeks							X
4 weeks		X		X			X
8 weeks							X
12 weeks							X
16 weeks		X		X			X

*Note. IFI = Infant Feeding Intentions Scale; BSE-SF = Breastfeeding Self-efficacy- Short form; SSI = Social Support Inventory; HBSS = Hughes Breastfeeding Social Support Scale.*

Table 3.2

*Demographic Data*

<b>Variable</b> (n = 84)	
Age in years (n, %)	
18-24	13(15.5)
25-29	32(38.1)
30-34	28(33.3)
35-42	11(13.1)
Ethnicity (n, %)	
Caucasian	59(70.2)
African American	9(10.7)
Hispanic/Latino	5(5.9)
Asian/Other	11(13.1)
Marital Status (n, %)	
Single	8(9.5)
Married	63(75.0)
Co-habiting	13(15.5)
Education (n, %)	
Grades 1-11	3(3.6)
High School- Some College	19(22.6)
College Graduate	31(36.9)
Graduate Work	31(36.9)
Household Income (n, %)	
≤ \$14,999	7(8.3)
\$15,000-29,999	11(13.1)
\$30,000-49,999	13(15.5)
≥ \$50,000	47(56.0)
Don't know/Prefer not to answer	6(7.1)
WIC participation (n, %)	
No	58 (69.0)
Yes	26 (31.0)

Table 3.3

*Bivariate Analysis Where Exclusive Breastfeeding at 16 Weeks is the Outcome of Interest*

Covariate	Women Exclusively Breastfeeding at Week 16(n=37)	Women NOT Exclusively Breastfeeding at Week 16(n=47)	P-Value
Age (n, %)			0.01
18-24	1(2.7)	12(25.5)	
25-29	19(51.4)	13(27.7)	
30-34	13(35.1)	15(31.9)	
35-42	4(10.8)	7(14.9)	
Marital Status (n, %)			0.0005
Married	35(94.6)	28(59.6)	
Single	2(5.4)	8(17.0)	
Co-habiting	0(0.0)	11(23.4)	
WIC Participation (n, %)			0.002
Yes	5(13.5)	21(44.7)	
No	32(86.5)	26(55.3)	
Ethnicity (n, %)			0.2
Caucasian	29(78.4)	30(63.8)	
African American	1(2.7)	8(17.0)	
Hispanic	2(5.4)	3(6.4)	
Asian/Other	5(13.5)	6(12.8)	
Education (n, %)			0.0009
Grade 1-11	0(0.0)	3(6.4)	
High School-Some College	2(5.4)	17(36.2)	
College Graduate	17(46.0)	14(29.8)	
Grad Work	18(48.7)	13(27.7)	
<b>Scales-Total</b>			
IFI (Mean ± SD)	13.0±1.9	10.6±3.4	<0.0001
BSE Baseline (Mean ± SD)	51.0±8.0	51.7±9.0	0.7
BSE Week 4 (Mean ± SD)	56.4±7.3	48.7±12.1	0.002
BSE Week 16 (Mean ± SD)	59.4±7.5	49.2±13.6	0.006
SSI (Mean ± SD)	56.4±6.3	56.0±8.6	0.8
HBSS Week 4 (Mean ± SD)	94.1±20.0	94.3±20.2	>0.9
HBSS Week 16 (Mean ± SD)	94.4±19.0	96.8±20.5	0.7

Table 3.4

*The Ability of the IFI Scale Score to Predict Exclusivity at 16 Weeks*

<b>Parameter</b>	<b>95% Confidence Interval</b>	<b>P value</b>
Age	0.8-1.1	0.5
Marital Status	1.0-40.9	0.05
WIC Participation	0.1-3.6	0.6
Education	0.3-23.4	0.4
Ethnicity	0.4-4.5	0.7
IFI total score	1.1-1.7	0.007

Table 3.5

*Tests of Mediation of the Relationships of Breastfeeding Self-Efficacy and Social Support with Infant Feeding Intention*

1. Baseline BSE does not mediate the effect of IFI on exclusivity (n = 84)				
Predictor	Potential Mediator	Outcome	Standardized $\beta$ Coefficient for Predictor	P value
IFI		BSE	0.42	0.0003
IFI		Exclusivity	0.51	0.007
BSE		Exclusivity	-0.01	0.9
IFI	BSE	Exclusivity	0.70	0.004
2. 4 week BSE partially mediates the effect of IFI on exclusivity (n = 71)				
Predictor	Potential Mediator	Outcome	Standardized $\beta$ Coefficient for Predictor	P value
IFI		4 week BSE	0.62	0.004
IFI		Exclusivity	0.51	0.007
4 week BSE		Exclusivity	0.46	0.01
IFI	4 week BSE	Exclusivity	0.49	0.03
3. Social support does not mediate the effect of IFI on exclusivity (n = 84)				
Predictor	Potential Mediator	Outcome	Standardized $\beta$ Coefficient for Predictor	P value
IFI		Social Support	0.04	0.7
IFI		Exclusivity	0.51	0.007
Social Support		Exclusivity	-0.07	0.6
IFI	Social Support	Exclusivity	0.54	0.006

## **Chapter Four**

### **Introduction**

Breast milk is the normal and most efficacious way to feed an infant. National (76.9%) and Kentucky (59.4%) breastfeeding initiation rates fall short of the Healthy People 2020 goals (81.9%; Centers for Disease Control and Prevention [CDC], 2012). Exclusive breastfeeding rates at six months both nationally (16.3%) and in Kentucky (9.6%) fall well below the Healthy People 2020 goals of 25.5 percent (CDC, 2012). A better understanding of what factors foster exclusive breastfeeding is necessary to improve exclusive breastfeeding rates.

