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Community Breastfeeding Attitudes and Beliefs

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COMMUNITY BREASTFEEDING ATTITUDES AND BELIEFS

By

Patty Ryan Maloney Vari

Bachelor's of Science in Nursing, University of Kentucky, 1976

Master of Science, University of North Dakota, 1996

A Dissertation

Submitted to the Graduate Faculty

of the

University of North Dakota

in partial fulfillment of the requirements

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2007

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This dissertation, submitted by Patty M. Vari in partial fulfillment of the requirements for the Degree of Doctor of Philosophy from the University of North Dakota, has been read by the Faculty Advisory Committee under whom the work has been done and is hereby approved.

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This dissertation meets the standards for appearance, conforms to the style and format requirements of the Graduate School of the University of North Dakota, and is hereby approved.

Dean of the Graduate School

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Department: Teaching and Learning
Degree: Doctor of Philosophy

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Date November 15, 2007

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ABSTRACT

Breastmilk is designed by nature to meet the specific needs of the human species and provides all that is necessary for normal infant growth, development, and health for the first six months of life. Efforts to extend that message publicly have resulted in an increase of breastfeeding rates, yet still have not reached the goals of Healthy People 2010. This paper adds to the body of breastfeeding literature to understand why some women breastfeed and others do not by exploring some of the individual characteristics of a Midwestern university community, including their breastfeeding and bottle feeding (formula) beliefs, attitudes, and breastfeeding exposure, and then comparing that to their breastfeeding behaviors. Findings from this study will provide information to policy makers and clinicians for developing educational programs and crafting strategies to improve breastfeeding rates.

The convenience sample of 776 respondents from a Midwestern university community completed an online survey. This retrospective study determined demographic and experiential correlates of positive breastfeeding beliefs and attitudes, breastfeeding appropriateness in various settings, and respondents with children, having breastfed or not. The predictor of whether a Faculty, Staff, or Administrator (FSA) respondent breastfed at least one child was positive breastfeeding beliefs. Predictors for either the FSA or Student groups on breastfeeding attitudes were age and breastfeeding beliefs for the FSA group; age, gender, childhood breastfeeding observations, and breastfeeding beliefs for the

Student group. Predictors for either the FSA or Student groups on breastfeeding beliefs were gender and breastfeeding attitude for the FSA group; education, income, and breastfeeding attitudes for the Student group. Predictors for either the FSA or Student groups on breastfeeding appropriateness in various settings were breastfeeding attitude for the FSA group; age, education, childhood breastfeeding observations, breastfeeding attitudes, and breastfeeding beliefs for the Student group.

Of the respondents who had children, 85% had breastfed, indicating a higher rate of breastfeeding than the general population. Even this breastfeeding supportive group of participants felt that breastfeeding in public places was inappropriate. In the student group, one-third to one-half thought that church, school, and restaurant were inappropriate places for breastfeeding women.

CHAPTER I

INTRODUCTION

Breastfeeding has been life sustaining since the beginning of human existence. Breastmilk is designed by nature to meet the specific needs of the human species and provides all that is necessary for normal infant growth, development, and health for the first six months of life. Breastmilk continues to supply crucial immunological and nutritional value as long as the infant or child breastfeeds. Throughout history, there have been various alternative ways to feed infants, ranging from other mammal's milk to food pulp, but there is no question among the scientific community that human milk, because of its known and unknown components, reduces the risks of specified diseases and medical conditions from infancy through adulthood. Other important elements of breastfeeding include the emotional value of the bonding process that takes place between the mother-infant dyad and the reduction of health risks to the woman who breastfeeds (Lawrence & Lawrence, 1999).

Breastmilk's significance in health has been well documented in the research literature and efforts to extend that message publicly have resulted in an increase of breastfeeding rates from a low of 25% in 1971 to its current rate of 70.9% for infants breastfed on hospital discharge (Centers for Disease Control and Prevention [CDC], 2005a; Ryan, Pratt, et al., 1991). The number of breastfeeding infants leaving the hospital is approaching the 75% goal of Healthy People 2010 (Office of Disease Prevention and Health Promotion, 2000), but there is marked breastfeeding rate differences among

diverse categories of people. Just as important as the discrepancy in breastfeeding populations is the steep breastfeeding attrition rate, with only 39.1% still receiving any amount of breastmilk at six months (CDC, 2005). The Healthy People 2010 goal is for 50% of infants to be breastfeeding at six months. The goals of Healthy People 2010 and the recommendations from the World Health Organization (WHO) (2003), American Academy of Pediatrics (AAP) (2005), and other health profession organizations are to increase breastfeeding rates to improve the health of the population (American Academy of Family Physicians, 2000; Office of Disease Prevention and Health Promotion, 2000). The AAP has set what is considered to be the standard recommendation for breastfeeding: exclusive breastfeeding for six months, followed by introduction of foods, with continuation of breastfeeding at least until 12 months and as long as mutually desired by the breastfeeding dyad (2005). The WHO (2003) differs in recommending that breastfeeding should continue for at least two years.

There have been many studies related to the topic of human milk feeding to try and understand why some women breastfeed and others do not. Reasons for choosing and maintaining breastfeeding as the infant feeding method, barriers that interfere with the behavior, variables associated with either breastfeeding or not, and the measurement of breastfeeding outcomes related to different interventions make up a good deal of the writings linked to the topic of mother's milk. This paper will add to the body of breastfeeding literature by exploring some of the individual characteristics of a Midwestern university community, including their breastfeeding and bottle feeding (formula) beliefs, attitudes, and breastfeeding exposure, and then comparing that to their breastfeeding behaviors. Findings from this study, which will highlight the links between

breastfeeding perceptions of a community population and their breastfeeding behaviors, will provide information to policy makers and clinicians for developing educational programs and crafting strategies to improve breastfeeding rates.

Theoretical Framework

The current trend in the breastfeeding literature is to recognize that an ecological view of explaining breastfeeding behavior is an appropriate way to account for all the variables that shape the decisions that families make when it comes to feeding their babies. In a recent CDC “Babies were Born to be Breastfed” advertising campaign, an ecological approach that emphasizes settings of home, health care, community and workplace is used (2005). Families make infant feeding decisions not in isolation but in the context of their surroundings and all that entails. Bronfenbrenner (1979) best illustrates this environment with the ecological model that describes the micro, exo, meso, and macrosystems. The microsystem is made of the home, healthcare, and social settings while the exosystem is the indirect influence from related settings, such as the work setting. The mesosystem is the link between these settings and the macrosystem forms the outer circle made up of beliefs, values, attitudes, and normative behavior. While Bronfenbrenner’s model provides a broad ecological overview, other behavioral theories, such as the Social Cognitive Theory and the Theory of Planned Behavior outline more detail of the many facets involved in the behavior of breastfeeding.

According to the theory of planned behavior, behavior can be predicted by a person’s intent to perform the behavior. The *intention* to perform a behavior (breastfeed) is affected by the *attitude* toward the behavior. If a mother has the attitude that breastfeeding will lead to better health for mother and baby, then she may intend to

breastfeed. Intention is also affected by the *subjective norm*, which are the beliefs of the important persons to the mother. If the important people to the mother believe that babies should be breastfed, then the mother may intend to breastfeed. The *perceived behavioral control* beliefs are when a mother believes she will be able to exercise some control over the behavior. For an example, if a mother believes she can breastfeed and care for a 2-year-old, then she may intend to breastfeed (Ajzen & Fishbein, 1980).

