

WHY DO WOMEN STOP AFTER SUCCESSFULLY  
BREASTFEEDING FOR 3 MONTHS?

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WHY DO WOMEN STOP AFTER SUCCESSFULLY  
BREASTFEEDING FOR 3 MONTHS?

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#### ABSTRACT

**Purpose:** The purpose of this study was to identify potential maternal demographics and infant characteristics associated with breastfeeding termination after 3 months. The study focused on personal and social factors contributing to breastfeeding success.

**Subjects:** Women (n= 121) who had already participated in a previous research were asked to complete an online survey in October and November 2012 with a response rate of 45%.

**Methods:** The Quantitative section included 21 statements describing why women stop breastfeeding. The Qualitative section included 4 open ended questions asking the women why they thought other women failed to breastfeed to 3 months, what healthcare providers and communities can do to help support breastfeeding for 12 months, and where they received the most support for their decision to start and continue breastfeeding.

**Results:** Women who received unemployment (p=0.003) or state/federal assistance (p=0.043) for a shorter period of time stopped breastfeeding before 6 months. Only 52% of women who reported incomes over \$60,000 were still breastfeeding at 9 months (p=0.053) compared to 81% of women below \$60,000. Only in the self-weaning factor was the mean over 1.5 and *my infant's age* was the reason that contributed the most to termination. There was a correlation between the age of the infant when breastfeeding stopped and *my significant other wanted me to stop* that approached significance (r=0.294, p=0.055). There was a significant correlation between the psychosocial and lifestyle factors (r=0.514, p=0.000). When women were asked their opinions on why the majority of mothers stop breastfeeding before 3 months 3 common themes emerged: Inconvenience/Discomfort, Return to Work, and Lack of Support. Additional themes that emerged from the survey were *Encouragement* from healthcare support, *More private spaces* for community support, and *Husband* was the primary supporter.

**Conclusions:** In this survey, infant age was the factor that contributed the most to why women stop after successfully breastfeeding for 3 months. Healthcare providers, communities, and significant others all play different but important roles to help mothers breastfeed until the infant is one year old.

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## CHAPTER I

### INTRODUCTION

Breast milk is, “species specific,” to human infants. It is what infants were designed to consume and all other infant feeding practices are inferior to the nutritional content of breast milk (American Academy of Pediatrics (AAP), 2005). Breastfeeding has been shown to decrease the risk of bacterial infections in infants and delay adult onset health issues (AAP, 2005). It has also been shown to decrease the risk of both ovarian and breast cancer for women who breastfeed. The majority of these benefits begin to manifest after at least 3 months of breastfeeding (AAP, 2005). Breastfeeding an infant has also been linked to a potential decrease in medical expenses (AAP, 2005). Studies have been done on the amount of pediatric health care costs that are directly related to diseases that are at a decreased risk of occurrence in a breastfed baby. One analysis of past data (2005 CDC data and using 2007 dollars) done by Bartick and Reinhold (2010) looked at the health care costs among 10 diseases that showed a decrease in relative risk by breastfeeding duration. The analysis discovered that if 90% of U.S. families complied with the recommendation to exclusively breastfeed for 6 months then pediatric healthcare costs could be decreased by \$13 billion per year and 911 infant lives would be saved.

In 2007, the Agency for Healthcare Research and Quality (AHRQ) evaluated the short-term and long-term effects of breastfeeding on maternal and infant health in developed countries (Ip *et al.*, 2007). The study summarized the most credible research on breastfeeding outcomes for



infants and mothers and presented the data in terms of reduction in risk of disease development. The data shows that ever breastfeeding can give an infant a health advantage over an infant that was never breastfed. However, the majority of benefits are acquired after at least 3 months of breastfeeding and the risk of developing these diseases is inversely related to breastfeeding duration.

The main reason for the decline in breastfeeding in the 20<sup>th</sup> century was the creation of alternative infant feeding or formula feeding (Institute of Medicine [IOM], 1991). Formula feeding created an ideal of convenience that breastfeeding didn't provide and the cost of formula was soon overlooked (Fomon, S. 2001). Infant formula has advanced due to major discoveries that led to detailed formula requirements, but formula still isn't nutritionally identical to breast milk. The nutritional gap between formula and breast milk has been evident for some time now, but increasing the amount of women breastfeeding for a longer duration has made slow progress. This suggests that there are multiple factors that are contributing to women's decisions to stop breastfeeding, other than purely nutritional benefits.

Near the mid-20<sup>th</sup> century, United States (U.S.) breastfeeding rates had dropped dramatically (Fomon, S., 2001). Sometime around 1970, the breastfeeding rates began to rise, but the U.S. still hasn't recovered to acceptable rates. The Healthy People 2020 goal for infants ever breastfed is set at 82% (U.S. Department of Health and Human Sciences, [USDH] 2011). According to the CDC's 2011 Breastfeeding Report Card approximately 75% of U.S. mothers ever breastfed their infant, but only approximately 44% of those women still breastfeeding at 6 months. Only a third of those 75% of women that initiated breastfeeding were breastfeeding at 12 months (24%). Oklahoma would rank 38 in the U.S. if states were ranked from highest to lowest (State Health Facts, 2008). In 2011, Oklahoma was 8% behind the national average for breastfeeding initiation and 5% behind the national average for breastfeeding at 12 months.

Increased breastfeeding initiation rates are encouraging, but most of the benefits of breastfeeding aren't achieved until after at least 3 months of breastfeeding. In 2011, the U.S. saw a 30% decrease between breastfeeding at birth to breastfeeding at 6 months (CDC Breastfeeding Report Card, 2011). This shows that the current problem is not initiation, but rather sustaining breastfeeding practices. In 2011, Surgeon General Dr. Regina Benjamin decided on a call to action to promote breastfeeding (USDH, 2011). Benjamin said that this particular call was made to reiterate the importance and responsibilities of, "clinicians, employers, communities, researchers, and government leaders," to advocate and support mothers to breastfeed to the recommended goals (USDH, 2011 pg. v). The American Academy of Pediatrics (2012) also released an updated policy statement that reaffirms the recommendations and benefits that were assessed in the 2005 policy statement. However, the AAP stated that because of the medical and neurodevelopment benefits breastfeeding should be, "considered a public health issue and not only a lifestyle choice." (AAP, 2012 pg. e827). In order for the nation to reach the Healthy People 2020 goal, breastfeeding duration for 12 months will have to increase by 10% and breastfeeding at 6 months will have to increase by 20% (USDH, 2011; CDC, 2011).

The duration rates should be considered more critically than initiation rates because infants need to be breastfed for an extended period of time to receive the full benefits breastfeeding provides. There are at least two contributing factors associated with breastfeeding termination, demographics and personal reasons. Demographics of women that are more susceptible to decreased initiation rates and increased breastfeeding termination before 12 months have been identified. Women that are young, unmarried, less educated, poorer, participate in the Women Infants and Children Supplemental Feeding Program(W.I.C.), and have only one child are more likely to stop breastfeeding before the recommended time (Li, 2008). The reasons for these demographic differences are not consistent from state to state (CDC, 2010). Many studies have examined the initial obstacles to successful breastfeeding, but there are fewer studies

looking at the obstacles after the first 3 months of breastfeeding (Ahluwalia, 2005; Wilhelm, 2010).

As of now, many women don't continue to breastfeed after the first few months, thus the majority of breastfeeding termination research is conducted within the first few months of breastfeeding. In these existing surveys, many of the reasons for breastfeeding termination have to do with breastfeeding mechanics such as positioning and latch on (Ahluwalia et al., 2005). These initial breastfeeding obstacles could be prevented in the hospital, post delivery, or at home by nursing or lactation consultant intervention (Lewallen et. al, 2006). From studies that have had a large number of women who have breastfed for more than 3 months, *insufficient milk supply* and *the mother felt as if breast milk was not satisfying the infant* are more common reasons for termination (Li, 2008). The increased number of women returning to work after 3 months is also a large contributor (Ahluwalia, 2005). In regards to this topic, the U.S. is one of only four countries that do not have a national policy for paid maternity leave (USDH, 2011). Breastfeeding duration rates have the potential to increase if health care providers, along with communities and employers, understand what obstacles arise after the first few months of breastfeeding and are able to educate women on how to overcome these obstacles.

### **Research Questions**

The results of this study intend to contribute to the small percentage of studies that are done on women who have successfully breastfed for more than 3 months and will contribute information that will aid in creating interventions to overcome the identified obstacles. The questions the research is aiming to answer are:

1. In a sample of successful breastfeeding women, which women, based on demographics, are more susceptible to terminating breastfeeding before 9

months? Some factors examined will be ethnicity, socioeconomic status, and W.I.C. participation.

2. Are there infant characteristics that contribute to this termination? For example, are women with male infants more likely to quit early?
3. What are some of the reasons why women who successfully breastfed for 3 months stopped? Also, what are their opinions on why other women quit before 3 months, what physicians and communities can do to help support breastfeeding, and where did they receive most support for their breastfeeding decisions?

Demographic data to address question 1 and 2 were collected from a questionnaire filled out by mothers of 3 month old infants from a previous study entitled: Maternal and Dietary Nutrients and Neurotoxins in Infant Cognitive Development. The study had a final participant total of 131 women. The questionnaire consists of questions about ethnicity, family size, education level, and involvement in any outside program, such as W.I.C. To be included in the study, mothers had to be predominately breastfeeding their infant at 3 months.

Of the 131 women, 121 were sent an on-line survey now that their infants are 2 to 4 years of age; 10 participants did not provide valid email addresses. The survey listed 21 common reasons why women stop breastfeeding derived from a list of reasons that were categorized into different breastfeeding factors (Li et al, 2008). For example, breastfeeding termination may be associated with lactation factors, psychosocial factors, nutritional factors and lifestyle factors among other factors. Participants were asked to indicate if each reason contributed not at all, a little, somewhat, or a lot to their decision to stop breastfeeding. The survey also asked the women for the age of the child when they totally stopped breastfeeding as well as their opinion on why breastfeeding duration rates are low and what health care providers and communities can do to

help women to breastfeed longer. The Qualtrics survey and database management software system was used to distribute and collect answers to the survey.

The sample population from which the survey is being collected is predominantly white, has some college education, and is ranked in a middle-income level. The important variable is that all of these women were successfully breastfeeding at 3 months. All of the women stopped breastfeeding on their own and at different times, but they all overcame early breastfeeding obstacles. The answers to the survey should give some insight to the obstacles that occur after 3 months of breastfeeding.

### **Research Purpose**

The Healthy People 2010 goals for breastfeeding initiation were met but initiating isn't enough (CDC, Breastfeeding Report Card, 2010). The AAP recommends exclusive breastfeeding for 6 months and breastfeeding supplementation up to 12 months (AAP, 2005). Since there is a lower percentage of women breastfeeding for 6 and 12 months, research on the reasons why women stop breastfeeding is important for the health of all infants. In many studies, researchers evaluate the reasons why women stop breastfeeding within the first few months of initiation and most of the reasons are related to the mechanics of breastfeeding (Ahluwalia et al., 2005). There are fewer studies that evaluate the reasons why women stop breastfeeding after they've already been successfully breastfeeding for a period of time. This study plans to evaluate why women stop after successfully breastfeeding for 3 months. Since longer breastfeeding durations will be more beneficial to the infant and mother, as well as possibly cut health care costs, this information is invaluable. The health of all future Americans can depend on health care providers', communities', and activists' ability to educate women on how to breastfeed for longer by avoiding the obstacles that these women have identified.