### **Literature Review**

Qualitative research on exclusive breastfeeding for at least four months is limited. Eight studies were reviewed for this project and are presented in Table 4.1. Support was the most commonly mentioned theme in the studies reviewed (Bai, Middlestadt, Peng, & Fly, 2009; Bottorff, 1990; Hauck, Langton, & Coyle, 2002; Hegney, Fallon, & O'Brien, 2008; Trado & Hughes, 1996). Mothers who sought and received support from other mothers and/or health care providers breastfed the longest. Many of the studies discussed the need for persistence or determination in order to make breastfeeding work (Bottorff, 1990; Hauck, Langton, & Coyle, 2002; Hegney, Fallon, & O'Brien, 2008). Participants who were willing to put in the time and effort necessary to ensure a successful

breastfeeding experience where the most successful. Several studies discussed how mothers used positive self-talk to get them through difficult periods (Bottorff, 1990; Hegney, Fallon, & O'Brien, 2008; O'Brien, Buikstra, Fallon, & Hegney, 2009). These encouraging messages allowed the mother to continue even when breastfeeding was difficult. Lastly, a number of studies found the benefits of breastfeeding as a major theme (Bai, Middlestadt, Peng, & Fly, 2009; Bottorff, 1990; Hegney & O'Brien, 2008; Trado & Hughes, 1996). The benefits mothers mentioned included a stronger bond with the baby, a healthier baby, a smarter baby, and that breastfeeding was easier than bottle feeding. The more benefits a mother understood and/or believed, the greater the likelihood that she would continue to breastfeed.

Antenatal breastfeeding education and support influence maternal breastfeeding experiences. A study conducted in the United Kingdom looked at the types of education and support mothers received antenatally (Cross-Barnet, Augustyn, Gross, Resnik, & Paige, 2012). Mothers were asked about prenatal care, in-hospital care and care from the baby's pediatrician. The role of fathers in making breastfeeding decisions was also explored (Datta, Graham, & Wellings, 2012). They reported that most men felt the decision was ultimately the mother's since it was her body. Men expressed their opinions, provided physical and emotional support, but left the final decision concerning initiation and duration of breastfeeding to their wife. In general, mothers reported that the education and support they received was not adequate. Fathers relied on the mother to make decisions pertaining to breastfeeding.

Maternal knowledge about the benefits of breastfeeding and the current recommendations regarding optimal duration of breastfeeding influence both initiation and duration of breastfeeding. Tarrant, Younger, Sheridan-Pereira, White, and Kearney (2010) reported that the most common reasons mothers gave for initiating breastfeeding were the benefits of breast milk (54%), mother-led reasons such as to promote bonding (18%) and encouragement from others (health-care professionals, family and friends, 15%). Mothers with higher scores on the Italian version of the Iowa Infant Feeding Attitudes Survey (IIFAS) were more likely to be breastfeeding at 12 months (Bertino et al., 2012). Higher scores on the IIFAS correlated with more positive views of breastfeeding. Viewing breastfeeding as important instead of very important was a risk factor for early weaning ( $p < .001$ ) in a group of mothers from Australia (Perrella et al., 2012). Australian mothers who were aware of the WHO recommendation to breastfeed exclusively for the first six months of an infant's life were more likely to initiate breastfeeding and continue to breastfeed at 12 months when compared to mothers who were not aware of the recommendation (Wen, Simpson, Rissel, & Baur, 2012).

Intention to breastfeed has been used widely to predict breastfeeding initiation and duration (Azulay-Chertok, Luo, Culp, & Mullett, 2011; Colaizy, Saftlas, & Morriss, 2012; Lawton, Ashley, Dawson, Waiblinger, & Conner, 2012; Nommsen-Rivers, Cohen, Chantry, & Dewey, 2010; Tarrant, Younger, Sheridan-Pereira, White, & Kearney, 2010). The theory of planned behavior (TPB) postulates that attitudes, subjective norms and perceived behavioral control all



impact intention to perform a behavior (Ajzen, 2002). Therefore, intention precedes actual behavior. A person's attitude, or favorable or unfavorable evaluation of a behavior, is formed through past experiences (Ajzen & Madden, 1986). Attitudes toward breastfeeding are formed by watching how other women feed their children, through personal experience with breastfeeding a child, and from information mothers receive about breastfeeding. Subjective norms refer to the individual's perceived social pressure for or against the behavior in question. Media, family, and friends all play a role in an individual's subjective norm. Breastfeeding norms are influenced by how a mother believes breastfeeding is viewed by society and her close family and friends. Lastly, perceived behavioral control is the person's belief concerning how easy or difficult it will be to perform a specific behavior. A mother's breastfeeding perceived behavioral control may be influenced by past experience, or by what she has heard and learned from other people. Intention is impacted by all of these beliefs and can be viewed as a person's motivation to perform the behavior. The probability that a person will actually perform a behavior increases as the strength of intention increases (Fishbein & Ajzen, 1975). Therefore, breastfeeding intention is related to the amount of effort a mother is willing to put into being successful at breastfeeding.

The specific aim of this qualitative study was to understand the experience of exclusive breastfeeding for 16 weeks and to describe the factors mothers used to breastfeed exclusively, for at least 16 weeks, in a sub-sample of mothers. Reasons for choosing to breastfeed and strategies that enabled success were discussed with mothers during focus groups. Two focus groups were conducted

with mothers who breastfeed their infant exclusively for at least 16 weeks. Exclusive breastfeeding for at least 16 weeks was chosen for the qualitative portion because of the relatively small number of women who actually breastfeed exclusively for six months. Bai, Middlestadt, Peng, and Fly (2010) reported that almost 80% of their mothers had started solid foods by six months. Additionally, some pediatricians continue to encourage the introduction of solids at four months. Mothers participated in the focus group that was the most convenient for them. The role of the theory of planned behavior in their success was also explored.

### **Subjects and Methods**

Ethical approval was obtained from the university medical internal review board prior to recruitment and data collection. Mothers ranged from 25 to 39 years of age with a mean age of 31.6 years. Eight of the mothers had a completed their college education and seven of the mothers had completed at least some graduate work. None of the mothers participated in WIC. The majority of the participants were Caucasian (93.3%). One mother was of Asian descent. All of the participants were either married (93.3%) or living with their significant other.

Qualitative data was collected during focus groups conducted after the infant was four months of age. Mothers were eligible to participate in the focus groups if they had breastfed their infant exclusively for at least 16 weeks. The meetings were held at a church in Lexington, KY. One focus group was conducted in the morning and one was conducted in the evening in an effort to

accommodate as many mothers as possible. Notes were taken during both sessions and one session was tape recorded. Participants were asked the following six open-ended questions: 1) Talk about the decision to breastfeed. 2) How long did you intend/plan to breastfeed? 3) How did your support system view your decision? 4) How do you think society views breastfeeding? 5) What was actually breastfeeding your baby like? 6) What helped you breastfeed exclusively? Additional questions were asked to elicit more information from participants when necessary. See Appendix A for the entire interview guide.