Behavioral beliefs such as beliefs about the outcome if the behavior is performed can predict the *attitude* toward that behavior. *Normative beliefs* such as the value that is placed by one's culture on a particular behavior can help to predict *subjective norm*. *Control beliefs* predict *perceived behavioral control*. *Behavioral, normative, and control beliefs* can all be influenced by individual differences and by interventions (Ajzen & Fishbein, 1980). The Theory of Planned Behavior has been tested by some researchers conducting breastfeeding studies (Duckett et al., 1998; Giles et al., 2007; Wambach, 1997) and used by other researchers to help explain breastfeeding behavior (DiGirolamo, Thompson, Martorell, Fein, & Grummer-Strawn, 2005; Forster, McLachlan, & Lumley, 2006; Kessler, Gielen, Diener-West, & Paige, 1995). Henly, Duckett, Anderson, and Vari (2005) developed the Ecological Reformulation of the Theory of Planned Behavior for Breastfeeding to explain breastfeeding behavior using the Theory of Planned Behavior in the context of environmental settings, which has yet to be tested in a research study. Social cognitive theory offers a similar perspective on breastfeeding behavior.

A social cognitive (learning) theory of behavior was developed by Bandura (as cited in Kohler, Grimley, & Reynolds, 1999) which explains *behavior* in the context of the *environment* and *personal factors*. The Bandura social learning theory has been

linked to informal and incidental learning, which is an important topic of adult learning theory (as cited in Marsick & Watkins, 2001). Informal learning may take place unconsciously and may be taken for granted because informal learning occurs when simply talking to others and/or observing behaviors and outcomes of a behavior. The concept of informal learning is related to Bandura's theory in that learning takes place in everyday encounters while individuals interact with their environments. It is those personal and environmental factors that influence behavior. For this current proposal, the behavior under discussion is breastfeeding. A woman who lives in an environment where she observes other women breastfeeding and has done so since childhood has learned not only that breastfeeding is the normal way to feed a baby, but has also learned by observation how a baby is held for breastfeeding. As in the Theory of Planned Behavior, the influences of the *subjective norm* or important persons in the environment affect behavior because of the informal learning that takes place.

The breastfeeding literature most often reflects the author's attempt to appreciate a small part of the ecological model in hopes that the consideration of many parts will eventually provide understanding of the whole picture. In that respect many surveys have been collected, many interventions have been measured, and much has been written about the variables associated with breastfeeding. These writings provide important information for health care professionals as they work to improve the health of infants and women through breastfeeding. Foundational breastfeeding knowledge will provide the base for understanding what is currently known about breastfeeding.

Purpose

The purpose of this study is to describe and analyze the prevalence, patterns, and correlates among various breastfeeding attitudes and beliefs, bottle feeding attitudes and beliefs, experiences with breastfeeding, and feelings about viewing breastfeeding in various settings in both a student and adult (employee) community sample from a Midwestern university.

Research Questions

1. What are the prevalences of breastfeeding experiences, attitudes, and beliefs in the student and faculty/staff/administrators (FSA) community samples?
2. What are the demographic and experiential correlates of (a) positive breastfeeding attitudes and beliefs; and (b) for respondents with children, having breastfed?
3. Because the prevalence of perceptions about “breastfeeding inappropriateness” in public settings has been high in previous studies, what are the various demographic and experiential correlates of feelings about viewing breastfeeding in various settings for the two samples of respondents?

CHAPTER II

REVIEW OF LITERATURE

The history of infant feeding and current breastfeeding policies from professional organizations, as well as some epidemiological data will provide a base of breastfeeding knowledge to further explore factors that affect breastfeeding.

Historical Perspective

Breastfeeding was natural and instinctive behavior related to infant feeding because learning about it took place in subtle ways that were integrated into the culture and at early ages. It was the only way to feed. In the late 1800's and early 1900's the introduction of glass bottles and rubber nipples provided alternative methods for infant feeding. Water supplies became more sanitary, there was milk pasteurization, and the ice box was introduced. The beginning of a technologic and scientific age spawned the development of artificial baby milks that were commercially advertised to mothers and to health professionals. Physicians began to endorse these artificial milks and their use proliferated. Artificial milk became the new, more modern way to feed a baby. From the 1940s to 1970 there was a rapid decrease in breastfeeding rates. The lowest breastfeeding rate recorded in the US was in 1971 at 25%, which means that only 25% of the babies born were being breastfed when they left the hospital (Riordan & Auerbach, 1993). Ironically, at the same time artificial baby milk was introduced, studies performed on large populations showed that babies fed artificial milk were 3 to 5 times more likely to die than those babies that were breastfed (Huenekens, 1924). The proliferation of studies

in the last 20 years on breastfeeding issues has clearly demonstrated why *not breastfeeding* is a public health concern.

Importance of Breastmilk and Breastfeeding

Breastmilk is significant for reducing disease risks in infancy through adulthood. Its importance is undisputed among the scientific community. Compilations of the many research studies documenting the risks of not breastfeeding are represented by the AAP Policy Statement on Breastfeeding and the Use of Human Milk (2005); Association of Women's Health, Obstetric and Neonatal Nursing (AWHONN) Evidence-Based Clinical Practice Guideline (2007); International Lactation Consultant Association (ILCA) Position Paper on Infant Feeding (2000); Breastfeeding, Maternal & Infant Health Outcomes in Developed Countries (Agency for Healthcare Research and Quality [AHRQ], 2007), and the book, *Breastfeeding: A Guide for the Medical Profession* (Lawrence & Lawrence, 2005).

Research studies reviewed by the AAP (2005), AWHONN (2007), ILCA (2000), AHRQ (2007), and Lawrence and Lawrence (2005) specify that infants who are not breastfed are at greater risk for developing the following infections: diarrhea, respiratory tract infections, otitis media, rotavirus, enterobacteria, streptococcus pneumoniae, necrotizing enterocolitis, bacteremia, bacterial meningitis, and urinary tract diseases. Other infant health benefits may include the following: protective effect against sudden infant death syndrome, protection for infants genetically at risk for allergies, protection against obesity, enhanced cognitive development and educational achievement, reduction of neonatal pain, decreased incidence of reflux and aspiration, and better neonate oxygenation and temperature regulation (AWHONN, 2007). Of importance to note is that

infant mortality rates in the United States, for infants older than four weeks, are reduced by 21 % if they are breastfed (Chen & Rogan, 2004). There is some evidence that breastfeeding may also provide protection against a variety of childhood and adult-onset diseases such as insulin-dependent and non-insulin-dependent diabetes mellitus, asthma, lymphoma, leukemia, Hodgkin's disease, ulcerative colitis, Crohn's disease, celiac disease, hypertension, and elevated serum cholesterol levels. More protective effects are realized with longer duration and six month exclusivity of breastfeeding (AWHONN, 2007).

Breastfeeding also plays a role in maternal health. Research studies reviewed by the AAP (2005), AWHONN (2007), ILCA (2000), AHRQ (2007), and Lawrence and Lawrence (2005) identify the risks for mothers who do not breastfeed, which include higher rates of anemia, blood loss, infection, and closer child spacing. Other research studies reviewed by AWHONN (2007) specify women who have a considerable lifetime history of breastfeeding have lower rates of osteoporosis and rheumatoid arthritis, in addition to ovarian, endometrial, and breast cancer. The psychological benefits for the breastfeeding woman and her baby are enhanced maternal-infant attachment (Unvas-Moberg & Eriksson as cited in AWHONN, 2007), enhanced maternal role attainment (Lothian, 1995), and preliminary evidence suggesting improved maternal mood (Feldman & Eidelman, 2003). The economic benefits of breastfeeding are reflected in the health costs saved because of healthier babies and decreased workplace absenteeism, as well as direct cost savings from not having to purchase formula (AWHONN, 2007).

Breastfeeding Prevalence

How many babies are being breastfed and for how long? What is the national report card on breastfeeding nationally? Are there differences in rates by groups, and how does the United States rank among other countries? How do we know when breastfeeding rates are good enough? The Healthy People 2010 goals for breastfeeding were developed based on the present breastfeeding rates and what level was deemed necessary to make a difference in the health of the general population. The Healthy People 2010 goals related to breastfeeding are for 75% of babies leaving the hospital to be breastfeeding, for 50% to still be breastfeeding at six months, and for 25% to continue breastfeeding for 12 months (Office of Disease Prevention and Health Promotion, 2000).