## CHAPTER II

### LITERATURE REVIEW

#### **History of Breastfeeding and Infant Formula**

Breastfeeding used to be the only infant feeding practice known. However, during the twentieth century infant feeding practices underwent a huge change in the U.S. and the rest of the world (Institute of Medicine [IOM], 1991). Before the twentieth century breastfeeding initiation and duration rates were acceptably high. In the early years of the twentieth century there was an increase in knowledge and practice of general sanitation and dairying which began the shift towards alternative infant feeding (Fomon, 2001).

The first signs of infant, “formulas,” or artificial feeding came from within the home (Fomon, S. 2001). An early practice of using milk of other mammals was popular, but also resulted in high infant mortality rates (Barness, 1987). This failure led to the occupation of a wet nurse, or another woman hired to breastfeed the infant. This occupation began to fade during the industrial revolution when women could work in the factories for more money. By the 1900’s, whole cow’s milk or, “top milk,” was also used as an infant formula supplementation. The, “top milk,” was used because it was shown to be more easily digestible to the infant. While many women were practicing formula supplementation at home, in the early years of the 20<sup>th</sup> century physicians were creating formulas to evenly distribute nutrients for alternative infant feeding methods.

The first indications of scientific infant formula came from the physician adopted, “percentage method,” or the, “American Method” (Fomon, 2001). Both methods were based on a series of calculations and ratios of protein, fat, and carbohydrates. The main goal was to create a formula that was close to the composition of human milk while also considering the infant’s ability to digest certain compounds. Most of the scientific infant formulas were made in commercial plants because of the complexity which also meant they were less susceptible to contamination and more nutritionally complete than home-made formulas. Unable to have access to or the financial means to purchase manufactured infant formula, women in rural areas and those with a lower economic status continued to make infant formulas at home. By 1912 the infant formula feeding rate had increased with the introduction of clean milk, as well as rubber nipples and iceboxes to store cold milk. By the 1920s manufactured formulas had become increasingly popular, but varied in total energy density. Further research into vitamins and minerals in the infant body suggested that simple deficiency diseases, such as infant scurvy and rickets could be prevented by increased vitamin and mineral consumption; thus there was an increased emphasis on adding vitamins and minerals to infant formulas. Although scurvy and rickets were recognized in adults much earlier, the relation between the adult and infantile deficiencies was slowly recognized. Due to the recognition of infantile scurvy, the introduction of fruit juices decreased the use of boiled milk in infant formula. As America began to grasp the science behind the composition of infant formula, the use of these formulas increased.

Between 1930 and 1970 there was a large increase in the use of infant formulas, home or commercially made (Fomon, 2001). Home mixed formulas consisted of evaporated milk with water and a carbohydrate, most commonly corn syrup. Beginning in 1951, commercially condensed liquids were introduced to the food service market and began to replace powdered formulas. Convenience began to surpass the cost hesitations that were once present in the early introductions of commercial formula. This caused infant formula sales and usage to increase

dramatically. In 1959, powdered formulas became almost non-existent after the introduction of iron-fortification in the liquid formulas. This movement was also influenced by formula marketing and pediatrician recommendations. By now, infant formula increased substantially in popularity and the rates of breastfeeding had dropped drastically.

The statistics show that 77% of infants born between 1936 and 1940 were reported as breastfed, in the subsequent decades the number of infants breastfed declined to 25% by 1970 (IOM, 1992). Duration of breastfeeding rates also dropped from an average of 4.2 months in the early 1930s to 2.2 months in the later 1950s. This decline began to turn around in the 1970s. The reasons for the increase in breastfeeding around this time are not clear, but there was a public shift towards breastfeeding after formula companies began to acquire a bad reputation from negative publicity (Fomon, 2001). They were accused of interfering with breastfeeding in less developed areas due to aggressive marketing. There were also incidences of vitamin and mineral deficiencies in formula-fed infants.

Shortly after the FDA regulations were created in the 1950s, there was a pyridoxine (vitamin B-6) deficiency outbreak (Fomon, 2001). This was followed by a chloride deficiency in formula-fed infants in the 1970s. The FDA regulations were modified a number of times, but after seeking recommendation from the AAP, the final regulation was published in 1971. This regulation required all infant formulas to have a minimum concentration of protein, fat, and linoleic acid as well as 17 vitamins and minerals (FDA, 2006). As of now, under the Federal Food, Drug, and Cosmetic Act, infant formulas have defined nutrient specifications. The specifications say that each infant formula has to have minimum amounts of 29 nutrients. There are also maximum amount specifications for nine of the 29 nutrients

This increasing complexity and the modifications made to infant formulas could have concerned mothers; thus making breastfeeding the more cautious and adequate feeding practice.



Many studies show a steady increase in breastfeeding initiation starting in the 1970s (Ryan, 1997). Initiation rates rose from 28% ever breastfed infants 1971 to approximately 62% in 1982. After a slight decline in the years following 1982, there was a 14% increase in initiation rates between 1989 and 1995. The U.S. is still challenged to return to the breastfeeding rates common in the 1930s.

### **United States Breastfeeding Goals**

The Healthy People 2020 goal for infants ever breastfed is set at 82% (U.S. Department of Health and Human Sciences, [USDH] 2011). According to the CDC's 2012 Breastfeeding Report Card, approximately 77% of U.S. mothers ever breastfed their infant, but there are only approximately 47% of those women still breastfeeding at 6 months. About one third of the 77% of women that initiated breastfeeding were breastfeeding at 12 months (26%). This shows that the current problem is not initiation, but rather sustaining breastfeeding practices. Ranking states from highest to lowest dependent on breastfeeding initiation rates, Oklahoma ranks 38th (State Health Facts, 2008). In 2011, Oklahoma was 8% behind the national average for breastfeeding initiation and 5% behind the national average for breastfeeding at 12 months.

In 2011, Surgeon General Dr. Regina Benjamin decided on a call to action to promote breastfeeding. Benjamin said that this particular call was made to reiterate the importance and responsibilities of, "clinicians, employers, communities, researchers, and government leaders," to advocate and support mothers to breastfeed to the recommended goals (USDH, 2011 pg. v). The AAP also released an updated policy statement that reaffirms the recommendations and benefits that were assessed in the 2005 policy statement. However, the AAP stated that because of the medical and neurodevelopment benefits breastfeeding should be, "considered a public health issue and not only a lifestyle choice" (AAP, 2012 pg. e827). In order for the nation to reach the Healthy People 2020 goal, breastfeeding duration for 12 months will have to increase by 10% and

breastfeeding at 6 months will have to increase by 20% (USDH, 2011; CDC, 2011).

Breastfeeding initiation rates are encouraging, but most of the benefits of breastfeeding aren't achieved until after at least 3 months of breastfeeding (Ip *et al*, 2007).

### **Breastfeeding Benefits**

Human breast milk is, "species specific," meaning it makes breastfeeding superior to any other infant feeding method, and any alternate feeding methods must be compared to or referenced to breastfeeding practice. The recommendation for the duration of breastfeeding is 12 months; exclusive breastfeeding for 6 months is optimal and is defined as the infant only receiving breast milk without any addition of food or drink, not even water (World Health Organization, [WHO] 2011). It is also recommended that after breastfeeding has been established, infants be fed 8-12 times in a 24 hour period; on average every 2.5 hours (AAP, 2005.).

Increased research has allowed the American Academy of Pediatrics to update a previous policy statement outlining the benefits of breastfeeding to the infant and mother, as well as the community (AAP, 2012). The health benefits to a breastfed infant include decreased risk of bacterial infections such as meningitis, respiratory-tract infections, and sepsis. Some studies in adults and older children that were breastfed compared to those that were not breastfed show lower incidences of type 1 and type 2 diabetes, obesity, leukemia, and asthma. There is also evidence that breastfeeding is associated with slightly higher cognitive development in infants. Breastfeeding has shown maternal benefits in decreased menstrual blood loss, increased child spacing due to lactation amenorrhea, increased rate of return to pre-pregnancy weight, and decreased risk of breast and ovarian cancer. Breastfeeding rates have also been shown to influence and benefit the community, economically and environmentally, within each specific family unit. Benefits to the family unit include decreased family income loss associated with

increased employee attendance, and more time for other sibling attention due to decreased infant illness. Environmentally breastfeeding cuts down on formula can and bottle feeding waste, as well as decreased energy costs associated with production of formula or alternative feeding.

### **Infant Benefits**

In 2007, the Agency for Healthcare Research and Quality (AHRQ) evaluated the short-term and long-term effects of breastfeeding on maternal and infant health in developed countries (Ip *et al.*, 2007). The study summarized the most credible research on breastfeeding outcomes for infants and mothers and presented the data in terms of reduction in risk of disease development. In infants that were breastfed exclusively for 3-6 months, there was a 50% decreased risk of developing otitis media compared to exclusively formula fed infants. Non-specific gastrointestinal infection risks were decreased by 64% in infants that were breastfeeding. Infants who were exclusively breastfed 4 months or longer had a 72% reduced risk of hospitalization due to lower respiratory tract diseases. There was also found to be a 4% reduction in risk of obesity in adolescence and adulthood for each month an infant was breastfed. Other literature also supports breastfeeding providing protective effects against atopic dermatitis, asthma, cardiovascular disease, type 1 and 2 diabetes, childhood leukemia, infant mortality, and sudden infant death syndrome (AAP, 2005). This data shows that ever breastfeeding can give an infant a health advantage over an infant that was never breastfed. However, the majority of these benefits are acquired after at least 3 months of breastfeeding and the risk of developing these diseases is inversely related to breastfeeding duration.

### **Maternal Benefits**

Maternal benefits have also been identified including decreased menstrual blood loss, returning to a pre-pregnancy weight at a faster rate, and a decreased risk of breast and ovarian cancer (AAP, 2005). In the AHRQ analysis, there was a 4-12% decrease in risk of developing

type 2 diabetes for every month that the mother was breastfeeding, in the absence of gestational diabetes (Ip *et al.*, 2007). There was a 12% decreased risk for developing breast cancer for women that breastfed for 12 months or longer and there was also a 21% reduced risk for ovarian cancer in women who ever breastfed compared to never breastfeeding.

### **Health Care Costs**

Benefits of breastfeeding infants have also been linked to a potential decrease in medical expenses. Studies have been done on the amount of pediatric health care costs that are directly related to diseases that have decreased risk of occurrence in a breastfed baby. One analysis of past data (2005 CDC data and using 2007 dollars) done by Bartick and Reinhold (2010) looked at the health care costs and the prevalence of 10 diseases that showed a decrease in relative risk by breastfeeding duration. The analysis discovered that if 90% of U.S. families complied with the recommendation to exclusively breastfeed for 6 months then pediatric healthcare costs could be decreased by \$13 billion per year and 911 infant lives would be saved. Premature death was found to be the largest health care cost. Costs for otitis media, atopic dermatitis, and childhood obesity were also substantial. In addition to pediatric childhood obesity costs, adult obesity costs could also potentially decrease. 80% of people who are obese as children are obese in adulthood (Bartick, Reinhold, 2010). Subsequently, a similar analysis, done in 2011, found that if 90% of mothers complied with current medical recommendations then the U.S. would spend \$3.94 billion less per year on infant formula (Bartick, 2011). The health care costs cited do not even include the billions of dollars that could be saved with decreased rates of breast and ovarian cancer associated with breastfeeding. If breastfeeding rates increased, the evidence shows that health care costs can decrease. According to these statistics, breastfeeding has become more than just a health issue; it's become an economic issue.