### **Data Analysis**

Qualitative description, as described by Sandelowski (2000), was the method used to collect and analyze the data. The principal investigator took notes during both focus groups. The second focus group was also tape recorded. The tape recording was transcribed by the principal investigator. After both focus groups were transcribed the text was entered into Atlas.ti 6.1.1 for coding and analysis. Data from each focus group were coded and analyzed separately, but similar data analysis procedures were carried out for both. Each group was read through to identify emerging themes. Similar themes from each group were merged and the most common themes were reported here. An expert in qualitative data analysis and two members of the PI's doctoral committee peer reviewed the data and found the same themes in the text. Member checks were performed by emailing the results to all 15 participants for validation. Five participants replied and stated that the results were accurate.

## Results

In total, 15 mothers participated in the focus groups. Focus Group 1 had seven participants and Focus Group 2 had eight participants. Five major themes emerged from the data: 1) knowledge, 2) peer experience, 3) perseverance, 4) support, and 5) the public.

### *Knowledge*

A majority of the mothers stated the benefits of breastfeeding as the main reason they chose breast milk for the sole source of nutrition for their babies. They liked knowing that their babies would be less likely to get infections because of the natural immunity given in mother's milk.

*“And learning about a lot of the benefits the loosing of the weight, healthier in terms of less likely to get ear infections, retain antibodies and all that other stuff.”*

*“I knew it was best for the baby; all the immunological things. It's good for the immune system.”*

Mothers also talked about how breastfeeding was natural, more convenient and cheaper than formula feeding.

*“It is the natural and healthy thing to do. [Breastfeeding is] also more convenient.”*

*“Just the thought of trying to make a bottle in the middle of the night just seems like, it's just why would I ever want to fool with that?”*

*“And one thing too that my husband and I talked about was that it would be cheaper to breastfeed. I don't think anyone has really mentioned that yet but, we were like dude I can't imagine you know having to do formula all the time because this is just so convenient and free. Except for feeding me, it's free!”*

The Internet was often a place to which mothers turned when they needed more information about breastfeeding or breast milk. Mothers did Internet

searches to find information about a variety of things such as the proper latch, and pumping and storing breast milk.

*“I used the [Name of website] forum... I would ask the forum and get an answer in 15 minutes or so.”*

*“Even on the [Name of Company] website and just like there’s not a lot of information about how to get started. You know the pump and all the pieces you’re like um how does this all go together? I found that really daunting.”*

*“It’s like you’ve kind of got to go on-line and I would [Name of search engine] everything and try to read when everyone said to start [pumping].”*

Overall, mothers knew that breast milk was the best form of nutrition they could provide for their infants and this knowledge gave them a strong desire to feed their babies only breast milk. They were going to do all they could to prevent having to use formula.

*“With us we had to supplement him [the older baby] in the hospital, and then he became a very gassy baby because the formula wasn’t sitting well with him. So going into it the second time I around I said I was going to do whatever it takes to not have to give him formula.”*

*“I did not want to use formula at all. I felt like I would be a failure if I had to switch.”*

*“I was breastfeeding and pumping after the baby came because I was so afraid of having to use formula. At one point I was making 15 ounces or so at a time, and I thought I had enough in the freezer, so I slowly started not pumping so much.”*

*“I had my first baby right after the big [Brand Name of formula] recall and I didn’t want to feed my baby something that could make them sick.”*

#### *Peer experience*

Many of the mothers knew someone who was breastfeeding or had breastfed in the past. This experience made them see breastfeeding as the normal, natural thing to for a mother to do.

*"I am one of seven and Mom breastfed all of us and it was just, he's actually grandbaby number 15 and they've all [been breastfed], it's just what you do."*

*"For me, I grew up in a household where all the women breastfed. My mother breastfed all of her kids; her mother breastfed in a time when they routinely gave you pills to dry up your milk. She refused them despite the doctors telling her that it was the best thing for her to give them formula. And I didn't even think about formula feeding at all, like it didn't even occur to me that I would do that, fed formula."*

*"I just think there wasn't really ever like a, 'I'm not going to'. I always I mean I never thought I was always going have children, but when I found out that I was pregnant it was just always I was going breastfeed. It [formula] was not an option."*

Friends and family with previous breastfeeding experience also helped encourage mothers when they were uncertain or experiencing difficulties.

*"Three of my friends were all due within two weeks of each other. It was nice to be able to call each other and say, 'This is happening, did you go through that? What did you do about it?'"*

*"Um there was like a huge boom at UK and there were a number of people having babies like all in a row so a lot of our friends you know ... had breastfed before. And one friend ... was asking like, 'Are you going to breastfeed?' And I said, 'Yeah' and she's like, 'Oh that's great and if you have any questions just let me know!' You know. So, that was really helpful."*

*"My sister has a baby that's ... 6 months older than him so she was a huge help. Um, just from like being able to ask the awkward questions about you like, 'What does this feel like? Is it supposed to look like this?' And um, it was really nice to have her and having gone through it so recently."*

### Support

Lactation consultants were the main source of support and information mothers mentioned.

*"I wasn't sure how long I could keep doing this...but fortunately the lactation consultant's at [University name] I talked to them and they helped me figure out what was going on. Thankfully I learned how to change things, but that really tested whether or not I wanted to keep doing it because having a baby fuss while you are trying to nurse is very disconcerting. It makes you feel really bad."*

*“She kept making this clicking noise and it was breaking suction. And it turned out, I finally called a lactation consultant and I said, ‘You know I’ve given it some time and I just know something is not right’. And I took her in and she had to have her frenulum clipped because she was just a little bit tongue tied.”*

*“The lactation consultant has been very encouraging. I had some problems at first and the lactation consultant helped me work through that.”*

Mothers also mentioned that support from their spouse and friends was invaluable.