Measurement of Breastfeeding Rates

Measurement of breastfeeding rates for the United States beginning in 2003 is routinely conducted by the United States government using the National Immunization Survey (NIS) (CDC, 2007). Prior to the collection of breastfeeding data from the NIS, the most utilized breastfeeding data base was from Ross Laboratories, which manufactures artificial baby milk (Ryan, Pratt, et al., 1991). The current breastfeeding rates as measured by the NIS for babies born in 2004 are 73.8% ever breastfed, 41.5% still breastfeeding at 6 months, and 20.9% continuing at 12 months. The largest gap in present rates compared to the Healthy People 2010 goals is at the six month mark. The goal at six months is a 50% breastfeeding rate which is 8.5 percentage points ahead of the current rate of only 41.5% receiving breastmilk at six months (CDC, 2007; Office of Disease Prevention and Health Promotion, 2000).

The three prime benchmark measurements are *ever breastfed*, *any breastfeeding at 6 months*, and *any breastfeeding at 12 months*, but there is also data related to the recommendation that exclusive breastfeeding occur for the first 6 months of life.

According to the latest NIS, the exclusive breastfeeding rate is 30.5% at three months and 11.3% at six months. This reflects a drop from the 2004 NIS rates which were 38.5% and 14.1% respectfully (CDC, 2007). Important to note is that the wording of the exclusive breastfeeding questions were changed between surveys.

The 2005 breastfeeding rates represent a response to heightened education about breastfeeding over the course of the last 35 years. The breastfeeding rate in 1972 was 22%. Relative to 1972, the 2005 breastfeeding rates have come a long way. There has been some measure of success at increasing the breastfeeding rates but the rise has been inconsistent. Breastfeeding rates reached a plateau in 1984 at 59.7 % and then declined in 1989 to 52.2% (Ryan, Rush, Krieger, & Lewandowski, 1991). Public health initiatives at the federal level, such as the Surgeon General's Workshop on Breastfeeding (U.S. Department of Health and Human Services [USDHHS], 1984), USDHHS Blueprint for Action on Breastfeeding (USDHHS, 2000), and the United States Breastfeeding Committee work titled, "Breastfeeding in the US: A National Agenda" (United States Breastfeeding Committee, 2001) represented some of the national attempts directed toward improving breastfeeding rates. The USDHHS Office of Women's Health and the Ad Council launching a National Breastfeeding Awareness Campaign encouraging mothers to exclusively breastfeed for the first 6 months was another federal breastfeeding initiative. The WHO also has had many breastfeeding initiatives (2003). The fact that breastfeeding rates increased when money and effort were put toward that endeavor

provide further impetus to pursue effective means of increasing breastfeeding rates to ensure that most babies receive the health benefits of breastfeeding. Understanding breastfeeding prevalence among groups exhibiting various social, economic, and cultural characteristics is key in identifying the most successful means of increasing breastfeeding rates.

Prevalence by Social, Economic, and Cultural Characteristics

The data from the National Immunization Survey (NIS) delineates breastfeeding rates according to states, sex of child, ethnicity, birth order, WIC (Women, Infant, and Children Food Program) or non-WIC participation, maternal age, maternal education, maternal marital status, whether residing in a metropolitan statistical area (MSA), and poverty income ratio. Categories reported include the following: ever breastfeeding; breastfeeding at 6 months; breastfeeding at 12 months; exclusive breastfeeding at 3 months; and exclusive breastfeeding at 6 months. According to the most recent NIS survey from 2005, the ethnic groups falling below the national average across all categories are American Indian or Alaska Native and Black. Other headings under the national averages in all categories are mothers receiving WIC, mothers younger than 29 years, mothers with high school or less education, those unmarried, those residing in a non-metropolitan statistical area, and those with a poverty income ratio of 185% or less (CDC, 2007).

Having less education, less income, and being younger are established predictors of those women who are less likely to breastfeed, as are the mentioned ethnic groups. What is interesting to note is that women living in a non-metropolitan statistical area fall beneath the national averages in all breastfeeding categories. A metropolitan statistical

area is an area of 50,000 or fewer people. States falling below the national averages in all breastfeeding categories tend to represent the southern and Midwestern states with Mississippi, Louisiana, and Kentucky having the lowest rates and the western states of Oregon, California, and Washington having the highest rates. Further information comparing breastfeeding rates among the developed countries of the world helps expand our understanding of breastfeeding on a global level.

Breastfeeding Rates by Developed Countries

Reviewing prevalence rates among other developed countries provides a comparison for how the United States ranks with peer nations. Among the developed countries including the United States, Canada, Australia, and Europe, researchers (Callen, Pinelli, Atkinson, & Saigal, 2004) summarized several studies and found that Europe (74-99.5%) and Australia (91-97%) had higher breastfeeding initiation rates than either Canada (69-83%) or the United States (27-69%). The highest rates were in the Scandinavian countries and the lowest in the United States. The demographic characteristics of more education, more income, being married, and being older in age for those women breastfeeding was consistent across nations. Additional characteristics included being more likely to have a preventative health orientation, being less likely to have suffered from depression, and having an infant of normal weight and gestational age. The later characteristics suggest “that breastfeeding initiation and duration are partly related to determinants of health, including the social, economic, and cultural environment” (Callen et al., 2004, p. 291). Reviewing maternal characteristics is also important to the understanding of factors that impact breastfeeding behaviors.

Breastfeeding and Maternal Characteristics

The well known correlates of women less likely to breastfeed or to breastfeed for shorter durations include those mothers with less education, less income, are younger than 20 years of age, and are from certain ethnic minorities. Another characteristic of women more likely to choose formula are those planning to return to work. The 2005 NIS provides information that adds to the profile of the woman less likely to breastfeed—that is, being a woman who is less than 30 years old and who lives in a non-metropolitan statistical area (CDC, 2005).

Even though the largest increase in breastfeeding initiation rates in recent years has been with women enrolled in the WIC programs, (from 56% in 1997 to 65.8% in 2005), these women generally have lower rates because they are typically younger, less educated, and have less income (AWHONN, 2007). Overall, the profile of women who do breastfeed has changed little since an AAP 1982 Policy Statement on the Promotion of Breast-Feeding. The policy statement identified the woman who was most likely to breastfeed and for a longer period of time as one who had the following characteristics:

was breastfed as an infant, has successfully breast-fed an infant before, has friends who breast-feed their infants, receives support from health care personnel, receives support from her husband, strongly believes breast-feeding is healthy, believes her infants enjoy breast-feeding more than bottle feeding, has an educational level beyond high school, does not work out of the home, lives in a cultural environment that is supportive of breast-feeding, is socioeconomically advantaged, and does not belong to a racial minority (p. 655).

Knowing the characteristics of women who do or do not breastfeed helps identify groups at risk, but in order to affect change, it is important to understand the underlying reasons that affect that choice. Certain characteristics of breastfeeding women cannot be changed such as age and income, but many factors will be amenable to change, such as women's beliefs about the outcomes of breastfeeding or formula feeding. For instance, how does a woman's attitude and belief about breastfeeding and formula feeding affect her choice of infant feeding? How does her exposure to breastfeeding among family and friends affect her choice of infant feeding? How do her feelings about breastfeeding in public places affect her choice of infant feeding?