### **Factors Associated with Breastfeeding Initiation and Duration**

## **Demographics**

Specific maternal characteristics have been found to be associated with early breastfeeding termination. In a review of research literature, women that are young, unmarried, less educated, poorer, participate in W.I.C., and have only one child are more likely to stop breastfeeding before the recommended time (Li , 2008). Younger age, lower education level, and lower income are found in many studies to show a consistent negative relationship to breastfeeding duration (Ahluwalia, 2005; Hendricks, 2006). An analysis of national breastfeeding rates conducted by the CDC found that only 32.7% of W.I.C. participants were breastfeeding at 6 months. Only 65% of women with high school educations initiated breastfeeding while initiation among college graduates was 85.4%. The number of women breastfeeding and breastfeeding duration also increased as age increased (CDC, 2010).

## **Ethnicity and Geographic Location**

Ethnicity and geographic location play large roles in the duration of breastfeeding (Li, 2005). In one study, non-Hispanic white mothers are less likely to initiate breastfeeding than Hispanic mothers. In comparison to 13.8 % of Hispanic mothers and 14.6% of non-Hispanic white mothers, only 5.4% of non-Hispanic black mothers were exclusively breastfeeding at 6 months. In the same study, mothers living in the Pacific, Mountain, and Northwest regions of the U.S had the highest rates of breastfeeding initiation, duration, and exclusivity. The lowest rates came from the East and South-Central (which includes Oklahoma) regions. Also foreign-born women living in the U.S. are 5 to 6 times less likely to continue breastfeeding for an extended period of time compared to women born in the U.S. (Bonuck, 2005).

## **Father's Role in Breastfeeding**

The father's role in the breastfeeding support team has been an increasingly popular research topic in breastfeeding initiation and duration. Although a father's ability to help feed a

breastfeeding infant is limited, many studies suggest that support in others ways is positively associated with breastfeeding initiation and duration (Sharma, 1997; Rempel, 2010; Arora, 2000). Initiation rates are highly associated with the father's attitude towards breastfeeding (Sharma, 1997). One of the most common reasons bottle feeding was chosen was due to the mother's perception of the father's attitude (Arora, 2000). Paternal support has also been positively associated with increased duration (Rempel, 2010). A literature review published by the American Dietetic Association found that lack of support from the father was negatively associated with breastfeeding intention (Sharma, 1999). The review also found that fathers influenced and were involved in the decision making to breastfeed. Paternal support has also been positively associated with increased duration due to the positive attitudes towards breastfeeding (Rempel, 2010). Increasingly research has shown that fathers do play a very important role in the infant feeding decision as well as duration (Sharma, 1997). Some researchers have suggested educational programs for the father to help them understand the difference they can make in the health of their infants.

### **Infant Characteristics**

Something that has been less studied is infant characteristics that are associated with early breastfeeding termination. Hendricks et al. (2006) conducted an analysis of the 2002 Feeding Infants and Toddlers Study which evaluated women that followed the AAPA feeding guidelines for infants aged 4 to 24 months. Children who received W.I.C. benefits and were enrolled in daycare were less likely to be breastfed at 6 months. First born child was positively associated with initiating breastfeeding and infant gender as female was positively associated with breastfeeding at 12 months; both were borderline significant however. In a different study, there were a slightly smaller percentage of male and first born children ever breastfed compared to female and not first-born children (Li, 2005). Interestingly, there was a study conducted in Australia, which is similar to the previously mentioned studies that found a significant difference

between breastfeeding duration and infant gender (Scott, 1999). They found that women who gave birth to male infants were more likely to stop breastfeeding at any time than women who gave birth to female infants. Oklahoma PRAMS data shows a difference in breastfeeding duration in association with infant birth weight. Infants with very low or low birth weight were less likely to breastfeed for a longer time (> 8 weeks) compared to infants with normal to high birth weight.

### **Reasons for Termination**

What are some of the *reasons* for terminating breastfeeding before 12 months? A questionnaire surveyed 1323 women who participated in the Infant Feeding Practice Study II (Li, 2008). They asked the women to rate 32 reasons from most important to least important in determining their reasoning for terminating breastfeeding within the first 12 months. The study found that some reasons for breastfeeding termination were dependent on the age of the infant at weaning. However, there were 4 consistent reasons that were cited as why women stopped breastfeeding before 12 months: 1.) perception that the breast milk alone wasn't satisfying the baby; 2.) wanting to begin a weight loss diet; 3.) wanting to return to their pre-pregnancy diet; and 4.) inability to feed the infant because the mother was not present due to instances other than work. In a study that used PRAMS data to analyze breastfeeding termination, women cited inadequate milk supply and infant dissatisfaction with breast milk alone most frequently as to why they stopped breastfeeding (Ahluwalia, 2005). The latter study was conducted over a 4 week period, but it gives insight into the early breastfeeding barriers. In a study conducted in Australia women cited, someone else being able to feed the infant, as their number one reason for not breastfeeding (Scott, 1999). In the same study, one of the factors associated with prolonged duration was the father's preference for or opinion of breastfeeding. Meaning, if the father supported and preferred breastfeeding, women were more likely to breastfeed longer. These findings suggest that there are many contributing factors to the reasons why women stop

breastfeeding, and that social support may be more important to breastfeeding success than we think.

The top reasons that have been cited by women for stopping breastfeeding before 12 months are: insufficient milk supply, the baby was not satisfied with milk alone, wanting to begin a weight loss diet, and return to work or school (Li, 2008; Ahluwalia, 2005). One study analyzed reasons why women stopped breastfeeding depending on the age of the infant (Li, 2008) The 3 most common reasons women stopped breastfeeding in the first and second months are: “Baby had trouble suckling and latching on, breast milk alone did not satisfy my baby, and I didn’t have enough milk” (Li, 2008, pg. S71). The main reasons cited between 3 and 8 months were: infant’s lack of satisfaction in breast milk alone and perception that the mother wasn’t producing enough milk continued to be important. “My baby lost interest in nursing and began to wean himself/herself,” became the third reason mentioned (Li, 2008, pg. S71). After 9 months the top three reasons mentioned are: “Breast milk alone did not satisfy my baby, my baby began to bite, and my baby lost interest in nursing or began to wean him or herself” (Li, 2008, pg. S71). Perception that the infant was not satisfied with breast milk alone was a consistent reason in all 3 age groups. Although the reasons why women stop breastfeeding are heavily studied, the time frames in which these women are surveyed are not consistent.

### **Breastfeeding Promotion**

Surgeon General Regina Benjamin M.D. has issued a *Call to Action* to help promote breastfeeding and ultimately the health of the country’s mothers and their children. She declared that the time has come for, “clinicians, employers, communities, researchers, and government leaders and to urge us all to take on a commitment to enable mothers to meet their personal goals for breastfeeding” (USDH, 2011, p 9). The ongoing efforts of the government program W.I.C. have been exceptionally helpful in promoting breastfeeding efforts. The W.I.C. program has



special meal plans available for mothers who are exclusively breastfeeding for 6 months which includes a larger amount of food for the breastfeeding mother (USDA Food and Nutrition Service (FNS), 2009). W.I.C. also provides education and peer support for new mothers that have decided to breastfeed. W.I.C. is used as an avenue to promote the USDA National Breastfeeding Campaign aims to increase the number of W.I.C. participants breastfeeding, refer other mothers to breastfeed, and increase public awareness and acceptance (U.S. Breastfeeding Committee (USBC), 2012). Although W.I.C. is one of the most popular governmental programs promoting breastfeeding, its funding was cut by a little over one million dollars between 2011 and 2012 (USDA FNS, 2011, 2012).

### **Summary**

The number of mothers that initiate breastfeeding is growing and initiation rates have met the previous public health goal (CDC, Breastfeeding Report Card, 2011). However, there is increasing evidence that indicates the benefits of breastfeeding are not fully realized until the infant has been breastfed for more than 3 months (AHRQ, 2011). Breastfeeding rates suffered in the mid 1900's and the U.S. is still trying to catch up to the rates that existed before the creation of infant formula. With the Healthy People 2020 goal in place, the government and the country is striving to increase breastfeeding rates for all women, but the needs of U.S. mothers need to be better understood.

There are suggestions in the literature that indicate some common struggles women who are breastfeeding share. Demographic characteristics show which women are less likely to not breastfeed or to stop after a few months, but the reasons behind why women decide to stop breastfeeding are less clear. Although initiation rates are important, increased breastfeeding duration is needed to supply the maximum benefits to the infants and their mothers. Because breastfeeding practice differs between regions, it is likely that reasons for discontinuing breastfeeding are also related to geographical location and regional social norms. Understanding

these reasons why women stop breastfeeding are the key to developing new education strategies in order to help more women overcome or avoid obstacles that will weaken their will to breastfeed.

## CHAPTER III

### RESEARCH ARTICLE

#### **Background**

##### **Breastfeeding Benefits**

Breast milk is, “species specific,” to human infants. It is what infants were designed to consume and all other infant feeding practices are inferior to the nutritional content of breast milk (American Academy of Pediatrics (AAP), 2005). Breastfeeding has been shown to decrease the risk of bacterial infections in infants and delay adult onset health issues. In 2007, the Agency for Healthcare Research and Quality (AHRQ) evaluated the short-term and long-term effects of breastfeeding on maternal and infant health in developed countries (Ip et al., 2007). The study summarized the most credible research on breastfeeding outcomes for infants and mothers and presented the data in terms of reduction in risk of disease development. In infants that were breastfed exclusively for 3-6 months, there was a 50% decreased risk of developing otitis media compared to exclusively formula fed infants. Infants who were exclusively breastfed 4 months or greater had a 72% reduced risk of hospitalizations due to lower respiratory tract diseases. Non-specific gastrointestinal infection risks were decreased by 64% in infants that were breastfeeding compared to non-breastfeeding infants. There was also a 4% reduction in risk of obesity in adolescence and adulthood for each month an infant was breastfed. Other literature also supports breastfeeding providing protection against atopic dermatitis, asthma, cardiovascular disease, type

1 and type 2 diabetes, childhood leukemia, infant mortality, and sudden infant death syndrome (AAP, 2005). While these data show that a breastfed infant has a health advantage, the majority of these benefits are acquired after at least 3 months of breastfeeding and the risk of developing these diseases is inversely related to breastfeeding duration.

### **United States Breastfeeding Action and Goals**

In 2011 Surgeon General Dr. Regina Benjamin decided on a call to action to promote breastfeeding to reiterate the importance and responsibilities of, “clinicians, employers, communities, researchers, and government leaders,” to advocate and support mothers to breastfeed to the recommended goals (U.S. Department of Health and Human Sciences, [USDH], 2011 pg. v). The American Academy of Pediatrics also released an updated policy statement that reaffirms the recommendations and benefits in the 2005 policy statement. However, the AAP stated that because of the medical and neurodevelopment benefits, breastfeeding should be, “considered a public health issue and not only a lifestyle choice.” (AAP, 2012 pg. e827).

The Healthy People 2020 goal for infants ever breastfed is set at 82% (USDH, 2011). According to the Center for Disease Control’s (CDC) 2011 Breastfeeding Report Card approximately 75% of U.S. mothers ever breastfed their infant, but only approximately 44% of women are still breastfeeding at 6 months. Less than half of the 75% of women that initiated breastfeeding were breastfeeding at 12 months (24%). Oklahoma ranks 38<sup>th</sup> in breastfeeding initiation (State Health Facts, 2008). This shows that the current problem is not just initiation, but rather sustaining breastfeeding practices.

### **Factors Associated with Decreased Duration**

Duration rates should be considered more critical than initiation rates because infants need to be breastfed for an extended period of time to receive the full benefits breastfeeding provides. There are at least two contributing factors to breastfeeding termination, namely,

demographics and personal reasons. The common demographic trends that are associated with decreased breastfeeding are: lower education and income level, lower age, W.I.C. participation, and geographical location (Li, 2005). An analysis of national breastfeeding rates conducted by the CDC found that Black non-Hispanic mothers had the lowest rates of initiation at 55.4% while Hispanics had the highest initiation rates at 80% (CDC, 2010).