*“I was breastfed and my husband was really supportive because he was not. He has some health problems and he really wanted me to breastfeed because he felt like he has those problems because he wasn’t breastfed.”*

*“Having a supportive husband [helped me breastfeed]. It would have been hard if he had said, ‘Just let me give the baby a bottle of formula and you go do whatever.’”*

*“Three of my friends were all due within 2 weeks of each other. It was nice to be able to call each other and say, ‘This is happening, did you go through that? What did you do about it?’”*

*“I had some knowledge of what to expect through friends.”*

These mothers sought out support and information so they could continue to provide breast milk for their babies exclusively, because they knew breast milk provided the best nutrition.

### *Perseverance*

Many mothers mentioned issues like pain and difficulties. These small bumps in the road did not stop them from breastfeeding. They merely looked for solutions to their problems.

*“The first month was the hardest for me ... I went a couple times to the lactation consultant because you know, she had lost weight directly after ah getting out the hospital and all that. So, I’m like, ‘Oh my God am I going ever get through this?’ And after that first month it got a lot better. I kept, I kept wondering and telling my husband you know, ‘I really wonder how long I can keep this up?’”*

*“I had one or two weeks of pain and then it got better.”*

*“I was making so much milk I had a freezer full of milk when I was pumping at work. And then when um, when I got my menstrual cycle back it dropped and now at the week when I’m on, I get half the supply...But, I started taking some supplements and it seemed to help increase my supply. I just kind of researched it myself and started taking it.”*

Even among these mothers who successfully breastfed their babies exclusively for 16 weeks, uncertainty was a common theme. Mothers were uncertain if their babies were getting enough milk. They were uncertain if they should give a pacifier, about when to start pumping and about how to store the milk. Even that did not stop them.

*“In the hospital they always used pillows, so I thought she had to use pillows and could never get comfortable. Then I realized I didn’t have to use pillows.”*

*“The first baby was really hard. So, this time I was determined to get my latch right from the beginning. I had the LC in the room every time I fed. I wanted to make sure I was doing it right. I knew you could do it without any pain. This time it was like I had been breastfeeding for 12 months when we started. I wasn’t ever sore.”*

*“Well I mean you feel control but being my first child I really didn’t know if I was doing everything right or if she was getting enough. I mean I knew that she was latching on right, but she would stop eating and I would be like, ‘Is there milk in there still? Is she still hungry, did she eat enough?’ I still do that I’m like, ‘She’s done, but did she really eat enough?’ I think as long as she’s happy that I don’t need to agonize over whether I’m doing it right or not. If she’s happy she probably knows what is best.”*

*“Especially with the overnight feeding she goes back to sleep with it. So, I’m nursing her back to sleep all the time and I’m not sure if that’s right, but at two in the morning there’s really nothing else to do but let her go back to sleep.”*

Mothers also had to persevere at work. Working mothers were thankful for the ability to pump, but had to figure out details such as where they would pump and who would take over their responsibilities while they were gone.



*“When I decided to breastfeed my family was really supportive. I had no problems there, but um when you go back to work like ... I have to make all the decisions. Where am I going breastfeed? What times I am going to go? That sort of thing. They allow me to do it, they are supportive in that way, but they don't provide things. I had to think it out myself.”*

*“They [my co-workers] haven't been, nobodies said anything. They kind of don't like my door shut, you know for as long as it is, because it takes longer than normal or whatever but, you know this is what I've got to do and uh they haven't said anything. I mean they're not all supportive but they're not like unsupportive either.”*

*“My co-workers took it better than I thought. I was worried that it would be hard since there are only two nurses and the other nurse would have to take care of all 10 patients while I pumped. As long as I get everything settled before I go, and make sure they [my patient's] don't need a drink or snack, everyone is really good about it. My co-workers are very understanding and supportive.”*

When experiencing a difficulty or feeling uncertain or uncomfortable participants used their own intuitions, and the support of lactation consultants, friends, family and the Internet to guide them. If they did not have the answer, they did their best to find it. They persevered because they knew this was what was best for their babies.

### *The public*

Mothers discussed the mixed message they felt society portrayed. They felt like the media talked about how good breastfeeding was, but did not want to see women actually feeding their babies.

*“I think breastfeeding campaigns make a difference. They say that breastfeeding is best. Some media information seemed like a confirmation. I feel like the public is more accepting now.”*

*“I think now society is kind of like you should breastfeed, you should breastfeed, you should breastfeed. But you know, they need to have more policies with working moms who are pumping and you know women should feel comfortable with nursing in public without having to worry about somebody saying something. And not making them feel bad because I'm like if your baby has to eat no matter*

*where you're at you know that like you said they are in charge. If they are hungry they want to eat. I've gotten to the point where I just don't care anymore, so. I can see where some people that's a big issue. Like I know one girl, she did not breastfeed because she didn't know what to do in public. So it's like I wish that would change. So people could see it as normal and not get freaked out about it."*

*"It's kind of a double message. You should breastfeed because it's best, but don't let us see you do it."*

Mothers also expressed feeling uncomfortable breastfeeding in public.

Mothers expressed feelings of immodesty when breastfeeding in front of others, especially extended family and men. Other mothers wanted breastfeeding to be seen as normal and therefore, did not mind breastfeeding in public at all. They wanted society to view breastfeeding as the normal way to feed your baby.

*"I breastfed in public if I have to, but I have a nursing shawl. I don't know if anybody's ever had anybody say anything to them. And you can't see things. I haven't had issues."*

*"I've been very self-conscious about it. Like my in-laws came to my house and I put a drape over myself, and you know this is in my own house, I put a drape over myself because I was just like I didn't feel comfortable breastfeeding around them in the same room ... I mean my mom I was fine with her being there in the hospital seeing everything, and I'm fine with my friend from another country where breastfeeding is everywhere all the time ... It didn't bother me to breastfeed in front of her because that's just normal for her. But it's weird, I don't see my in-laws that often."*

*"Even some people who were supportive felt awkward around me when I fed the baby, but that didn't stop me from wanting to breastfeed."*

*"I haven't [had issues] with nursing in public, but I've just gotten to where I don't care and nobody's said anything. Because I feel like if I do it more it will become more normal."*

*"People still see breasts as sexual, not something to provide your baby nutrition with; even though I'm more covered up than most people walking around."*

Mothers were asked to discuss what helped them exclusively breastfeed for 16 weeks. It was obvious from talking to them that their drive and desire to

feed their baby the best nourishment possible was an impetus. Flexibility at work and home allowed them to balance the responsibilities of daily life and a new baby. Mothers needed the ability to bring their baby with them to the store and restaurants. They also needed the time and space to pump while at work. They made up their minds that they were going to breastfeed, and put in the time and effort necessary to make exclusive breastfeeding work.