Other Factors Affecting Breastfeeding

Barriers

Many barriers to breastfeeding have been identified by women who choose to give formula to their babies. One of the most prevalent barriers discussed in the literature is that women who plan to return to work find it difficult to continue breastfeeding. Explicit problems of continuing to breastfeed after returning to work include decreased milk supply, fatigue, lack of time, lack of a place to pump, and lack of support (Hills-Bonczyk, Avery, Savik, Potter, & Duckett, 1993). Other barriers identified from the Iowa Lactation Task Force (2001) include the following: lack of confidence in ability to breastfeed; concerns about pain; perception of inconvenience; lack of social support from significant other, friends, family and professionals; smoking, alcohol, and drug use; busy lifestyle; embarrassment; free formula from WIC; and diet and health restrictions. The lack of community social support as a barrier may be mirrored in societal breastfeeding attitudes in general.

Societal Attitudes

A recent publication by Li, Rock, and Grummer-Strawn (2007) compared general public attitudes about breastfeeding from 1999 to 2003. Important indicators of current society feelings toward breastfeeding were evident from the following statements that were rated from *strongly disagree* to *strongly agree* in the Healthstyles Survey (CDC, 2003): *feeding a baby formula instead of breastmilk increases the chances the baby will get sick; infant formula is as good as breastmilk; mothers who breastfeed should do so in private places only; I am comfortable when mothers breastfeed their babies near me in a public place such as a shopping center*. One finding from the study is that respondents have decreased their tolerance for public displays of breastfeeding from 1999 to 2003. There were significant increases in agreement with the “breastfeed in private places” statement among White respondents and those from low-income households. Significant decreases with the “I am comfortable when mothers breastfeed” statement were recorded with women respondents and low-income respondents. Other results demonstrate a significant increase in knowledge about “formula increasing the chances the baby will get sick” but with a small percentage point change (2.7 percentage points). The disconcerting finding was a significant increase of 11.4 percentage points with the statement that “infant formula is as good as breastmilk.” The seemingly conflicting statements that both show an increase may indicate that two messages are being heard. The message that ‘not breastfeeding’ puts the baby at health risks is one, but the equally salient message heard is from infant formula companies that advertise their product as being ‘like breastmilk’ (Li et al., 2007).

The issue of public breastfeeding and the fact that “embarrassment” is seen as a barrier to breastfeeding is reflected in the apparent need for states to pass laws that clarify that women have the right to breastfeed in public settings in which they rightfully may access. To date approximately 39 states have enacted laws that give women the right to breastfeed without harassment (La Leche League International, 2007). A federal law was passed in 1999 that gave women the right to breastfeed her child at any location in a federal building or on federal property, if the woman and her child are otherwise authorized to be present at the location. The Right to Breastfeed Act, H.R. 1848 (1999) was written by Representative Carolyn Maloney after a breastfeeding mother was harassed on federal property (Vance, 2005). When breastfeeding women have laws to protect their right to publicly breastfeed, it is a significant indicator that societal attitudes toward breastfeeding may be an important area that needs to be addressed. Areas where changes have taken place to support, promote, and protect breastfeeding are in the health care arena.

Health Care Policies

Health care practices and hospital routines affect breastfeeding. Evidence that certain practices, such as rooming-in and not giving out formula company gift bags, improve breastfeeding initiation, duration, and exclusivity has been demonstrated (Aliperti & MacAvoy, 1996). The 1992 plan by the World Health Organization and United Nations International Children’s Emergency Fund (UNICEF) for the Baby Friendly Hospital Initiative (BFHI) (United States Fund for UNICEF, 2006) had the purpose of ensuring the right health care environment that advocated breastfeeding as the norm, so that every mother and baby would have the opportunity of optimal health. The

ten steps of the Baby Friendly Hospital Initiative include, for example, that mothers and babies should remain together 24 hours a day, that newborns should be given no food or drink other than breastmilk unless medically indicated, and that all health care staff should be trained in the skills necessary to implement the hospital's breastfeeding policy. The BFHI has the potential to make a difference in breastfeeding initiation and duration rates, but there are only 58 hospitals certified as BFHI in the United States. Other avenues to improve breastfeeding rates have been identified.

Interventions that Work

There have been various interventions developed to increase breastfeeding initiation, duration, and exclusivity. Interventions include prenatal and/or postpartum counseling delivered in groups or with individuals by professionals or by trained peer counselors (Vari, Camburn, & Henly, 2000). Three comprehensive analyses of breastfeeding support intervention trials have been conducted and provide a valuable resource for clinicians and researchers in developing their own evidenced-based protocols.

In 2003 the U. S. Preventative Services Task Force did a comprehensive review of behavioral interventions to promote breastfeeding, which included initiation and duration outcomes. The studies under review by the task force included a variety of breastfeeding interventions provided by diverse health professionals and in assorted settings. Their findings found sufficient evidence that the following activities would increase the proportion of women extending their breastfeeding duration to six months: clinicians providing structured breastfeeding education and behavioral counseling to promote breastfeeding; and providing ongoing clinician support through in-person visits

or telephone calls. There was insufficient evidence to support brief education from counselors, peer counseling alone, and written materials used alone or in combination.

A Cochrane Review (Dyson, McCormick, & Renfrew, 2005) concluded that five randomized controlled trials evaluating breastfeeding education promoting the *initiation* of breastfeeding were effective. The types of education represented by the studies included breastfeeding education and support delivered by a lactation consultant throughout the prenatal and postpartum period, women's use of a self-help manual prior to delivery, a 40-minute lecture with accompanying pamphlet delivered by a health professional, use of the Best Start health educational program by a health professional with four prenatal visits, and a visit with the baby's pediatrician at 32 to 36 weeks for the purpose of breastfeeding promotion. Unfortunately, only two of the five studies reported the assessment of intermediate/process outcomes such as knowledge, attitudes, and social support. A Cochrane Review that has not yet been completed is titled, "Antenatal breastfeeding education for increasing breastfeeding duration" (Lumbiganon et al., 2007) and is being conducted to report on the impact of *prenatal* breastfeeding education on the *duration* of breastfeeding, rather than the *initiation* of breastfeeding, which was the focus of the previous Cochrane Review.

The third analysis is a Cochrane Review (Britton, McCormick, Renfrew, Wade, & King, 2007) "Support for Breastfeeding Mothers," and included 34 studies which had randomized or quasi-randomized controlled trials comparing extra support for breastfeeding mothers with usual maternity care. The extra support was any intervention offering appropriate breastfeeding guidance and encouragement that was supplemental to the usual standard care. The studies included interventions that were either postpartum or

postpartum and prenatal. The main outcome measure was the duration of breastfeeding at several points in time (4-6 weeks, two, three, four, six, nine and 12 months). Other outcomes evaluated were exclusive breastfeeding, infant morbidity, and maternal satisfaction with breastfeeding. The main results of the review indicated that all forms of extra support (lay, professional, and combined) increased the duration of *any breastfeeding* and the duration of exclusive breastfeeding. With exclusive breastfeeding, either lay support or the combination of lay and professional support were more effective than professional support alone. Interesting to note is that the greatest effect of breastfeeding support interventions occurred in those communities where the initiation rate was 60% to 80%, which is defined as intermediate initiation. Interventions are usually developed to make a difference in those areas that are amenable to change (intermediate/process outcomes) and which would affect the outcomes of initiation, duration, and exclusivity of breastfeeding.

Breastfeeding Factors Amenable to Education and Support Programs

When developing interventions to affect change, it is valuable to focus on those variables such as mother's breastfeeding intention, knowledge, attitudes, and beliefs, which may be modified and will affect the desired outcomes. Other variables that may be targeted are the perceived support from significant others and professionals, plus the mother's confidence in her ability to perform the breastfeeding behavior (AWHONN, 2007).