### **Reasons for Termination**

Many studies have examined the initial obstacles to successful breastfeeding, but there are fewer studies looking at the obstacles faced after the first 3 months of breastfeeding (Ahluwalia, 2005; Wilhelm, 2010). The top reasons that have been cited by women for stopping breastfeeding during the first year are: insufficient milk supply, the baby was not satisfied with milk alone, wanting to begin a weight loss diet, and return to work or school (Li, 2008; Ahluwalia, 2005). One study analyzed reasons why women stopped breastfeeding depending on the age of the infant (Li, 2008). The 3 most common reasons women stopped breastfeeding in the first and second months are: “Baby had trouble suckling and latching on, breast milk alone did not satisfy my baby, and I didn’t have enough milk” (Li, 2008, pg. S71). Between 3 and 8 months, infant’s lack of satisfaction in breast milk alone and perception that the mother wasn’t producing enough milk continued to be important. “My baby lost interest in nursing and began to wean himself and herself,” became the third reason mentioned (Li, 2008, pg. S71). After 9 months the top three reasons mentioned are: “Breast milk alone did not satisfy my baby, my baby began to bite, and my baby lost interest in nursing or began to wean him or herself” (Li, 2008, pg. S71). Perception that *the infant was not satisfied with breast milk* alone was a consistent reason in all 3 age groups. Many of the reasons for early breastfeeding termination have to do with breastfeeding mechanics such as positioning and latch on. Researchers have suggested that these initial breastfeeding obstacles could be prevented by in hospital or at home nursing or lactation consultant intervention (Lewallen et. al, 2006). The number of women returning to work after 3

months is also a contributor to early termination (Ahluwalia, 2005). Breastfeeding duration rates have the potential to increase if health care providers, along with communities and employers, understand what obstacles arise after the first few months of breastfeeding and are able to educate women on how to overcome these obstacles to promote longer breastfeeding duration.

Something that has been studied less is infant characteristics that are associated with early breastfeeding termination. Hendricks et al. (2006) conducted an analysis of the 2002 Feeding Infants and Toddlers Study which evaluated women that followed the AAPA feeding guidelines for infants aged 4 to 24 months. Children who received W.I.C. benefits and were enrolled in daycare were less likely to be breastfed at 6 months. Being a first born child was positively associated with initiating breastfeeding and infant gender as female was positively associated with breastfeeding at 12 months; both were borderline significant. In a different study, there were a slightly smaller percentage of male and first born children ever breastfed compared to female and not first-born children (Li, 2005). Interestingly, a study conducted in Australia, (Scott, 1999) found women who gave birth to male infants were more likely to stop breastfeeding at any time than women who gave birth to female infants. Oklahoma PRAMS data shows a difference in breastfeeding duration in association with infant birth weight. Infants with very low or low birth weight were less likely to breastfeed for a longer time (> 8 weeks) compared to infants with normal to high birth weight.

### **Study Purpose**

The current study intends to contribute to the small number of studies that survey women who have successfully breastfed for more than 3 months. The questions the research is designed to answer are: 1.) In a sample of successful breastfeeding women, which women, based on demographics, are more susceptible to terminating breastfeeding before 9 months? Some factors examined were ethnicity, income, and W.I.C. participation. 2.) Are there infant characteristics

that contribute to this termination? For example, are women with male infants more likely to quit early? 3.) What are some of the reasons why these women who successfully breastfed for 3 months stopped? Also, women were asked their opinions on why other women quit breastfeeding before 3 months, what physicians and communities can do to help support breastfeeding, and where they received the most support for their breastfeeding decisions?

## **Methods**

### **Participants**

Women (n= 121) who had already participated in a previous research project entitled: *Maternal and Dietary Nutrients and Neurotoxins in Infant Cognitive Development* were asked to complete an additional online survey in October and November 2012. The total number of original study participants was 131, but 10 participants did not provide valid email addresses which led to 121 surveyed mothers. Of the 131 participants, only 109 participants remained in the study until their infants were 9 months of age. This group of 109 subjects was used to examine the relation between demographic factors and breastfeeding duration. These 109 subjects were grouped depending on the time they stopped breastfeeding: terminated when their child was between 3 and 6 months (Stopped 3-6), terminated between 6 and 9 months (Stopped 6-9), and those still breastfeeding at 9 months (BF 9 months). The maximum was categorized as breastfeeding at 9 months because mothers no longer came for research visits with their infants after 9 months in the original study. This study, as well as the original, one was approved by the Oklahoma State University Institutional Review Board.

### **Procedure**

The women were recruited for the original study through community fliers and through health networks such as the hospital or health department. The women had to be predominately breastfeeding (< 28 oz formula a week) their healthy full term infant (birth weight > 3 kg) at 3

months to be included in the study. In October 2012, 121 participants were sent a request to participate in an on-line survey now that their infants were 2 to 4 years of age. An initial survey notification letter was sent to the subjects describing the purpose of the survey. Participants were also notified that the survey was entirely voluntary and that by clicking on the link to begin the survey they were indicating they were fully informed about the study. Reminder e-mails were sent 2 weeks and 4 weeks after the initial notification. The survey took approximately 5-10 minutes to complete depending on the length of the participants' answers to the open ended questions. The Qualtrics survey software (Provo, Utah, <https://okstateches.qualtrics.com>) was used to distribute and collect answers to the survey. Survey responses were linked to the subject number from the original study to access longitudinal information for analysis. Survey responses were stored in a password protected Qualtrics control panel; access was only available to the lead researcher and advisor.

## **Survey**

The survey consisted of two parts: a quantitative section and a qualitative section. The Quantitative section included 21 statements describing why women stop breastfeeding derived from a survey conducted by Li *et al.* (2008). As the Li study was sponsored by the CDC, the survey is in the public domain. Reasons for stopping breastfeeding were divided into seven categories: lactational (2 questions), psychosocial (3 questions), nutritional (4 questions), lifestyle (4 questions), medical (3 questions), milk-pumping (2 questions), and self-weaning (3 questions). For instance, "I wanted to have someone else be able to feed my baby," is categorized under a psychosocial factor. The items, "returning to work/school, and "my significant other wanted me to stop" were added to the survey after pilot testing process because of comments from the pilot group and research suggesting that women cannot breastfeed longer than 3 months due to short, unpaid maternity leave (Guendelman et al, 2009).



The survey asked for the women to mark if the particular reason contributed, *not at all*, *a little*, *somewhat*, or *a lot* to their decision to stop breastfeeding. The women provided one response for each reason. Responses were given a score of 1-4; 1 being *not at all* and 4 being *a lot*. As some of the factors included more items than others, average group scores were computed to allow for comparison. For example, the responses to the items under the “nutritional factor” were added and divided by four. The resulting score is reported as a mean and standard deviation.

<b>Table 1-Questions Included in Each Factor of the Online-Survey</b>	
<b>Lactational Factor</b>	<b>Medical Factor</b>
My breasts became too large and engorged. My breasts started leaking too much.	My baby became sick and needed outside attention. I became sick and started taking medication. I became pregnant again.
<b>Psychosocial Factor</b>	<b>Milk-Pumping Factor</b>
Breastfeeding was becoming too inconvenient. I wanted to have someone else be able to feed my baby. Breastfeeding in public was becoming uncomfortable.	I didn't want to pump at work. Pumping was taking too much time and effort.
<b>Nutritional Factor</b>	<b>Self-Weaning Factor</b>
I started having trouble with my let down. My baby was gaining too much weight. My baby wasn't gaining enough weight. I wasn't making enough milk for my baby's needs.	My baby started biting after he/she got teeth. My baby lost interest in breastfeeding. My infant's age.
<b>Lifestyle Factor</b>	<b>Independent Factor</b>
I had to return to work/school. I wanted to start a weight loss diet. I wanted to start drinking alcohol again without having to worry. I wanted my body back to myself.	My significant other wanted me to stop.

Adopted from Li *et al.*, 2008 CDC survey

Qualitative Section: The survey also included four open-ended questions asking for participants' thoughts and opinions. The questions asked were 1) what are two main reasons why the majority of women stop breastfeeding before their infant is 3 months old, 2) what do you think healthcare providers can do to support breastfeeding until the infant is at least one year old, 3) what do you think society or the community could do to support continued breastfeeding, and 4) where did you get the most support for your decision to start and continue breastfeeding? These questions were included to give women a chance to express their own opinions on why women stop breastfeeding.

The survey results were exported from the Qualtrics database into an Excel spreadsheet. All open-ended question responses were analyzed individually. After reading the answers, categories were created and each answer was marked in the categories it mentioned; one answer could be marked for more than one category. Each category mark was added to determine the total number of times it was mentioned per question. Categories were then combined to create and report themes to each open-ended question. The primary investigator and advisor reviewed all the responses and developed the themes and the results were reviewed by two survey participants.

## **Demographics**

A demographic information questionnaire was provided to the mother when baby was 3 months of ages during their participation in the previous study. The demographic questionnaire was administered verbally. The questionnaire consisted of questions about ethnicity, family size, education level, and involvement in any outside program, such as W.I.C. During the on-line survey, women were asked to report the age of their infant, in months; when they completely stopped breastfeeding; or to indicate if they were still currently breastfeeding.

## Analysis

Frequencies and means were calculated using IBM SPSS Statistics version 19 (IBM, Armonk, New York) for all demographic variables and the quantitative survey responses. Chi-square and t-tests were used to compare the demographics of the original study group and the survey group. Chi-square and ANOVA analyses were used to explore the relation between demographics and stopping breastfeeding before 9 months. For the women responding to the survey who also reported when they stopped breastfeeding, correlation analysis compared the age of the infant and breastfeeding factors along. Additional correlations were computed between the breastfeeding factors. Significance was set at  $p < .05$ . Analysis of qualitative results was previously described.

## Survey Results

### Demographics

There were 131 subjects in the original study; Demographic information on this group is presented in **Table 2**. Out of the 121 women surveyed, 55 surveys were answered (45% response rate). A complete description of this sub-sample is also available in **Table 2**. Of the 131 women, the mean age was 28.8; 87.1% were white, 64.4% have a college degree or higher, and 90.2% were married. Slightly less than half (49.2%) of the women reported having a yearly income level over \$40,000, 43.6% received less than one year of state or government assistance, and 28% were participating in the W.I.C. program at the time of collection. The majority (76.2%) did not have a Cesarean section (C-section), 57.6% of the infants are female, and the mean birth weight was 3.47 kilograms. Mothers were also asked their perceptions on the health of their infant and 86.4% of mothers strongly disagreed that their child was less healthy than other children, while 18.5% of mothers disagreed that their child was never seriously ill.