### **Discussion**

The mothers' knowledge concerning the benefits of breastfeeding influenced their attitudes toward breastfeeding. All of the mothers decided to breastfeed their babies before or during pregnancy. Increased knowledge about how good breast milk is for the infant and the personal benefits might have influenced each mother's decision to breastfeed. Mothers who breastfed exclusively for 16 weeks also tended to have a negative view of formula. They stated that they would feel guilty if they ever had to give their baby formula. Other mothers remembered the formula recalls and did not want to give their baby something that could make them sick. This negative attitude toward formula strengthened the positive attitudes they had toward breastfeeding.

When mothers were asked how much control they felt they had over breastfeeding they overwhelmingly felt like the baby was the one in control. They laughed at how hard it was to anticipate the change a baby would bring in their lives. Despite feeling like the baby was in control of most of their schedule, mothers actively sought out support and information when they were unsure. This suggests that these mothers felt a high degree of control over their

breastfeeding success. They understood that if they looked for help or more information they could solve any problem that arose. If they had an issue, they sought out the information and support they needed in multiple ways. Mothers mentioned lactation consultants and searching for information on the Internet as the two main sources of support and information. At the same time, mothers came to realize that some of the control must be given to the baby and made peace with this new way of living.

Intention among these mothers was high. A majority of the mothers (86%) stated they intended to breastfeed exclusively for six months. Mothers understood the benefits and were willing to do their best to make it to their goal. They were also confident in their ability to accomplish this task. When asked, most mothers reported that they felt they would reach their exclusive breastfeeding goal. Mothers stated that they believed they would breastfeed exclusively for at least six months.

These data suggest that the TPB can be applied to exclusive breastfeeding. According to this theory, attitudes, subjective norms, and perceived behavioral control all impact intention to perform a behavior. Attitudes toward breastfeeding among these mothers were overwhelmingly positive. They knew that breast milk provided best nutrition for their babies and they also knew the personal and financial benefits of breastfeeding. Many of the mothers had peers who had breastfed or were breastfeeding. This indicates that these mothers' subjective norms included that it was normal to breastfeed your baby. Mothers did mention that society seemed to send a mixed message, but it

appears that a positive attitude and peer experience outweighed negative messages from society. Lastly, these mothers exercised a high degree of control over their behavior. They talked to lactation consultants, searched the Internet and asked friends and family when they encountered difficulties. This indicates that among these mothers, perceived behavioral control was high. Even though attitude, subjective norm and perceived behavioral control influence behavior to a high degree, the opinions of health care professionals also do.

Health care professionals have a strong influence on the feeding choices parents make. One mother stated that her pediatrician recommended adding rice cereal at four months. She reported that her pediatrician was very concerned about the baby's weight while being breastfed. Pediatricians and Pediatric Nurse Practitioners need to be familiar with the AAP recommendations to breastfeed exclusively for the first six months of an infant's life. Additionally, they should be using the WHO growth charts to track growth for breastfed babies. These charts are much more accurate indicators of the normal growth curve in breastfed babies when compared to the CDC growth charts (Grummer-Strawn, Reinold, & Krebs, 2010). Mothers reported that the information health care providers (obstetricians, nurses, and pediatricians) provided them with concerning breastfeeding was often incomplete or not in-depth enough to really foster successful breastfeeding (Cross-Barnet, Augustyn, Gross, Resnik, & Paige, 2012). Current practitioners must educate themselves on the appropriate management of the breastfeeding mother and be knowledgeable concerning the resources available in their area.

Mothers were concerned about modesty around men, extended family, and strangers. Breastfeeding in public or in front of certain people, especially men, made most mothers uncomfortable. Therefore, most of them used some sort of cover-up in public to maintain modesty. These uncomfortable situations did not deter them from breastfeeding. Literature also reports that women often feel like breastfeeding in public is embarrassing (Perez-Escamilla, 2012; Tarrant, Younger, Sheridan-Pereira, White, & Kearney, 2009). As a society we should strive to normalize breastfeeding.

Many of the factors mentioned by the mothers such as education, public perception, and support are modifiable. Health care providers can ensure that all mothers are given information and educated about the benefits of breastfeeding during pre- and postnatal appointments. Public health campaigns can be used to normalize breastfeeding and allow mothers to see what breastfeeding looks like. Peer experience was an important part of the mothers in the focus groups success. Health care providers should encourage the use of lactation consultants after discharge. Fathers and family members should be taught to help, nurture and support a mother while she breastfeeds. The media has the opportunity to positively influence society's view of breastfeeding. Breastfeeding campaigns should focus on education and normalizing breastfeeding, because increasing the proportion of women who breastfeed exclusively for six months would improve public health.

Participants reported receiving mixed messages from society with regard to breastfeeding. They reported that society told them breastfeeding was the best

thing to do, but it was inappropriate to let anyone see you actually breastfeeding. Mothers also reported mixed responses from family and friends. They described some family members as supportive and said others were not. The availability of support whether it was a friend, lactation consultant, or family member was vital to foster exclusive breastfeeding. Mothers often called their friends or a lactation consultant to ask questions. They asked about whether certain behaviors were normal and issues with breastfeeding such as pain and pumping. Husband's opinions and support were also very important. A Cochrane review reported that both lay and professional support positively impacted breastfeeding duration (Britton, McCormick, Renfrew, Wade, & King, 2007). Other studies also reported the importance of some type of breastfeeding support on breastfeeding duration (Datta, Graham, & Wellings, 2012; Bosnjak, Grguric, Stanojevic, & Sonicki, 2009).