Intention

All of the variables described are components of the Theory of Planned Behavior (Ajzen & Fishbein, 1980) and the proposed Theory of Planned Behavior Based Model for

Breastfeeding (Ducket et al., 1998). Intention has been addressed in a variety of studies. As early as 1983 Manstead, Proffitt, and Smart used the Theory of Reasoned Action (precursor to Theory of Planned Behavior) to predict and understand how mothers intended to feed their babies and then how they actually fed them at six weeks. Their findings supported the theory that attitudes, subjective norms, and perceived behavioral control all affect intention to perform a behavior, with intention predicting behavior performance.

Since 1983 intention has been a frequently measured variable in breastfeeding studies. Baisch, Fox, and Goldberg (1989) determined that intention predicted feeding method. Wambach (1997) tested the Theory of Planned Behavior and reported only attitudes and perceived control predicted intention with intention weakly predicting breastfeeding duration up to six weeks. Studies that have found intention as a predictor of breastfeeding behavior are DiGirolamo et al. (2005), Forster et al. (2006), and Kessler et al. (2002). Ducket et al. (1998) proposed the Theory of Planned Behavior Based Model for Breastfeeding from her study which determined attitude toward breastfeeding and bottlefeeding, subjective norm, and perceived control contributed to intention to breastfeed, with duration and intention the most highly correlated of all the predictor variables. Subjective norm or the perceived support from significant others is another factor that is modifiable.

Perceived Support

The perceived support that breastfeeding women feel from their significant others has been identified in the literature as affecting intention to breastfeed and breastfeeding outcomes. In 1992 Matich and Sims found that mothers who breastfeed received more

emotional and tangible support from the babies' fathers than mothers that bottle feed. Kloeblen-Tarver, Thompson, and Miner (2002) found evidence that significant others are important in the infant feeding decision for first time mothers. Dennis (2002), Kong and Lee (2004), and Swanson and Power (2005) identified significant others' support influencing either initiation or continuance of breastfeeding. Kessler et al., (1995) recognized that a woman's intention to breastfeed is strongly affected by her significant other's preference for infant feeding. In the same study the pregnant woman's self efficacy affected her successful initiation of breastfeeding.

Self-efficacy

A woman's breastfeeding confidence has been shown to affect either initiation or continuation of breastfeeding. Kessler et al. (1995) identified that high self-efficacy was significant in successful breastfeeding initiation as measured at seven days. Ryser (2004) found that the experimental group receiving the Best Start Program had significantly higher breastfeeding control scores (measures how confident a mother feels about breastfeeding successfully) than the control group and also had higher intention to breastfeed and initiation rates. Qualitative studies by Hall and Hauck (2006) and Moore and Coty (2006) found evidence that a mother's confidence about breastfeeding is important in predicting positive breastfeeding experiences. Cleveland and McCrone (2005) tested the reliability of a *Breastfeeding Personal Efficacy Beliefs Inventory* (BPEBI) scale. Besides intent, support, and self-efficacy variables that are amenable to interventions, there is also the attitude and beliefs variable that is amenable to education and support programs.

Knowledge, attitudes and beliefs toward breastfeeding have been explored in the literature in a variety of ways with a variety of tools. It is well understood that knowledge affects attitudes and beliefs, with attitudes and beliefs affecting intention to breastfeed as well as the breastfeeding outcomes of initiation, duration, and exclusivity. This information will provide the basis of the current study. The purpose of this study will be to describe and analyze the prevalences, patterns, and correlates among various breastfeeding attitudes and beliefs, bottlefeeding attitudes and beliefs, experiences with breastfeeding, and feelings about viewing breastfeeding in various settings in both a student and adult (employee) community sample from a Midwest university.

Breastfeeding Attitudes and Beliefs

Attitudes and beliefs about breastfeeding have been explored in the literature in a variety of ways. There are some studies that differentiate among breastfeeding attitudes, breastfeeding beliefs, bottlefeeding attitudes and bottlefeeding beliefs (Duckett, et al, 1998). Manstead, Plevin, and Smart (1984) used a semantic differential scale with several adjective pairs (unpleasant-pleasant) to score breastfeeding and bottlefeeding attitudes. Other researchers have used that method as well (Duckett, et al., 1998; O'Keefe, Anderson, & Henly, 1998). Researchers have also measured beliefs about breastfeeding and bottlefeeding as separate from attitudes, where beliefs are defined as belief about the outcomes of the chosen feeding method rather than the feelings associated with a feeding method (Duckett, et al., 1998; O'Keefe et al., 1998). For the majority of studies, survey questions used to determine attitudes often have a variety of statements, either to agree or disagree with, that could be technically defined as attitude and belief questions about both breastfeeding and bottlefeeding. Knowledge questions also seem to crop up in attitude

measurement as well (e.g. from the *Iowa Infant Feeding Scale*, [Shaker, Scott, & Reid, 2004] 'Breast milk is lacking in iron').

Most attitudes and beliefs studies survey either prenatal or postpartum women. There are very few studies that ask partners, young adults who have not yet had children, or community members, breastfeeding attitude questions. As discussed previously, the ecological model of breastfeeding behavior posits that environmental influences from the community reflect the cultural norm of the society in which an individual resides. The cultural mores and norms of a community project a powerful influence over health behavior decisions such as choosing an infant feeding method (Mulford, 1995). If a woman perceives that breastfeeding is appreciated and accepted by her community, then she is more likely to choose and be successful at breastfeeding (Tarkka, Paunonen, & Laippala, 1999).

Expectant Couples

There are several studies that report the breastfeeding attitudes and beliefs of the pregnant woman. A recent study surveyed the partners as well. Shaker et al. (2004) used the *Iowa Infant Feeding Attitude Scale* to assess infant feeding attitudes of a convenience sample of 129 expectant couples in Scotland. Scotland had, at the time of this study, a breastfeeding rate of approximately 46% at seven days, compared to the U.S. rate of approximately 68% at seven days (CDC, 2007; National Breastfeeding Advisor for Scotland, 2006). The measurement tool consisted of 17 attitude questions using a 5-point Likert scale between strongly agree to strongly disagree. Higher attitude scores represented more positive breastfeeding attitudes. Not surprisingly, the results indicated that both mothers and fathers of breastfeeding babies had significantly higher attitude

scores than parents who chose formula. Results indicated that formula feeding parents had poorer knowledge of breastfeeding than the parents of breastfed infants. Fathers of both breastfeeding and formula feeding babies were significantly more likely than mothers to believe that women should not breastfeed in a public place. An additional published study utilizing the same data as Shaker et al. (2004) was able to determine that maternal, but not paternal, infant feeding attitude was a better predictor of feeding choice than the demographic variables of “social deprivation,” number of children, or whether the baby lived with her/his father.

Only two other publications were found that measured fathers’ as well as mothers’ infant feeding attitudes. Shepherd, Power, and Carter (2000) studied 489 delivered couples from Scotland, measuring their breastfeeding attitudes and their responses to narrative feeding scenarios. Results indicated fathers of breastfeeding infants were less aware of breastfeeding benefits and less supportive of breastfeeding than their partners. Fathers of bottle feeding infants had limited knowledge of breastfeeding benefits and were also more negative towards breastfeeding than their partners. Like the Shaker et al. (2004) study both fathers of breast and bottle feeding infants were more embarrassed than their partners about mothers breastfeeding outside the family boundaries. As demonstrated below, studies originating in the U. S. clearly show that breastfeeding embarrassment is a commonly reported theme that may be a significant barrier to increasing breastfeeding rates. The authors of the 2000 study by Shepherd et al. concluded that continued education of women who have not decided on breastfeeding and all expectant fathers is needed to allay misconceptions and address embarrassment issues. In the second of two studies measuring fathers’ attitudes, Freed, Fraley, and

Schanler (1993) determined that fathers actually had more favorable attitudes toward breastfeeding than their partners predicted, concluding that mothers are influenced by partners' attitudes toward breastfeeding but may not be accurate in their assumptions of the fathers' breastfeeding attitude.