<b>Table 2-Demographics of Original and Survey Participants</b>			
	<b>p-value</b>	<b>Original Group (n=131)(%)</b>	<b>Survey Group (n=55)(%)</b>
<b>Ethnicity</b>	0.671		
White		87.1	89.1
Hispanic		2.3	1.8
Native American		6.8	3.6
Asian		2.3	3.6
Black		1.5	1.8
<b>Education</b>	0.06		
High School Only		5.3	1.8
Some College		29.5	21.8
College Graduate		26.5	25.5
Post Graduate		37.9	50.9
<b>Marital Status</b>	0.805		
Married		90.2	90.9
Single		9.8	9.1
<b>Income Level</b>	0.166		
Under \$15,000		11.5	11.1
\$15,001-25,000		15.2	9.3
\$25,001-\$40,000		23.1	18.5
\$40,001-\$60,000		23.8	31.5
Over \$60,000		25.4	29.6
<b>Years Receiving Gov./State Assistance</b>	0.886		
Less than 1 year		43.6	35.7
1 year		17.9	21.4
2 years		10.3	14.3
3 years		2.6	-
4 years		10.3	14.3
5 or more years		15.4	14.3
<b>W.I.C. Participation</b>	0.87		
Yes		28	27.3
No		72	72.7
<b>C-Section</b>	0.743		
Yes		23.8	24.5
No		76.2	75.5
<b>Child Less Healthy Than Other</b>	0.212		
Strongly Agree		1.5	-
Agree		0.8	1.9
Disagree		9.1	13
Strongly Disagree		86.4	83.3

An independent t-test showed significance ( $p = 0.006$ ) in the surveyed mother's age revealing older mothers responded to the survey. A Pearson Chi-Square analysis was done comparing the 131 members of the original group and the 55 participant survey group on categorical variables as reported in the table. Additional analyses compared gender of child ( $p = 0.634$ ), number of children ( $p = 0.904$ ) and child never ill ( $p = 0.657$ ). The mother's education level approached significance ( $p = 0.06$ ) suggesting that a larger portion of higher educated women filled out the survey.

### **Association of Demographics and Breastfeeding Duration**

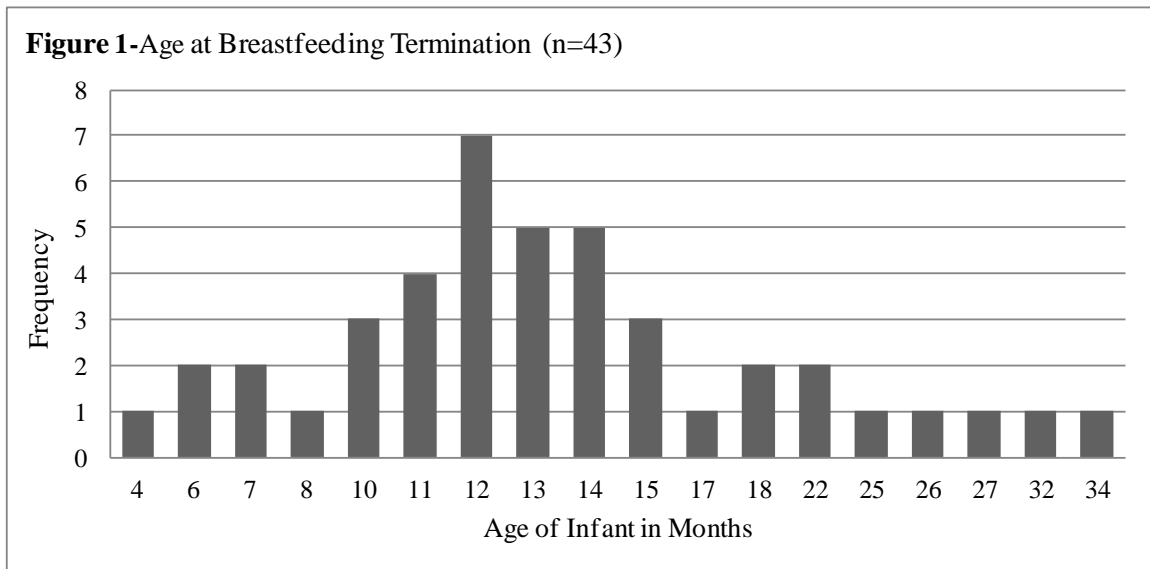
The women ( $n = 109$ ) were put into 3 breastfeeding groups depending on when they stopped breastfeeding: stopped 3-6 months ( $n = 16, 14.7\%$ ), stopped 6-9 months ( $n = 13, 11.9\%$ ) and BF at 9 months ( $n = 80, 73.4\%$ ). An analysis showed no significant difference between the breastfeeding groups regarding the mother's age (ANOVA,  $p = 0.885$ ) or infant gender (Chi square,  $p = 0.196$ ). There was also no significant difference between first born children compared to non-first born children in relation to breastfeeding duration (Chi square,  $p = .405$ ). A Chi-square analysis found that all the mothers that received unemployment ( $p = .003$ ) stopped breastfeeding before 6 months. In an ANOVA analysis there was a significant difference when a mother stopped depending on how many years she received state or government assistance ( $p = .043$ ). The women that stopped at 3-6 months had the lowest years of assistance. When the breastfeeding groups were collapsed into two groups, those who stopped when their child was between 3 and 9 months and those still breastfeeding at 9 months, there was a difference between income level (chi square  $p = .053$ ). Of women reporting incomes below \$60,000, 81% were still breastfeeding when their infants were 9 months of age, while only 52% of women reporting incomes over \$60,000 were continuing.

**Table 3-** Breastfeeding Group Comparison Using Chi-square Analysis  
(n=131)

	<b>p-value</b>	<b>Stopped 3-6 mo.(n)</b>	<b>Stopped 6-9 mo.(n)</b>	<b>BF at 9 mo.(n)</b>
<b>Ethnicity</b>	0.783			
White		14	13	69
Hispanic		0	0	2
Native American		1	0	6
Asian		1	0	1
Black		0	0	2
<b>Education</b>	0.696			
High School		0	1	3
Graduate Only				
Some College		6	1	23
College Graduate		5	5	19
Post Grad or Above		5	6	34
<b>Marital Status</b>	0.944			
Married		15	12	73
Single		1	1	7
<b>Income Level</b>	0.119			
Under \$15,000		2	1	9
\$15,001-25,000		2	1	13
\$25,001-\$40,000		2	2	19
\$40,001-\$60,000		4	1	24
Over \$60,000		5	8	14
<b>Years Receiving Gov./State Assistance</b>	0.367			
Less than 1 year		5	0	7
1 year		1	0	5
2 years		0	1	3
3 years		0	0	1
4 years		0	0	2
5 or more years		0	1	3
<b>Receiving Unemployment</b>	0.003			
Yes		2	0	0
No		14	13	80
<b>Energy Assistance</b>	0.053			
Yes		1	0	0
No		15	13	80
<b>WIC Participation</b>	0.379			
Yes		4	1	20
No		12	12	60
<b>Child Less Healthy Than Other</b>	0.052			
Strongly Agree		0	1	0
Agree		0	0	1
Disagree		1	1	9
Strongly Disagree		14	10	69

### Association with Extended Breastfeeding Based on On-line Survey

Of the 55 survey responses, 6 women were currently breastfeeding and 6 did not provide a response. The number of women that reported an age of their infant when they stopped breastfeeding was 43. The age of the infants when breastfeeding stopped ranged from 4-34 months; the average number of months women reported breastfeeding was 14.31 (**Figure 1**).



As reported in **Table 4**, the mean response for individual items and factors were usually less than 2 – indicating that this item influenced the women *not at all*. The self-weaning factor held the highest mean score at 1.91. The remaining mean scores did not exceed 1.5. In the survey, women were asked to mark whether a given reason contributed, *not at all*, *a little*, *somewhat*, or *a lot* to their decision to stop breastfeeding. *My infant's age* contributed *a lot* to 30.4% of the respondents; this was the highest percentage in the *a lot* column. *Breastfeeding was becoming too inconvenient* (26.8%) and *I wanted my body back to myself* (23.2%) were the highest percentages that contributed to the decision to stop *a little*. 100% of the respondents noted that *My baby was gaining too much weight* did *not contribute at all* to their decision to stop breastfeeding. *My breasts became too large and engorged*, *My breasts started leaking too much*,

*My baby wasn't gaining enough weight, I wanted to start drinking alcohol again without having to worry, and My baby became sick and needed outside attention* all were reported as 90% or above as contributing *a little*. The two questions included in the lactation factor, *My breasts became too large and engorged* and *My breasts started leaking too much*, both had less than 2% recorded in the contributing *a lot* column.

There was a positive correlation approaching significance between the perceived contribution of *my significant other wanted me to stop* and the age of the infant when breastfeeding stopped ( $r=0.294$ ,  $p=0.055$ ). There was significant negative correlation between the age of the infant and the nutritional factor ( $r= -0.403$ ,  $p=0.008$ ). The breastfeeding factors were also analyzed according to how old the infant was when breastfeeding stopped in 2 groups: breastfeeding stopped before 12 months and breastfeeding stopped after 12 months. T-test analyses found there was no significant difference between the groups means scores except for the nutritional factor. Women who reported stopping before 12 months gave a higher ranking to the nutritional factor compared to women who stopped after 12 months ( $p=0.003$ ). When the factors were correlated to each other, there was a significant positive correlation between the psychosocial and lifestyle factor ( $r=0.514$ ,  $p=0.00$ ) and a significant correlation between psychosocial factor and *my significant other wanted me to stop* ( $r=0.499$ ,  $p=0.001$ ). Nutritional factor and pumping factor were also significantly positively correlated ( $r=0.382$ ,  $p=0.013$ ). There was also no significant correlation of lactational factors to the infant's age when breastfeeding stopped ( $r= -0.143$ ,  $p= 0.368$ ). Self-weaning and medical reasons did not appear to be associated with any other factor.



**Table 4-Survey Responses (n=55)**

<b>Reasons for Stopping.</b>	<b>Mean ± Std. Dev.<sup>a</sup></b>	<b>Not at all (%)</b>	<b>A little (%)</b>	<b>Somewhat (%)</b>	<b>A lot (%)</b>
<b>Lactational Factor</b>	<b>1.11 ± 0.37</b>				
My breasts became too large and engorged.	1.13 ± 0.433	91.1	5.4	3.6	0
My breasts started leaking too much.	1.09 ± 0.482	96.4	1.8	0	1.8
<b>Psychosocial Factor</b>	<b>1.15 ± 0.64</b>				
Breastfeeding was becoming too inconvenient.	1.65 ± 0.886	55.4	26.8	12.5	5.4
I wanted to have someone else be able to feed my baby.	1.38 ± 0.680	71.4	16.1	12.5	0
Breastfeeding in public was becoming uncomfortable.	1.47 ± 0.813	69.6	17.9	8.9	3.6
<b>Nutritional Factor</b>	<b>1.29 ± 0.47</b>				
I started having trouble with my let down.	1.49 ± 0.960	76.8	5.4	10.7	7.1
My baby was gaining too much weight.	1.00 ± 0.000	100	0	0	0
My baby wasn't gaining enough weight.	1.05 ± 0.299	96.4	1.8	1.8	0
I wasn't making enough milk for my baby's needs.	1.69 ± 1.169	69.6	7.1	7.1	16.1
<b>Lifestyle Factor</b>	<b>1.36 ± 0.42</b>				
I had to return to work/school.	1.56 ± 1.050	73.2	5.4	10.7	10.7
I wanted to start a weight loss diet.	1.18 ± 0.580	89.3	5.4	3.6	1.8
I wanted to start drinking alcohol again without having to worry.	1.09 ± 0.290	91.1	8.9	0	0
I wanted my body back to myself.	1.63 ± 0.933	60.7	23.2	8.9	7.1
<b>Medical Factor</b>	<b>1.23 ± 0.38</b>				
My baby became sick and needed outside attention.	1.04 ± 0.189	96.4	3.6	0	0
I became sick and started taking medication.	1.24 ± 0.693	87.5	5.4	3.6	3.6
I became pregnant again.	1.45 ± 1.015	80.4	1.8	5.4	12.5
<b>Milk-Pumping Factor</b>	<b>1.11 ± 0.37</b>				
I didn't want to pump at work.	1.27 ± 0.622	78.6	16.1	3.6	1.8
Pumping was taking too much time and effort.	1.38 ± 0.757	73.2	16.1	7.1	3.6
<b>Self-Weaning Factor</b>	<b>1.91 ± 0.61</b>				
My baby started biting after he/she got teeth.	1.47 ± 0.879	71.4	14.3	8.9	5.4
My baby lost interest in breastfeeding.	1.91 ± 1.143	55.4	14.3	16.1	14.3
My infant's age.	2.31 ± 1.318	42.9	14.3	12.5	30.4
<b>Independent Factor</b>					
My significant other wanted me to stop.	<b>1.16 ± 0.53</b>	89.3	7.1	1.8	1.8