Returning to work was a big transition for many of the mothers. They reported that having the opportunity to pump at work was the only reason they were able to succeed. A few mothers discussed the difficulties they experienced with finding a place and time to pump. Research indicates that a supportive work environment increases breastfeeding duration (Balkam, Cadwell, & Fein, 2011; Guendelman et al., 2009). Longer maternity leave is also associated with increased breastfeeding duration (Ogbuanu, Glover, Probst, Liu, & Hussey, 2011; Skafida, 2012).

Healthcare facilities decisions to not dispense formula can impact breastfeeding duration. After completion of the second focus group, a mother

mentioned that it was helpful that the university hospital did not give discharge packs with formula to breastfeeding mothers. She thought having to drive to the store to get formula might discourage some mothers from supplementing. Her comments are supported by the literature. Hospitals that are “Baby Friendly” have longer breastfeeding duration rates (Camurdan et al., 2007; Declercq, Labbok, Sakala, & O’Hara, 2009; DiGirolamo, Grummer-Strawn, & Fein, 2008). “Baby-Friendly” hospitals begin supporting breastfeeding during the prenatal period and continue to ensure support after discharge from the hospital.

Participants may have been unclear about the definition of exclusive breastfeeding. Two of the mothers reported supplementing their infant with formula on one or two occasions during the first 16 weeks of the infant’s life. It is unclear why these mothers continued to classify themselves as breastfeeding only. Mothers may not think it is important if they only feed the baby formula on one or two occasions. They may think that since they are feeding their baby breast milk most of the time that supplementing with formula a couple times doesn’t matter. It might have been helpful to ask about current feeding method and supplementation. For this study, mothers were asked how they were feeding their babies (breast milk only, formula only or a combination of breast milk and formula). Asking whether the mother had to use any formula may have identified the mothers who only used formula on one or two occasions.

Video recording may have enhanced data analysis. The ability to see non-verbal responses from the participant speaking and the non-verbal responses given from the other participants as a result could have made data analysis



richer. Only one of the focus groups was tape recorded. This resulted in lost data, because the PI only had data from her notes for the other focus group. A reliable data recording device is necessary to obtain the most data.

These mothers displayed a great deal of tenacity. Despite difficulty, and feelings of embarrassment and uncertainty many women who chose to breastfeed persevered. Most women knew breast milk was the normal and healthiest way to feed their babies, thus were willing to do whatever it took to succeed. These mothers have taught us a lot about what it takes to breastfeed exclusively. Obstetricians and midwives need to encourage breastfeeding and provide information and resources beginning in pregnancy. Hospitals should continue to move toward becoming “Baby Friendly”. Pediatricians and nurse practitioners should be comfortable with providing guidance and resources to breastfeeding mothers. Lastly, the importance of lactation consultants cannot be overlooked. Mothers need easy access in the hospital and after discharge to a provider who specializes in breastfeeding care. Exclusive breastfeeding can be challenging. Therefore, prenatal education should provide realistic yet supportive data by discussing barriers to successful breastfeeding. Participants who were able to navigate through real and perceived barriers were more likely to breastfeed exclusively.

Knowing that breast milk is best is not sufficient to encourage exclusive breastfeeding among most women. Endorsements from major organizations such as the American Academy of Pediatrics (2012) and the World Health Organization (2001) has not been enough either. We can no longer merely state

that breastfeeding is best. In order to breastfeed exclusively, mothers need to understand the reasons that breastfeeding is best, they need to receive positive messages about breastfeeding from friends, family and the media and they need a strong support system that encourages breastfeeding.

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Table 4.1

*Qualitative Breastfeeding Studies*

Author (Date, Country)	Purpose	Sample	Theory	Findings/Themes
Bai, Middlestadt, Peng, & Fly (2009, USA)	To explore factors underlying EBF for six months	Postpartum women (n = 25)	TPB	Stratified themes into behavioral beliefs (attitude), normative beliefs (subjective norm), control beliefs (perceived behavioral control), and barriers Helping bond with baby and making baby healthier were the most commonly cited advantages Approval from father and friends were most commonly cited normative beliefs The most commonly stated control beliefs had to do with social support and breastfeeding skills Barriers included returning to work and having a breastfeeding complication or lack of knowledge
Bottorff (1990, Canada)	To better understand the experience of mothers who breastfeed	Postpartum women (n = 3)	None specified	Themes: <i>Persistence, Deciding to breastfeed, Giving, Commitment</i> Intention and 'to do' versus 'to try' discussed. Discusses positive self-talk and support from others.
Cross-Barnett, Augustyn, Gross, Renick, & Paige (2012, USA)	To examine breastfeeding education and support received pre- and postnatally	Postpartum mothers who were WIC participants (n = 75)	None specified.	49% of mothers received some sort of prenatal education from their obstetrician. In most cases it was a pamphlet. Most mothers were encouraged to supplement their baby while in the hospital. All babies admitted to the NICU were supplemented with formula. A little over a third of the mothers reported that their pediatrician asked about feeding but did not provide any further information.
Datta, Graham, & Wellings (2012, UK)	To evaluate an intervention and to explore the role women felt fathers played in breastfeeding	Fathers of breastfed babies (n= 14) and their wives (n= 3)	None specified	Themes: <i>The father's role in the decision, The father's role after delivery, The father's role when there are breastfeeding difficulties</i>
Hauck, Langton, & Coyle (2002, Australia)	To explore the breastfeeding experience of women who had breastfeeding difficulties	Postpartum women (n = 10)	None specified	Themes: <i>Path of determination, Searching for answers, Exhaustion, Staying on the path</i> -Three subthemes contributed to their ability to persist: encouragement, individualized assessment and advice, and seeing signs of improvement.
Hegney, Fallon, & O'Brien (2008, Australia)	To investigate the factors empowering women to continue to breastfeed despite difficulties	Women who experienced difficulties and continued breastfeeding (n = 20) compared to women who experienced difficulties and discontinued breastfeeding (n =20)	None specified	Themes: <i>Expectations, Support issues, Coping strategies</i> Women who discontinued were less likely to have outside support and less likely to seek support elsewhere.