Pollock, Bustamante-Forest, and Giarratano (2002) surveyed a sample of 100 men who had accompanied their partner to a prenatal visit on their breastfeeding knowledge and attitudes. The knowledge and attitude tool was newly developed by the authors and consisted of 32 items. Eighty-one percent of this convenience sample of men wanted their children to be breastfed, and men who were breastfed themselves were more likely to want their child breastfed. There were differences by race and occupation: African American men were less likely to prefer breastfeeding than all other men in the study and the "student" occupational category showed the lowest preference toward breastfeeding. African-American men also were most likely to say breastfeeding in public was embarrassing (41%). The total percentage that felt breastfeeding in public was embarrassing was 34% with no differences noted among levels of education. Among this group of interested and supportive partners, there was still evidence of unsupportive attitudes toward breastfeeding in public places. A qualitative study from Gill, Reifsnider, Mann, Villarreal, and Tinkle (2004) of low-income Mexican Americans indicated the following as major barriers to breastfeeding: lack of awareness of breastfeeding benefits; time, embarrassment, and pain related to breastfeeding; and lack of healthcare-provider support.

Three of the six studies cited related to couples' breastfeeding attitude were from Scotland with two of the six studies from low income ethnic populations (Hispanic and

African American). In these particular studies, the Scottish men appeared to be less supportive of breastfeeding than the low income men, but both groups identified similar barriers to breastfeeding, such as breastfeeding in public. The differences may be culturally related, but review of such studies also highlights similarities between cultural beliefs about breastfeeding. It is beneficial for health care providers to know the identified common barriers among groups, as education programs often address diverse groups of people.

Prenatal Women

Libbus (2000) used the *Breastfeeding Behavior Questionnaire (BBQ)* to measure breastfeeding attitudes in a sample of Hispanic women. Although almost all women reported their intention to breastfeed and had their partners' support, breastfeeding in public was still perceived to be embarrassing by many. Only 27% had reported seeing a woman breastfeed in public, which may be related to their feelings about public display of breastfeeding.

Wells, Thompson, and Kloeblen-Tarver (2002) measured intrinsic and extrinsic motivation to breastfeed and its relation to the level of intention to breastfeed. Intrinsic motivation was measured by survey questions related to concerns about health for the mother and the baby and desire for self-control. Extrinsic motivation was measured by questions related to immediate reinforcement and social influence. Level of intention to breastfeed was measured by assessing the participant's stage of breastfeeding intention, from "wanting to formula feed and not breastfeed" to "planning to breastfeed for at least six months" with five response categories from which to choose. The motivation instrument contains similar items to breastfeeding attitude tools and so was included in

this review of literature. There was a significant difference in the motivation score for those women intending to breastfeed compared to those that did not intend to breastfeed.

An additional study that sampled prenatal women examined the influence of breastfeeding attitudes, among other variables, on intention to breastfeed among low income women (Kloeblen-Tarver et al., 2002). Breastfeeding attitudes and social norms were measured using twenty statements with which participants either agreed or disagreed on a 5-point Likert scale and then also rated the strength of the importance of the item. Breastfeeding attitudes and social norms both predicted breastfeeding intention, with attitudes being the stronger predictor. If a woman had breastfed previously, attitudes and social norms were of less importance.

Postpartum Women

Arora, McJunkin, Wehrer, & Kuhn (2000) surveyed all mothers for one year from a community based hospital where the sample was 85.5% white and breastfeeding initiation rate was 44.3 %. Questions from the 28 item survey included agreement with statements that described factors contributing to either breastfeeding or bottle feeding. These statements were similar to questions asked to ascertain breastfeeding attitudes in other studies. Breastfeeding mothers identified the positive benefits of their infants' health, the naturalness of breastfeeding, and emotional bonding as primary reasons for their breastfeeding initiation. Bottle feeding mothers identified father's attitude, questionable milk quantity, and return to work as reasons for the infant feeding choice.

Guttman and Zimmerman (2000) used closed- and open-ended questions with low income mothers for the purpose of conceptually characterizing mothers' feelings regarding their infants' feeding choices. Women were surveyed on their breastfeeding

attitudes and beliefs. Both breastfeeding and bottle feeding groups tended to believe that breastfeeding offered greater health and psychological benefits than formula, but formula feeders attached less importance to those statements in matters of infant feeding choice. There were additional questions asked about reactions to breastfeeding in public. Twenty-one percent said they had never seen a woman breastfeed in public. The striking finding was that 50% of women that breastfed and 40% of women that bottle fed felt that others perceived public breastfeeding in a negative way. The mothers who formula fed but believed "breast was best" gave the following reasons for not choosing breastfeeding: work demands, life circumstances, nonsupport of significant others, and embarrassment. The authors concluded that some women breastfeed in spite of feeling society is unsupportive, while others choose not to breastfeed for possibly the same reason. The authors felt that low income mothers may have difficulties with breastfeeding because of the following social contradictions: Women are encouraged to breastfeed, but the behavior is not supported by employers of low income women, while women with higher income can afford breast pumps and may have a private office in which to pump; The media seldom depict women breastfeeding, yet the erotic breast is prominently displayed.

Rose, Warrington, Linder, and Williams (2004) studied an urban, economically disadvantaged, mostly African-American population to determine knowledge, attitudes, and beliefs about breastfeeding mothers and their social support network. Their convenience sample of 70 mothers out of 649 potential eligible mothers completed an 84 item survey instrument. Breastfeeding knowledge and attitudes were compared between mothers that breastfed and mothers that bottle fed. Significant differences were in the areas of convenience, breastfeeding being enjoyable, and pain with breastfeeding. The

partner and family members for the breastfeeding women were more knowledgeable about breastfeeding.

A 2005 study (Khoury, Moazzem, Jarjoura, Carothers, & Hilton) surveyed low income, postpartum women in Mississippi to determine the factors associated with breastfeeding initiation. Demographics factors as well as the Theory of Planned Behavior constructs of attitude, support, and perceived control were measured using a mail and phone survey. The response rate was 61% with a breastfeeding initiation rate of 38%. There were 10 questions related to attitudes, support, and perceived control. Ninety-two percent believed breastfeeding was healthier than formula, 78% believed breastfeeding can be enjoyable for the mother, while 16% felt breastfeeding had no health benefit for the mother, and almost a third believed that breastfeeding was embarrassing (28%). There were significant differences between those women who initiated breastfeeding and those who chose to formula feed in the category of embarrassment. Twelve percent of breastfeeding women versus 38% of formula feeding women believed that breastfeeding was embarrassing. A logistic regression analysis of infant feeding method indicated that women who believed breastfeeding was embarrassing were 35% less likely to initiate breastfeeding. Although women whose family encouraged formula were 50% less likely to breastfeed; if a doctor, nurse, or lactation specialist encouraged breastfeeding, a woman was 1 ½ to 2 ½ times more likely to breastfeed. The authors concluded that there is room for improving the health care system support for breastfeeding.

A 2003 study from Australia (Lin, Zhang, & Binns) reported that Chinese women living in Australia have a higher level of concern about breastfeeding in public than Anglo-Australian women. Over half of the Chinese mothers agreed that women should

not breastfeed in public. The authors suggested that embarrassment about breastfeeding may contribute to the early termination of breastfeeding in this reported population.

Embarrassment about public breastfeeding was also reported in a Hong Kong breastfeeding study (Kong & Lee, 2004). Two hundred and thirty first time mothers were asked a variety of survey questions related to their knowledge and attitudes about breastfeeding. Seventy-five per cent agreed that it is unacceptable to breastfeed in public, while 89 % agreed that breastfeeding is a natural human activity.

Breastfeeding knowledge and attitudes were also questioned in a survey conducted in five small villages in Jordan (Khassawneh, Khader, Amarin, & Alkafejei, 2006). Of the 344 women who participated in the survey the average score of 32/100 was given to the statement, "Community encourages breastfeeding over feeding infant formula", indicating disagreement with the item. The authors felt that embarrassment about public breastfeeding in Jordan was related to lack of environmental support.