<sup>a</sup> Standard Deviation

**Table 5-Breastfeeding Factor Correlations Qualitative Results (n=55)**

		Infant age <sup>a</sup>	Significant Other <sup>b</sup>	Lactational Factor	Psychosocial Factor	Nutritional Factor	Lifestysyle Factor	Medical Factor	Pumping Factor	Self-Weaning Factor
Infant age <sup>a</sup>	<i>r</i>		0.294	-0.143	0.159	-0.403	0.075	0.163	-0.235	0.189
	<i>p</i>		0.055	0.368	0.314	0.008	0.635	0.303	0.134	0.232
Significant Other <sup>b</sup>	<i>r</i>	0.294		-0.066	0.499	-0.038	0.151	0.125	0.012	-0.001
	<i>p</i>	0.055		0.676	0.001	0.81	0.339	0.43	0.942	0.996
Lactational Factor	<i>r</i>	-0.143	-0.066		0.276	-0.164	0.164	-0.143	-0.055	0.046
	<i>p</i>	0.368	0.676		0.077	0.299	0.301	0.367	0.728	0.772
Psychosocial Factor	<i>r</i>	0.159	0.499	0.276		-0.08	0.514	-0.069	0.265	-0.141
	<i>p</i>	0.314	0.001	0.077		0.613	0.000	0.666	0.09	0.372
Nutritional Factor	<i>r</i>	-0.403	-0.038	-0.164	-0.08		0.175	0.241	0.382	-0.013
	<i>p</i>	0.008	0.81	0.299	0.613		0.268	0.124	0.013	0.934
Lifestysyle Factor	<i>r</i>	0.075	0.151	0.164	0.514	0.175		-0.159	0.151	-0.037
	<i>p</i>	0.635	0.339	0.301	0	0.268		0.316	0.341	0.815
Medical Factor	<i>r</i>	0.163	0.125	-0.143	-0.069	0.241	-0.159		-0.148	-0.159
	<i>p</i>	0.303	0.43	0.367	0.666	0.124	0.316		0.351	0.316
Pumping Factor	<i>r</i>	-0.235	0.012	-0.055	0.265	0.382	0.151	-0.148		0.179
	<i>p</i>	0.134	0.942	0.728	0.09	0.013	0.341	0.351		0.257
Self-Weaning Factor	<i>r</i>	0.189	-0.001	0.046	-0.141	-0.013	-0.037	-0.159	0.179	
	<i>p</i>	0.232	0.996	0.772	0.372	0.934	0.815	0.316	0.257	

*r* = Pearson Correlation

Significance set at  $p \leq 0.05$

<sup>a</sup> How old was your infant (in months) when you totally stopped breastfeeding?

<sup>b</sup> My significant other wanted me to stop.

### Why do you think women stop breastfeeding before 3 months?

When women were asked their opinions on why the majority of mothers stop breastfeeding before 3 months three common themes emerged: Inconvenience/Discomfort, Return to Work, and Lack of Support. Many women mentioned inconvenience was the main reason why women stopped breastfeeding. Responses emphasized how breastfeeding was a huge commitment and many women underestimate the amount of time and effort the act of breastfeeding takes. Inconvenience was commonly mentioned along with time consuming, difficulty, and lack of support. One response included, “*Women want to get back to a semblance of the schedule they had pre-baby. Breastfeeding takes TIME, especially if it isn't easy for you*”

*and/or your baby. I think we're very addicted to schedules and if bottle-feeding allows you to regain a schedule and breastfeeding doesn't, most women will feel drawn into bottle feeding.”*

Some responses also pointed to lack of support being the root cause of early breastfeeding termination. Whether it be support from family members, communities, or workplaces, support was very important. One woman described the relationship of inconvenience and support as, *“Breastfeeding is a major time commitment in the first few months, and many women lack the social support to support a healthy breastfeeding relationship.”* Another woman simply noted that one of the reasons women stopped was problems with breastfeeding, *“without help.”*

The majority of the women that discussed return to work also mentioned difficulty pumping; the two appeared very closely connected. Many women simply stated that, *“returning to work,”* was one of the main reasons women stopped breastfeeding before 3 months. Other women gave details of their work environments not supporting breastfeeding and discussed feeling guilty for not working more after returning. One woman rationalized that women stop breastfeeding because of, *“Difficulty being able to coordinate pumping while working. I would pump about 4 times a day at work and it would take 10-15 minutes. I felt guilt over missing parts of my job at times. My boss was supportive but I did not always feel support from fellow female employees.”* Others also felt their bosses and coworkers were uncomfortable or, *“resented the amount of time they spent away from their desks to pump.”*

**Table 6** -Frequency: What are two main reasons you think women stop breastfeeding before their infant is 3 months old? (n=55)

<b>Emerging Themes</b>	<b>Number of Times Mentioned</b>
Inconvenience	14
Return to Work	15
Pumping	13
Lack of Support	14

**What do you think health care providers can do to support breastfeeding until the infant is at least one year old?**

Next women were asked what they thought health care providers could do to support breastfeeding. An overwhelming majority of responses mentioned education, but many women wanted the health care providers to be more educated. Many responses mentioned health care providers needing to stress the benefits of breastfeeding, but women wanted more every day, “real life,” information. Some responses also criticized their health care providers for not being knowledgeable enough or refraining from breastfeeding discussions all together. Frequently women thought health care providers should just be more encouraging about breastfeeding. Others mentioned that health care providers should encourage breastfeeding only and should stop giving or receiving formula samples. Many women simply wanted to talk about the breastfeeding process with their health care providers: *“Talk more about it--the health benefits for your baby; that it is okay to do so in public; that it is okay to spend that time with your child; that it is okay to pump at work; etc;”* *“Enter into conversation about breast feeding and it's benefits more often with soon to be mothers and after baby is born.”*

However, some women just wanted to be told by their health care provider that they were doing a good job. One woman expressed health care providers just needed to, *“Provide enthusiastic support, information, & encouragement to pregnant women/mothers!”* Another response was to, *“Encourage people - let them know they appreciate the effort. Our pediatrician gave brief acknowledgement – but I never perceived her as a resource.”* The women also found lactation consultants helpful and thought they should be more available along with other resources to help with obstacles after they leave the hospital. Also physicians and physician offices just needed to recommend more resources for breastfeeding help during pregnancy and after the infant birth.

**Table 7-** Frequency: What do you think health care providers can do to support breastfeeding until the infant is at least one year old?

Emerging Themes	Number of Times Mentioned
Education	25
Encouragement/Empowerment	16
Resources/Lactation Consultants	14

**What do you think society or the community could do to support continued breastfeeding?**

Support for public breastfeeding and the community providing more private spaces to breastfeed were the two reoccurring themes in response to women being asked what communities could do to support breastfeeding. To support public breastfeeding was a broad theme, women mentioned accepting the action, the public being more exposed to breastfeeding, and making breastfeeding the standard. *“Make breastfeeding the “norm” and not treat mothers like outsiders for feeding their babies in public,” “Allow it to become the “normal” thing to do through education and candidness. This doesn’t mean we should post pictures on every billboard or social network site, but simply encouraging parents to educate their children in an age appropriate manner would support breastfeeding.”* Many women also mentioned that communities and society needed to stop sexualizing a woman’s breasts: *“Society needs to be re-educated in the purpose of a woman’s breasts: to feed their children! Women today seem to be uncomfortable with their bodies and view that their bodies are only used for sexual purposes (sad), and I think society and the community needs to change that view.”*

When discussing providing more private spaces for women to breastfeed in public, women simply wanted a designated space to breastfeed that wasn’t in a bathroom. Women gave details about how they would have to use bathroom stalls to breastfeed their infant: *“Have stalls in bathrooms for mothers who want to nurse. When I’m in public, I just nurse while sitting on a toilet. I know people get frustrated when I’m in there for so long though.” “Provide a private*

*room in a bathroom with an outlet and a comfortable chair (not a toilet!).” Another woman explained that she was forced to choose a bathroom floor or retreat to her car to breastfeed: “Provide private places for women to nurse a baby. A chair or bench in the ladies room or even bathrooms that have ACTUAL toilet lids would provide someplace. I don't know how many times I had to sit on a dirty bathroom floor in a restaurant or go sit in my car in the 100 degree heat because there was just no place I could go that wasn't distracting or too noisy for my baby.”*

**Table 8**-Frequency: What do you think society or the community could do to support continued breastfeeding?

<b>Emerging Themes</b>	<b>Number of Times Mentioned</b>
Support/Acceptance of Public Breastfeeding	35
More Private Areas to Breastfeed	19

**Where did you get the most support for your decision to start and continue breastfeeding?**

Finally women were asked where they received most of their support for their decisions to start and continue breastfeeding. There were a large number of responses that simply stated, “Friends and family,” but husbands and mothers were specifically named. Mothers were a role model. *“My mother breastfed me & all my siblings, along with most of my family chose to breastfeed their children also. So it was more common in my family to do so.”* One woman pointed out that for her breastfeeding was so common in her family that it, “wasn't really a decision that [she] had to make. [She] assumed that it was what [she'd] do, and that helped [her] confidence enormously in the early days.” Others described that breastfeeding was just the norm and the family and they were just following footsteps, *“My mom was my first example. I knew she had always breastfed her babies, and she gave me confidence that I could be successful.”* Women also mentioned aunts and sisters being supportive through breastfeeding obstacles as well as other mothers and friends.

Husbands were the most mentioned supporters in this group of women. The women were appreciative of husbands doing productive things while they were breastfeeding and even for helping them position the infant during feeding sessions. One woman described her husband’s support as priceless, *“I had a strong desire to breastfeed and [my husband] supported me every step of the way, and through unsupportive situations he's been invaluable.”* Another women explained that it was vital for husbands to be supportive, *“I think that [is] crucial. A husband HAS to be supportive because breastfeeding affects so much of his life: his relationship with the baby, sleep patterns, sex etc.”*

**Table 9-** Frequency: Where did you get the most support for your decision to start and continue breastfeeding?  
(n=55)

<b>Emerging Themes</b>	<b>Number of Times Mentioned</b>
Husband	21
Mother	13
Family	16
Friends	16

### **Discussion**

In the first analysis of this study explored, in a sample of successful breastfeeding women, some demographics and infant characteristics associated with terminating breastfeeding before the infants were 9 months of age. Secondly, a subset of these women reported on some of the reasons contributing to their stopping breastfeeding after they successfully breastfed for 3 months. Finally we asked for the women’s personal opinions on why other women stop breastfeeding before 3 months, what healthcare providers and communities can do to support breastfeeding until the infant is one year old, and where did they receive the most support for their decision to start and continue breastfeeding?

Of the 131 original study participants 73% were still breastfeeding when their infants were 9 months old. The sample of women was predominately white and well educated with

diverse, mostly higher level, incomes. Women that received state or government assistance for a shorter period of time (fewer years) and/or received unemployment stopped breastfeeding by 6 months. However there were few women in the study who recorded receiving unemployment or government/state assistance. Also, of women reporting incomes below \$60,000, 81% were still breastfeeding when their infants were 9 months of age, while only 52% of women reporting incomes over \$60,000 were continuing.