Table 4.1 (continued)

Author (Date, Country)	Purpose	Sample	Theory	Findings/Themes
O'Brien, Buikstra, Fallon, & Hegney (2009, Australia)	To discuss the qualitative results of two related studies in order to determine the strategies that assist in continuing breastfeeding	Postpartum women	None specified	<u>Findings in both studies:</u> <i>Increasing breastfeeding knowledge, Trying to stay relaxed and looking after yourself, Use of positive self-talk, Challenging unhelpful beliefs, Active problem solving</i>
Trado, & Hughes (1996, USA)	To describe breastfeeding in the WIC population	First time postpartum mothers (n = 11)	None specified	Themes: <i>Informational support, Emotional support, Instrumental support</i>

## Chapter Five

### Conclusions

The benefits of breast milk are astounding. Breast milk not only provides all the calories, nutrients, and water an infant needs to grow and thrive, research reports that it provides immunity from a wide range of illness and protects the infant from future issues such as leukemia, diabetes, obesity, food allergies, asthma and eczema. Breast milk lays the foundation for a healthy future. The benefits of breast milk do not stop at the infant. Mothers who breastfeed their babies are less likely to get breast and ovarian cancer and are less likely to develop Type 2 diabetes later in life. Breastfeeding saves families money because they are not buying formula. Healthier babies translate into parents who have to miss less work because of a sick child. Missing fewer days of work means increased productivity for employers. Less illnesses means decreased money spent on healthcare. Therefore, the state and the nation save money when mothers breastfeed because they are spending less money on healthcare.

In summary, the purposes of this dissertation were to: a) explore the role of breastfeeding intention, self-efficacy and support on duration of exclusive breastfeeding, and b) determine the factors that encouraged exclusive breastfeeding among women who breastfed exclusively for at least 16 weeks.

According to the WHO definition, very few mothers are able to breastfeed their infants exclusively from birth. Measuring breastfeeding at multiple time points and then determining an overall pattern of feeding may be the most accurate way to classify and report feeding method (Noel-Weiss, Boersma, &

Kujawa-Myles, 2012). Inconsistencies in breastfeeding definitions make comparisons across studies difficult. Using common definitions would add to the value of breastfeeding research.

In Chapter Two the current state of the measurement of breastfeeding intention was explored. Multiple instruments are currently being used to measure breastfeeding intention. These inconsistencies make comparisons between studies complex. Three types of scales were discussed: 1) question format, 2) Likert-scale, and 3) the Infant Feeding Intentions (IFI) scale. Four of the Likert scales showed promise and should continue to be tested in diverse populations to add to their reliability and validity. A number of the scales reviewed did not measure intended duration of exclusive breastfeeding. This construct aids in the ability to understand what factors would increase the proportion of women who breastfeed exclusively. The IFI scale measures both intentions to initiate breastfeeding and to breastfeed exclusively over a period of time. Both of these measurements are important when determining exclusivity rates over time. This scale measures both intentions to initiate and to breastfeed exclusively.

In Chapter Three the quantitative data collected by the principal investigator were explored. This included the factors that influenced intention to breastfeed and actual breastfeeding duration. Mothers who breastfed their babies exclusively for 16 weeks were more likely to be Caucasian, married, and have a college degree. Intention and breastfeeding self-efficacy as measured at four weeks predicted duration of exclusive breastfeeding.

Chapter Four explored the findings from the qualitative portion of the principal investigator's study. A number of themes emerged from the data. Mothers sought out knowledge from various sources in order to make their decision to breastfeed and to solve problems when they arose. A majority of mothers knew breast milk was the best nutrition they could provide for their infants. Many of the mothers also reported personal benefits such as weight loss as reasons to breastfeed exclusively. Knowledge was gained from a number of sources such as the Internet, lactation consultants, friends, and family. Most of the mothers had a peer, mother, sister, co-worker, or friend, who breastfed. Peer experience played an important role in initiation and duration of exclusive breastfeeding. Support from lactation consultants, spouses, and friends was another common theme. Mothers used this support to help them handle difficult situations that arose. Perseverance arose as a theme. These mothers did whatever was needed to breastfeed their baby. They asked lactation consultants, searched the Internet, and called a friend or family member when they were not sure how to handle a situation. Any problem that arose was seen as something to be conquered, not something they could not overcome. They believed in the benefits of breastfeeding their baby and would not give up easily. In the mothers' eyes, the public sends a mixed message about breastfeeding. The public seems to say that breast milk is best, but we should not see you actually breastfeeding. Mothers struggled with finding a place to pump at work and feeling uncomfortable breastfeeding in restaurants and around extended family. Finally, mothers stated that being able to stay home or having a flexible work schedule and support were

some of the main reasons they were able to breastfeed exclusively for 16 weeks. They also discussed a determined attitude toward breastfeeding exclusively. There was no “we’ll try it and see.” It was a “we are going to do this.”

### **Limitations**

There are a number of limitations to this study. Measuring breastfeeding intention during the prenatal period may be more accurate than measuring it during the postnatal period. Research should strive to determine the most accurate time to measure breastfeeding intention. Mothers were followed for 16 weeks not six months. Following the mothers for an additional two months may have added to the richness of the data. Future research should follow mothers for a minimum of six months in order to better understand the factors that influence exclusive breastfeeding for six months. Only one of the focus groups was tape recorded. This resulted in lost data and may have impacted data analysis. Notes were taken during both focus groups, but more data were collected during the second focus group because it was tape recorded. Lastly, a majority of the mothers in this study were Caucasian, married and had at least a college degree. These data may not be generalizable to other populations. Research in more diverse populations is necessary to determine the generalizability of these findings.

### **Recommendations**

Future research can help increase exclusive breastfeeding rates by focusing on a few key factors. Researchers should focus on determining the



most appropriate time to measure breastfeeding intention. This will increase the reliability and validity of any scale measuring breastfeeding intention.

Researchers should continue to focus on determining the most accurate scale for measuring social support and breastfeeding support. Future studies should strive to gain a better understanding of the specific types of support that encourage exclusive breastfeeding. Finally, researchers should continue to test interventions targeted at increasing knowledge and support in the prenatal and postpartum periods.