One study surveying low income women (Meyerink & Marquis, 2002) to determine factors related to initiation and duration of breastfeeding had a random sample of 323 mothers, with 150 completing the survey information. Participants were from a county health clinic in a southern state. Data collected included socioeconomic and demographic characteristics, obstetric and breastfeeding history, and mother's exposure to the breastfeeding practices of others. The three variables that were significant in the logistic regression that predicted breastfeeding initiation were premature baby (decreased probability of breastfeeding), previous breastfed child, and mother having been breastfed. If a mother was breastfed herself, she was seven times more likely to initiate breastfeeding and ten times more likely if she had breastfed a previous child. A second

logistic regression was conducted to determine the factors associated with continued breastfeeding at 1 month. The number of close relatives who had breastfed affected the odds of breastfeeding at 1 month from two times more likely (one close relative breastfed) to 6 times more likely (3 close relatives). Duration of breastfeeding past one month was significantly associated with mother being breastfed and mother having previously breastfed a child as determined by a multiple linear regression. Demographic factors proved to be nonsignificant when added to previous exposure to breastfeeding in the regression model. The authors concluded that exposure to breastfeeding among role models either by close familial support or a community-based substitute may increase the breastfeeding initiation and duration rates among the study population.

Scott, Binns, Graham, and Oddy (2006) compared postpartum survey results from 1992 and 2002 to determine differences in factors that predict a woman's infant feeding choice. The surveys were done in an Australian public hospital where all eligible postpartum women were contacted to participate in the study, resulting in 68% participation rate. In both studies, using multivariate logistic regression analysis, the strongest independent predictor of breastfeeding at discharge was the perception of the father's attitude toward infant feeding. If mothers perceived that the father preferred breastfeeding, the baby was 10 times more likely to be breastfed at discharge from the hospital. Demographic characteristics were independent predictors in the 1992 study, where the initiation rate was 83.8 percent, but not in the 2002 study, where the initiation rate had increased to 93.8 percent. In the 2002 study the mothers were scored on the *Iowa Infant Feeding Attitude Scale* (IIFAS) which remained a significant predictor in the model as well. These authors concluded that as breastfeeding rates increase, other factors

such as parental infant feeding attitudes will be stronger predictors for choice of infant feeding method.

An earlier manuscript (Scott, Landers, Hughes, & Binns, 2001) combined the 1992 urban study described previously and a rural study to identify determinants of breastfeeding initiation and duration for Australian women regardless of location of residence. Using multivariate logistic regression, sociodemographic factors, biomedical factors, and the psychosocial factors of father and maternal grandmother preferring breastfeeding remained significantly associated with breastfeeding at discharge. The authors encouraged health providers to include fathers in breastfeeding discussions.

Two publications report findings from a single large randomly controlled intervention study conducted in Australia, where initiation rates were 82% in 2000 (Forster et al., 2004; Forster, McLachlan, & Lumley, 2006). Women, from a public hospital, choosing to be in the study, were randomly assigned to one of 3 groups; a practical aspects of breastfeeding intervention group, an exploration of family attitudes to breastfeeding intervention group, and a control group which received standard care. Demographic data and intention to breastfeed were asked prior to the intervention. Breastfeeding attitudes, social factors, hospital and obstetric factors, other potential influences, and outcomes were measured after birth and at 6 months postpartum. Breastfeeding attitudes were measured by asking questions about desire to breastfeed, confidence in breastfeeding ability, and partner and family's view of breastfeeding. Other survey questions pertained to being breastfed as an infant, rating of midwife's helpfulness, and relationship and anxiety problems. Results showed that there was no difference in breastfeeding initiation and duration at six months among the three groups.

The authors concluded that even among this group of relatively disadvantaged mothers, when breastfeeding initiation was high neither type of antenatal intervention had an effect on breastfeeding outcomes (Forster, et al., 2004). Of importance to note is that women in the control group receiving standard care, had access to lactation consultant support as necessary in the inpatient and outpatient setting, 24 hour telephone counseling, and a postnatal home visit by a midwife, all of which may have interfered with the ability to distinguish groups based on one additional prenatal support service.

The same study was used to report further analysis done to determine factors predicting women continuing to breastfeed at six months postpartum (Forster, McLachlan, & Lumley, 2006). All participants in the three arms of the study were included in the analysis. Twenty-five independent variables were part of the preliminary logistic regression model. Factors positively associated with breastfeeding at 6 months included strong desire to breastfeed, having been breastfed as a baby; being born in an Asian country; and older maternal age.

Studies of women in the postpartum period were from a variety of international regions. Australia, with a higher rate of breastfeeding than the United States, has identified possible predictors of breastfeeding when breastfeeding rates increase to a level above 80% (Forster et al., 2004; Forster et al., 2006). As the U. S. approaches such rates, Australia studies can be instructive to help recognize those areas that are amenable to change in high breastfeeding societies. Studies from Hong Kong (Kong & Lee, 2004) and Jordan (Khassawneh et al., 2006) again highlight the importance of community support for breastfeeding, which is found in U. S. studies, as well.

Longitudinal Studies of Women Before and After Delivery

Ryser (2004) conducted a Best Start breastfeeding educational intervention study for women intending to bottle feed or undecided about infant feeding. Pretest and posttest use of the *Breastfeeding Attrition Prediction Tool* resulted in the outcome measures of (a) positive attitudes toward breastfeeding; (b) negative attitudes toward breastfeeding; (c) social and professional support; and (d) breastfeeding control. Intention and initiation of breastfeeding were additional outcome measures. All outcome measures, except social and professional support, were significantly different from pretest to posttest for the intervention group. The intervention group was significantly improved compared to the control group. The author concluded that an educational program which addresses attitudes and beliefs is necessary in order to change behavior.

Moore and Coty (2006) carried out a qualitative study using focus groups to explore how prenatal attitudes, beliefs, and perceptions changed as a result of the postpartum experience. The nine women participating in the study had the usual characteristics of women who tend to breastfeed (married, college-educated, white, and upper to middle class), except for their ages, which ranged from 22 to 35 years. Themes emerging from the prenatal aspect of the study were importance of father's support, how the negative experience of the woman's social support network impacts self-efficacy, conflicting advice from health care providers, and environmental barriers like public breastfeeding. In comparison, the postpartum findings reinforced prenatal findings, for example, embarrassment of public breastfeeding and the impact of a nonsupportive social support network. There were new themes that emerged: breastfeeding is both easy and difficult; validating experiences gave them confidence to continue; and intention to

continue to breastfeed was based on how well breastfeeding was going. This qualitative study was able to examine attitudes and beliefs in a more in-depth way through open-ended questioning of women. The findings from this study highlight breastfeeding concerns that resonate with women who have characteristics of groups from all socio-economic levels.

Duckett et al. (1998) measured constructs of the Theory of Planned Behavior (including breastfeeding attitudes, beliefs, and knowledge) prenatally and compared that to postpartum breastfeeding behavior. The 605 participants represented a group of women who were largely of European descent, were having their first baby, and planning to breastfeed. The breastfeeding attitude and beliefs scale were the same scales used in this current study. The study participants were grouped according to their work status: homemaker, part-time employed, and full-time employed. For all groups, attitude toward breastfeeding, attitudes toward bottle feeding, and perceived behavioral control were directly associated with intention (number of weeks intending to breastfeed). For both groups of employed mothers, breastfeeding attitudes and bottle feeding attitudes were also significantly related to duration, as well as breastfeeding knowledge and education level. Homemaker's intention and perceived insufficient milk were the only variables directly related to duration.