In the literature, demographics can play a role in identifying which women initiate breastfeeding and terminate early. These women are usually younger, less educated, and unmarried with lower incomes (Ahluwalia, 2005). African American women are also less likely to breastfeed while Hispanic women are more likely to breastfeed for a longer period of time (Li, 2005). This study's sample of women match the characteristics of women who breastfeed for longer durations. This difference in income and breastfeeding duration in this study was surprising. Less women breastfeeding at a higher income (over \$60,000) could possibly be attributed to women having to return to work. Since more women are working in these times, mostly due to new working norms and possibly due to recent economic decline, it is making it increasingly harder for women to stay at home and breastfeed their infants until one year of age. The difference in the breastfeeding percentages at a higher income could also be related to the education level of the sample. The majority of the women received a college education which could lead to higher job responsibilities and more pressure to return to work. Additionally, since the Family and Medical Leave Act only permits 3 months of paid maternity leave, these women might be forced to return to work to keep their family income consistent.

When a sub-set (n=121) of the previously mentioned women were surveyed, 55 responded. Of the 55, 6 women reported that they were still breastfeeding and 6 women didn't provide a response. For those women who reported stopping, the average age of the infant when breastfeeding stopped was 14.31 months. Most reasons given on the survey were marked as



contributing *not at all* to their reasons for stopping (**Table 4**), but *my infant's age* was the highest marked reason for contributing *a lot* to their decision to stop breastfeeding. The mean score for the self-weaning factor was also the highest average score indicating it contributed more than any other factors. In a Pearson Correlation analysis, the age of the infant was positively correlated with the reason of *my significant other wanted me to stop*. The analysis also showed that the psychosocial and lifestyle factors recorded in the survey results were significantly correlated. There was a negative correlation between the nutritional factor and the age of the infant. There was no significant correlation between the lactational factor and the age of the infant.

*My infant's age*, which was included in the self-weaning factor, was expected to be the most common reason to contribute *a lot*, considering the average age of the infant's when breastfeeding stopped was 14.31 months. The infant's age is more than likely the same reason for the high mean score for the self-weaning factor. More than likely the act of self-weaning was initialized due to the infant's age. Mothers also could have decided that their infant had reached the age where breastfeeding was no longer necessary and that was their main reason to start weaning the infant. *Breastfeeding was becoming too inconvenient* (psychosocial factor) and *I wanted my body back to myself* (lifestyle factor) were the next highest percentage scores in the survey responses. This suggests that, after the infant's age was accounted for, lifestyle and psychosocial factors were contributing to their decisions to stop. Although *my infant's age* was the highest contributor in the *a lot* column at 30.4% this is not considered the majority. The results of this survey indicate that there isn't a dominant reason why women stop after they've successfully breastfed for 3 months. It seems to be a complicated decision with much more than just one contributing factor.

The positive correlation between the age of the infant and, *my significant other wanted me to stop* suggests, in this survey, that significant others have an influence on breastfeeding termination in addition to the decision to start breastfeeding. It seems that when the infant

reaches a certain age the significant other was more inclined to stop supporting breastfeeding and encourage termination. The negative correlation with the age of the infant and the nutritional factor suggests that once the infant showed a nutritional problem breastfeeding stopped. This could possibly be because nutritional problems are more likely to occur at a younger age and when it's exposed mothers were more likely switch to formula. The switch could also be enabled by the physician who might suggest switching to formula to increase weight gain or due to a supposed allergy requiring a special formula. The absence of a relationship between the infant's age and the lactational factor supports the hypothesis that lactational factors are less of an influence on termination after breastfeeding has been established for 3 months. This was also true in the results of a similar study that evaluated the top reasons why women stopped over the first year of breastfeeding (Li, 2008). The results were similar in that one of the top three reasons why women stopped breastfeeding within the first two months was, *baby had trouble sucking and latching on*, but in all the subsequent months lactational factors were not significantly involved in breastfeeding termination.

The positive correlation between the psychosocial and lifestyle factors is intriguing, particularly given the low mean scores on the survey. The reasons for termination in the psychosocial and lifestyle factors are closely related in women who have breastfed for longer than 3 months. The combination of these results leads to a hypothesis that breastfeeding duration is more dependent on how the mother feels about how the psychosocial and lifestyle factors in her everyday life are affecting her breastfeeding. This could be key to breastfeeding education in order to increase duration rates and should be studied more.

The open ended questions found that the main reasons these surveyed women think other women stop breastfeeding before 3 months is due to inconvenience, return to work, pumping, and lack of support. The surveyed women thought that physicians needed to provide more education, encouragement/empowerment, and resources including lactation consultants these surveyed

women needed more support/acceptance of public breastfeeding and more private spaces to breastfeed. Also, husbands and mothers were the most common and important source of support.

When the women in the survey were asked for their opinion on why women stop breastfeeding before 3 months, the most common answer was because the women had to return to work. The women also appeared to dislike pumping breast milk and discussed the difficulties of pumping breast milk at home and at work, although when asked specifically in the survey how much this contributed to their decision to stop nursing 73% said not at all. Under the Family and Medical Leave Act of 1993, after an employee has been employed for one year they are entitled to 12 weeks of unpaid leave during a 12 month period (National Conference of State Legislatures (NCSL), 2012). Surgeon General Benjamin pointed out in her Breastfeeding Call to Action that the U.S. is one of only four countries that do not have a paid maternity leave policy (USDH, 2011). Eighteen weeks of paid maternity leave is recommended by the International Labor Organization. When mothers do return to work the Patient Protection and Affordable Care Act, H. R. 3590 signed by President Obama in 2010 requires all employers to provide a reasonable break time and private space, other than a bathroom, as frequently as needed for a woman to express milk for 12 months after the birth of her baby. The employer does not have to compensate the mother for the breaks taken (NCSL, 2011). Without a policy for paid maternity leave, mothers must return to work to support their family. In addition to having to return to work the mother is now forced to start pumping. This can become an issue, even if the mother's employer is providing break time and a private space, if the mother is having difficulty getting the pump to work accurately or if she simply cannot afford a pump that works efficiently enough for her employment situation. Therefore, education on pumping and access to higher grade breast pumps may be essential to increasing breastfeeding duration in working mothers.

When asked what health care providers can do to help increase breastfeeding duration, the women discussed more education on breastfeeding benefits, mechanics, and expectations.

However, a lot of women simply wanted to have more conversations with their health care providers about their breastfeeding experience and encouragement to continue. From these responses it seems that health care providers could help women by not just providing more information, but by being an advocate and providing more encouragement to the breastfeeding mom. This could follow a popularly behavior change model used to initiate and maintain a behavior change in an individual; the Transtheoretical Model (TTM). The TTM, “proposes that self-change in behavior is a process that occurs through five stages [pre-contemplation, contemplation, preparation, action, and maintenance] and that individuals use a variety of psychological and behavioral processes in making changes”(Contento, 2011 p. 108). In the terms of this theory, breastfeeding is very much a behavior change and not a single action. It takes time for a new mother to decide to breastfeed and then the *action* stage comes 9 months later after the birth of the baby. Specifically, in the *action* stage of the theory, intervention strategies for the healthcare provider include providing encouragement and support (Contento, 2011 p. 116). Self-efficacy also plays an important role in the TTM and action and maintenance is difficult without building on self efficacy through outside support and encouragement. These women are making a personal sacrifice for their infants’ and health care providers can help breastfeeding rates by applauding, supporting, and encouraging this decision.

There was an overwhelming response for the community to provide more private spaces to breastfeed by the women in the survey. Many women discussed having to breastfeed in a bathroom stall in public places because there was no designated area for them to breastfeed. There was discussion of public breastfeeding acceptance, but most of the women were concerned about having some privacy in a public area. This study was conducted in Oklahoma and Oklahoma is historically known to have more conservative ideals and values compared to other parts of the U.S. In a study using the 2002 Immunization Survey, geographic location was a significant factor in breastfeeding rates (Li, 2005). Mothers living in the Pacific, Mountain, and

New England regions had higher rates of initiation, duration, and exclusivity compared to mothers living in other regions in the U.S.. Because these regions also differ culturally, specifically to do with modesty or privacy, this evidence suggests that geographic region could have an influence on community support issues as well.

A large majority of the women surveyed in this study are married, which is historically associated with higher rates of breastfeeding (Li, 2008). When the women were asked where they received the majority of their support, “my husband,” was the most common answer. Some studies express that the breastfeeding mother and father create the, “breastfeeding team,” (Sharma, 1997; Rempel, 2010; Arora, 2000). Combined with the positive correlation results between *my significant other wanted me to stop* and the infant’s age suggests that significant others influence breastfeeding termination. This suggests that breastfeeding education should target significant others involved in the mother’s breastfeeding experience to make them aware of their importance as a breastfeeding supporter.

### **Limitations**

This on-line survey sample was fairly small with only 55 responses and not very diverse. However, it is a good representation of those who do breastfeed (white and well-educated) and was appropriate for the purpose of this study. The survey was sent to these mothers when their infant, who was involved in our previous study, was 2-4 years old. At that time some of these women had other children. There may have been some confusion, especially in the age of the infant when breastfeeding stopped, on which child the survey responses were answered for. The term “healthcare providers” is very broad. It was not clear which group of providers women wanted to be more encouraging. For educational purposes, a specific health care provider would have to be identified. There were more infant girls than there were boys; and the reason for the incongruity was not investigated. It could be because of chance or it could possibly be

explained by a problem with initiating breastfeeding with boys. The survey responses may have been confusing – with the participants perceiving little difference particularly the middle responses. In the analysis these responses were treated as a continuous variable so distinction may have been lost. All women were encouraged to respond truthfully, but there may have been some bias due to the fact that these women might have considered themselves advocates.

### **Conclusion**

Our results are consistent with previous research in terms of most demographics. The only statistically significant demographic that showed an association with breastfeeding termination was income level or state/government aid. There is no one prevailing reason why women stop breastfeeding after 3 months. From the results of the survey it seems that there are many factors that contribute to each individual's woman's decision to stop breastfeeding. However, women who have successfully breastfed for 3 months are less concerned with lactational factors and more pressured by psychosocial and lifestyle factors to terminate breastfeeding. Significant others are also shown to play an important role in breastfeeding decisions. Communities need more private spaces in public areas for women to breastfeed and health care providers need to increase education and encouragement in order to help breastfeeding continue for the infant's first year of life. Husbands, or significant others, are important to the breastfeeding process by providing support and have also shown to influence the timing of breastfeeding cessation. Given these results education should be targeted to potential breastfeeding women, community policy makers, health care providers, and significant others. Further research into which psychosocial and lifestyle factor reasons are contributing the most to these women's decision to stop breastfeeding will be helpful to better understand why women stop breastfeeding before their child is a year old after they've successfully breastfed for 3 months.

## CHAPTER IV

### CONCLUSION

The duration rates should be considered more critically than initiation rates because infants need to be breastfed for an extended period of time to receive the full benefits breastfeeding provides (Ip *et al*, 2007). Breastfeeding is beneficial to both infant and mother's health and can be beneficial to the U.S. economy if more mothers were to breastfeed longer (Ip *et al*, 2007; Bartick and Reinhold, 2010). Most breastfeeding research studies examine the problems and obstacles of the first few weeks of breastfeeding and data shows that ever breastfeeding can give an infant a health advantage over an infant that was never breastfed. However, the majority of these benefits are acquired after at least 3 months of breastfeeding and the risk of developing these diseases is inversely related to breastfeeding duration (Ip *et al*, 2007).