Breastfeeding mothers need information and support in order to succeed. Breastfeeding campaigns could be used to increase breastfeeding awareness. Sharing the benefits of breastfeeding with patients beginning in pregnancy will enable healthcare providers to positively influence breastfeeding rates. Pediatric health care providers that are knowledgeable about assisting with breastfeeding difficulties can assist patients who are at risk for early weaning. Referring patients to a lactation consultant more readily could also decrease the number of mothers who wean their infant prior to the recommended time period. Increasing the proportion of “Baby-Friendly” hospitals may increase breastfeeding initiation and duration rates. Grants are available for hospitals interested in becoming “Baby-Friendly”. The personal and societal benefits of breastfeeding require that we take a more proactive stance in improving national and state breastfeeding rates.

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## Appendix A Interview Guide

Talk about the decision to breastfeed...

How did you make it?

When did you make it?

What role did HCP, significant other, family, and friends play in your decision?

What part did media play?

What part did the view of co-workers or acquaintances play?

How long did you intend/plan to breastfeed?

How likely did you think you were to actually breastfeed that long?

Did you plan on breastfeeding exclusively?

If so, for how long?

What made you decide to breastfeed exclusively?

How comfortable with feeding your baby formula were you?

How did your support system view your decision?

Parents?

Siblings?

Spouse/significant other?

Children?

Friends?

Co-workers?

Did you know anyone who breastfed their baby?

How do you think society views breastfeeding?

What did you think breastfeeding was going to be like?

Easy or hard?

How much control did you think you had over breastfeeding your baby?

What things could you do to control your success or failure?

What was actually breastfeeding your baby like?

Did you have problems?

If so, what did you do to get past them?

What helped you breastfeed exclusively?

Did you do specific things to ensure your success?

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## Vita

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#### Objective:

Clinical Instructor/Part-time Faculty

#### Education:

Doctor of Philosophy in Nursing, University of Kentucky College of Nursing, Lexington, Kentucky, August 2013.

Master of Science in Nursing, Pediatric Nurse Practitioner Track, University of Kentucky College of Nursing, Lexington, Kentucky, May 2004.

Bachelor of Science in Nursing, University of Cincinnati College of Nursing, Cincinnati, Ohio, June 2001.

Diploma, Christ Hospital School of Nursing, Cincinnati, Ohio, August 2000.

#### Employment:

University of Kentucky College of Nursing, Lexington, Kentucky, August 2011- present

##### CLINICAL INSTRUCTOR-

- Oversee three undergraduate clinical groups (1 junior group and 2 sophomore groups)
- Collaborate with the nursing staff on both the East and West wings of the Kentucky Children's Hospital and in the PICU, NICU, and Outpatient Unit
- Collaborate with the teachers and staff at elementary schools
- Facilitate student opportunities to practice assessment and technical skills and develop critical thinking skills
- Guest Lecture for 2-hour class on pediatric endocrine disorders at the University of Kentucky, College of Nursing for one semester
- Guest Lecture for 2-hour class on pediatric musculoskeletal disorders at the University of Kentucky, College of Nursing for two semesters
- Guest Lecture for 2-hour class on pediatric neuromuscular disorders at the University of Kentucky, College of Nursing for one semester

Kentucky State University School of Nursing, Frankfort, Kentucky, August 2009- May 2011.

ASSISTANT PROFESSOR-

- Didactic content for Pediatric, Medical/Surgical and Critical Care rotations
- Clinical instructor for Pediatric, Medical/Surgical and Critical Care rotations
- Manage Blackboard for Pediatric, Medical/Surgical and Critical Care courses
- Administer and grade dosage calculation quizzes
- Administer and grade course exams
- Grade nursing care plans for Pediatric, Medical/Surgical and Critical Care rotations
- Advise pre-nursing and nursing students
- Manage students questions and concerns

University of Kentucky College of Nursing, Lexington, Kentucky, August 2008- May 2009.

TEACHING ASSISTANT-

- Grade literature review assignments for 15 graduate students
- Grade exams for 15 graduate students
- Grade presentations for 40 graduate students
- Help manage Grade Center on Blackboard for 2 graduate classes
- Guest Lecturer for 2 graduate level nursing research classes

University of Kentucky College of Nursing, Lexington, Kentucky, August 2005- December 2008.

CLINICAL INSTRUCTOR- (See present UK employment for description.)

Family Care Center, Lexington, Kentucky, October 2007- January 2010; August 2011- present

CERTIFIED PEDIATRIC NURSE PRACTITIONER-

- Diagnose and manage various acute pediatric illnesses
- Conduct routine well-child physicals for infants, children, and adolescents
- Collaborate with physicians, advanced registered nurse practitioners, registered nurses and certified nurse assistants to provide quality patient care
- Chart on an electronic medical records system

Pediatric Associates of Frankfort, Frankfort, Kentucky, October 2004- July 2005.

CERTIFIED PEDIATRIC NURSE PRACTITIONER- (See above.  
Same responsibilities.)

University of Kentucky College of Nursing, Lexington, Kentucky, August  
2002- May 2004.

RESEARCH ASSISTANT-

- Nurse Interventionist for a National Institutes of Health (NIH) funded clinical trial
- Educated children with asthma and their parents how to better manage their asthma at home based on the National Asthma Education and Prevention Program (NAEPP) Guidelines
- Certified as an Asthma Educator by the American Lung Association of Kentucky
- Publication: Burkhart, P., Rayens, M.K., & Bowman, R. (2004). An evaluation of children's metered-dose inhaler technique for asthma medications. *The Nursing Clinics of North America*.
- Paper Presentation: Burkhart, P., & Bowman, R. (2004, February). *Adherence to medication administration: Are children using their inhaled asthma medications correctly?* Southern Nursing Research Society, 18<sup>th</sup> Annual Conference, Louisville, KY.

University of Kentucky Children's Hospital, Lexington, Kentucky, October  
2001-December 2003.

CLINICAL NURSE II

Children's Hospital Medical Center, Cincinnati, Ohio September 2000-  
July 2001.

CLINICAL NURSE I

**Certifications:**

Advanced Registered Nurse Practitioner, State of Kentucky, 2004-present  
Certified Pediatric Nurse Practitioner, 2004-present  
Registered Nurse, State of Kentucky, 2001-present  
Basic Life Support for Health Care Providers, 1998-present

**Professional Affiliations:**

Sigma Theta Tau International, Delta Psi Chapter, 2000-present