#### **Research Questions**

The results of this study contribute to the small number of studies that are done on women who have successfully breastfed for more than 3 months and will contribute information that will aid in creating interventions to overcome identified obstacles. The questions the research answered are:

- 1.) In a sample of successful breastfeeding women, which women, based on demographics, are more susceptible to terminating breastfeeding before 9 months? Some factors

examined will be ethnicity, socioeconomic status, and W.I.C. participation. Are there infant characteristics that contribute to this termination? For example, are women with male infants more likely to quit early?

In this study, women who received unemployment stopped before 6 months ( $p=0.003$ ). Women who received state or government assistance for the fewest years also stopped before 6 months ( $p=0.043$ ). These were the only demographic factors that showed significance. Of women reporting incomes below \$60,000, 81% were still breastfeeding when their infants were 9 months of age, while only 52% of women reporting incomes over \$60,000 were continuing.

- 2.) Are there infant characteristics that contribute to this termination? For example, are women with male infants more likely to quit early?

There were no infant characteristics that were significantly related to breastfeeding duration. However, there was a disproportion between infant genders (more girls than boys). There is evidence that female infants are more associated with longer BF duration times, but that was not investigated in this study (Hendricks et al. 2006; Scott, 1999)

- 3.) What are some of the reasons why women who successfully breastfed for 3 months stopped? Also, what are their opinions on why other women quit before 3 months, what physicians and communities can do to help support breastfeeding, and where did they receive most support for their breastfeeding decisions?

In this study when the women were asked to identify which of the given reasons contributed *not at all, a little, somewhat, or a lot*; *my infant's age* was the most frequently chosen response to contributing *a lot* to their decision to stop breastfeeding (30.4%). The variance in the responses suggests that there is no one overarching reason why women



who successfully breastfeed for 3 months stop. Lactational factors did not contribute at all to the decision to stop. Both questions included in the lactational factor had mean scores less than 1.2. When the breastfeeding factors were compared to the infant's age when breastfeeding stopped there was a positive correlation, which approached significance, to *my significant other wanted me to stop*. There was also a negative correlation between infant's age and nutritional factor ( $p = -0.403$ ). When the factors were compared to each other there was a significant correlation between psychosocial factor and lifestyle factor ( $r = 0.514$ ,  $p = 0.000$ ). There was no significant correlation between self-weaning factor and the infant's age. There was also no significant correlation between the infant's age and the lactational factor.

Of the 4 open-ended questions included in the survey, responses varied but certain themes emerged when each response was put into a category. This sample of women thought that other women stopped breastfeeding before 3 months because of inconvenience, return to work, pumping issues, and lack of support. They thought healthcare providers could increase breastfeeding duration by education, encouragement, and increasing resources available including lactation consultants. Acceptance and more private spaces to breastfeeding in public were needed from the community for breastfeeding support. Finally, husbands were the primary source of support for these breastfeeding mothers followed by mothers and then family and friends.

## **Implications**

The demographic analysis of this study found that income level and government assistance are significant demographic factors in duration rates. Women who received the least assistance and who made over \$60,000 stopped breastfeeding before 9 months. In the analysis of the survey, *returning to work/school* contributed *somewhat* or *a lot* to 21.4% of the women

surveyed. In the open ended questions *return to work* was the most common theme that emerged when women were asked why they thought other women failed to breastfeed for 3 months. Since more women are working in these times, mostly due to new working norms and possibly due to recent economic decline, it is making it increasingly harder for women to stay at home and breastfeeding their infant's until one year of age. Consequently if women have to return to work and still want to continue to breastfeed their infant the only option is to pump breast milk at work. Employers are required to have a private room and ample break time for a mother to breastfeed according to the Patient Protection and Affordable Care Act, H. R. 3590. This law needs to be seen that it is enforced as well as accepted. Some of the surveyed women said they felt as if their bosses and other employees resented them for getting time to breastfeed instead of having to work. Teaching the proper ways to use different types of breast pumps is also going to be invaluable to working mothers. Being able to use your specific breast pump effectively and efficiently will increase the breast milk pumped while decreasing the time away from work. Because of these factors, awareness and education must be focused on employers and breast pumping.

Community officials and healthcare providers must also be included in breastfeeding education; not on the benefits of breastfeeding, but on how their actions can impact the breastfeeding rates in their areas. In Oklahoma, women desperately want more private spaces in public areas where they can take their infant to breastfeed. As of now there are no regulations on public places, such as restaurants or retail shops, to have private areas for breastfeeding. If this was changed by Oklahoma legislatures then breastfeeding duration rates may possibly increase. However, because of the differences of opinions on health and social acceptance the results of this study regarding community support is not applicable to every state. In order for each state or community to increase breastfeeding duration, they must first discover what it is that breastfeeding mothers need from their community to enable them to continue breastfeeding more

easily. In addition to community awareness and involvement, health care providers within the community should also be aware of the community information and their impact on breastfeeding. From the results of this research, many women need their healthcare providers to be advocates and encouragers for breastfeeding. It seems as if the education of the benefits of breastfeeding are possibly more important to initiation rates, but encouragement and support to continue breastfeeding is more important to duration rates. The responses of the open ended questions brought attention to the fact that pregnancy, birth, and infant health are practiced by different physicians. One group of health care providers would have to be identified for breastfeeding education to ensure the most effectiveness.

Because literature supports that fathers play an important role in breastfeeding (Sharma, 1997; Rempel, 2010; Arora, 2000) and that unmarried women are less likely to breastfeed (Li, 2005), education must also be directed at the significant others involved in the pregnancy/breastfeeding experience. The majority of the women surveyed said that their husband was where they received the most support for their breastfeeding decisions. The analysis of the breastfeeding factors also showed that the infant's age correlated to the reason *my significant other wanted me to stop*, indicating that significant others have an influence on the time of breastfeeding cessation. Significant others should be involved in all breastfeeding education and must be aware of their importance in the entire breastfeeding experience. It would also be very helpful to educate significant others on the benefits of breastfeeding along with different strategies to help their breastfeeding partner. Most importantly significant others need to know that they are indeed involved in breastfeeding success even if it doesn't involve them directly feeding the baby.

## **Future Research**

The breastfeeding factors in this study (lactational, psychosocial, nutritional, lifestyle, medical, pumping, and self weaning) are fairly new in the study of why women stop breastfeeding. The reasons have been around for some time, but actually grouping them into factors provides an interesting, broader way of looking at why women stop breastfeeding. In this study the psychosocial and lifestyle factors significantly correlated to each other. The items included in the two factors give some of the specific reasons why women who have breastfed for 3 months stop, but the relationship between the two factors is unclear. Studying more reasons that could be included in the psychosocial or lifestyle factors and their relationship to each other could be beneficial in breastfeeding duration research.

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## APPENDICES

### Oklahoma State University Institutional Review Board

Date: Friday, September 21, 2012  
IRB Application No HE1263  
Proposal Title: Why do women stop breastfeeding after successfully breastfeeding for 3 months?

Reviewed and Processed as: Exempt

Status Recommended by Reviewer(s): Approved Protocol Expires: 9/20/2013

Principal Investigator(s):

Haley Schwager	Tay Seacord Kennedy
3307 S. Bahama Dr.	301 HES
Sand Springs, OK 74063	Stillwater, OK 74078

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The IRB application referenced above has been approved. It is the judgment of the reviewers that the rights and welfare of individuals who may be asked to participate in this study will be respected, and that the research will be conducted in a manner consistent with the IRB requirements as outlined in section 45 CFR 46.

The final versions of any printed recruitment, consent and assent documents bearing the IRB approval stamp are attached to this letter. These are the versions that must be used during the study.

As Principal Investigator, it is your responsibility to do the following:

1. Conduct this study exactly as it has been approved. Any modifications to the research protocol must be submitted with the appropriate signatures for IRB approval. Protocol modifications requiring approval may include changes to the title, PI, advisor, funding status or sponsor, subject population composition or size, recruitment, inclusion/exclusion criteria, research site, research procedures and consent/assent process or forms.
2. Submit a request for continuation if the study extends beyond the approval period of one calendar year. This continuation must receive IRB review and approval before the research can continue.
3. Report any adverse events to the IRB Chair promptly. Adverse events are those which are unanticipated and impact the subjects during the course of this research; and
4. Notify the IRB office in writing when your research project is complete.

Please note that approved protocols are subject to monitoring by the IRB and that the IRB office has the authority to inspect research records associated with this protocol at any time. If you have questions about the IRB procedures or need any assistance from the Board, please contact Beth McTernan in 219 Cordell North (phone: 405-744-5700, beth.mcternan@okstate.edu).

Sincerely,



Shelia Kennison, Chair  
Institutional Review Board

## Breastfeeding Survey

How old was your infant when you **totally** stopped breastfeeding? \_\_\_\_\_ Months  
 Haven't Stopped

The following are a list of some contributing factors to why women decide to stop breastfeeding. Please check: not at all, a little, somewhat, or a lot in comparison to how these reasons contributed to **your** decision to stop breastfeeding. If you are still currently breastfeeding, please indicate what you think will most likely influence your decision to stop.

	Contributed			Contributed
	Not at all	A little	Somewhat	A lot
My breasts became too large and engorged.				
My breasts started leaking too much.				
Breastfeeding was becoming too inconvenient.				
I wanted to have someone else be able to feed my baby.				
Breastfeeding in public was becoming uncomfortable.				
I started having trouble with my let down.				
My baby was gaining too much weight.				
My baby wasn't gaining enough weight.				
I wasn't making enough milk for my baby's needs.				
I had to return to work/school.				
I wanted to start a weight loss diet.				
I wanted to start drinking alcohol again without having to worry.				
I wanted my body back to myself.				
My baby became sick and needed outside attention.				
I became sick and started taking medication.				
I became pregnant again.				
I didn't want to pump at work.				
Pumping was taking too much time and effort.				
My baby started biting after he/she got teeth.				
My baby lost interest in breastfeeding.				
My infant's age.				
My significant other wanted me to stop.				

Any other important reason that contributed/you think will contribute to your stopping:

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There are high rates of women that start breastfeeding, but the majority of those women stop before their infant is 3 months old.

What are two main reasons **you** think this happens?

Supporting breastfeeding to 12 months is a current public health goal.

What do you think **health care providers** can do to support breastfeeding until the infant is at least one year old?

What do you think **society or the community** could do to support continued breastfeeding?

Where did you get the most support for your decision to start and continue breastfeeding?

# VITA

Haley Schwager

Candidate for the Degree of

Master of Science/Arts

Thesis: WHY DO WOMEN STOP AFTER SUCCESSFULLY BREASTFEEDING FOR 3 MONTHS?

Major Field: Nutritional Sciences

Biographical:

Education:

Completed the requirements for the Bachelor of Science in Nutritional Sciences at Oklahoma State University, Stillwater, Oklahoma in May, 2011.

Experience:

Dietetic Intern, Oklahoma State University, August 2011 to present

Graduate/Undergraduate Research Assistant, Nutrition and Development Project:  
Better Outcomes for Oklahoma Babies, Oklahoma State University, Stillwater, Oklahoma, April 2009 to present

Diet Clerk, Stillwater Medical Center, Stillwater, Oklahoma, April 2009 to present.

Publications:

Experimental Biology, April 2010, Poster Presentation, *Early Termination of Breastfeeding.*

Professional Memberships:

Oklahoma Academy of Nutrition and Dietetics (OKAND) Spring Convention  
Committee

Graduate Students in Nutritional Sciences  
Oklahoma Academy of Nutrition and Dietetics  
American Academy of Nutrition and Dietetics