Published Literature Reviews

A 1995 article (Losch, Dungy, Russill, & Dusidieker) reviewed studies dealing with the impact of attitudes on the breastfeeding decision, citing the ability of knowledge and attitudes to predict infant-feeding decisions. A variable such as attitude is one that it is amenable to change through interventions and so warrants further investigation.

Through a literature review, the authors identified the link between attitude and behavior, with intention mediating that relationship, reporting that indeed the intention to breastfeed is the strongest predictor of breastfeeding initiation. The intention to breastfeed is a decision that appears to be made prior to pregnancy or very early in pregnancy. Women who choose to formula feed often acknowledge that breastfeeding is healthier, but report they dislike the thought of breastfeeding. Embarrassment, pain, lifestyle restrictions, and concern over father participation are often cited as reasons for rejecting breastfeeding. Convenience is cited as one of the only positive reasons bottle feeding is chosen, although convenience is also a reason that some women choose to breastfeed. In contrast, women who choose to breastfeed, do so for positive reasons, such as, human milk being healthier, promoting bonding, and being more natural. Maternal attitudes have most often been studied in relation to initiation of breastfeeding rather than the duration of breastfeeding, although belief that breastfeeding is healthier and breastfeeding self-efficacy have been shown to have a positive relationship with duration (Losch, et al., 1995).

Other factors Losch et al. (1995) report as influencing infant feeding choices are social support, health provider's influence, maternity ward policies, fathers' attitudes, and children's attitudes. Fathers and children mirror mothers' attitudes in some respects, with more positive attitudes associated with knowledge about breastfeeding being healthier. Greater exposure to breastfeeding mothers influenced positive attitudes with children, while breastfeeding supportive fathers felt the impact of separation from baby and mother after the baby was born.

Scott and Binns (1999) review of literature focuses less on the psychosocial factors associated with breastfeeding, while attending to other factors that influence duration as well as initiation of breastfeeding. Prenatal breastfeeding intention and father's attitude is highlighted as important to the initiation and duration of breastfeeding. In relation to intention, the authors report: decision to breastfeed before pregnancy has positive effect on breastfeeding initiation; earlier the breastfeeding decision, the longer the duration; strong relationship between intended and actual breastfeeding duration.

Dennis (2002) published a literature review covering articles related to breastfeeding initiation and duration from 1990 to 2000. Positive breastfeeding attitudes were discussed using terms such as healthier, easier, more convenient, and more conducive to freedom. Negative breastfeeding attitudes were associated with terms such as lifestyle restrictions, physical discomfort, and inconvenience. Women were more likely to breastfeed if they had a positive attitude toward breastfeeding. Also feelings of embarrassment, shame, or modesty negatively affected breastfeeding initiation and duration. Strategies identified to enhance attitudes were (a) to improve women's prepregnancy and prenatal exposure to breastfeeding women; (b) use education or marketing approaches to dispel myths about perceived disadvantages; and (c) stimulate an attitude that champions the breastfeeding mother.

Adolescents and Young Adults

The adolescent's view of breastfeeding is important to understand because breastfeeding attitudes may be shaped very early. Forrester, Wheelock, and Warren (1997) surveyed high school and college students with a 20 question attitude instrument. Questions pertained to breastfeeding observations, perceived embarrassment, sources of

breastfeeding information, and impact of breastfeeding education. The majority of respondents perceived breastfeeding to be healthier and more convenient than bottle feeding, but also thought that embarrassment was a major factor that prevented women from breastfeeding. Most students thought that breastfeeding education could help change the perception that breastfeeding is embarrassing.

Martens (2001) surveyed 7th and 8th graders in a small Canadian Ojibwa community, using a randomized pretest-posttest control group design to elicit effects of a breastfeeding education intervention. Breastfeeding and bottle feeding attitudes and beliefs, along with questions pertaining to breastfeeding exposure, if self was breastfed, and future intention to breastfeed were measured. Beliefs positive toward breastfeeding were significantly increased in the intervention group as compared to the control group. There was no difference in the breastfeeding attitude measure. Associations between beliefs and attitudes to breastfeeding exposure were not tested.

Another study with adolescent participants measured breastfeeding attitudes and subjective norms and related those to demographic variables, such as their feeding method as an infant and exposure to breastfeeding (Goulet, Lampron, Marcil, & Ross, 2003). Participants who were breastfed as a baby, had siblings that were breastfed, and were exposed to breastfeeding had more positive attitudes toward breastfeeding. The adolescent study participants had positive scores on the Attitudes Toward Breastfeeding Advantages scale and disagreed with the statements on the Attitudes Toward Breastfeeding Inconveniences scale, indicating overall positive attitudes toward breastfeeding. There was one item on the Attitudes Toward Breastfeeding Inconveniences Scale that had a low score and that was the item pertaining to exposing

the breasts when breastfeeding in public. Males and females differed in their responses to the Attitudes Toward Breastfeeding Inconveniences scale, in that males were more likely to agree with the breastfeeding inconveniences. The authors concur that adolescent males could benefit from increased breastfeeding education.

Swanson, Power, Kaur, Carter, and Shepherd (2006) surveyed adolescents aged 11- 18 years to compare breastfeeding beliefs and future infant feeding intentions, based on knowledge and social influences. Not surprisingly, those who intended to breastfeed had more positive attitudes and were more likely to have been breastfed. The authors conducted a hierarchical regression (entering variables as a group into the regression equation) to examine social influence (exposure, subjective norm, social barriers, and socio-economic status) and breastfeeding knowledge on breastfeeding beliefs. Social barriers were measured by presenting different environments where breastfeeding might occur and participants marking a Likert scale from agree to disagree whether a person should breastfeed in that environment. Interestingly, when there were fewer perceived barriers to breastfeeding, those with more knowledge about breastfeeding did not score higher on breastfeeding beliefs. In other words, when adolescents perceive less social barriers to breastfeeding, even if they have less knowledge about breastfeeding, they still have more positive beliefs about breastfeeding. The authors concluded that breastfeeding promotion interventions focusing only on breastfeeding knowledge without including social barriers would be inadequate.

Construction of a theory-based (Theory of Planned Behavior) questionnaire to measure young people's attitudes to breastfeeding was the focus of a Giles, et al. (2007) article. The third phase of the research program was to pilot the questionnaire to 13-14

year olds. Descriptives and prediction of intention to breastfeed were among the findings derived from the data. Only 26% of females had observed a mother breastfeeding and those that had were more likely to state they intended to breastfeed their own baby. If the participants were breastfed themselves they were also more likely to state an intention to breastfeed their own. For males and females, 79% and 58% of the variance, respectfully, through regression analysis, was explained by attitude, subjective norm, self-efficacy, and perceived control.

Other studies have included measures of college-age participants on their breastfeeding attitudes. Forrester, Wheelock, and Warren (1997) surveyed college and high school students to investigate their breastfeeding perceptions. There were 20 multiple choice questions to assess attitudes with 6 questions pertaining to embarrassment as a barrier to breastfeeding. Of the college and high school student participants, 69% to 71% respectfully indicated embarrassment as a major factor that prevents women from breastfeeding. Most students had seen public breastfeeding and less than half thought it was acceptable. Participants were queried on acceptable locations for their own future baby to be breastfed. Locations where a fourth of the participants found as an acceptable location to breastfeed included: stranger's home; supermarket; mall; park; and church. Greater than half found the following locations as an acceptable place for a woman to breastfeed: relative's home, friend's home, public restroom, and physician's waiting room. Students appear to view the more public locations as less acceptable for breastfeeding than the private locations. The authors suggest that through educating school-aged children, breastfeeding can be accepted as the normal way to feed a baby, and embarrassment about breastfeeding will subside.

Kang, Song, and Im (2005) surveyed 340 university students in Korea to determine the relationship between breastfeeding knowledge, attitudes, and breastfeeding related experiences. No differences were found between those that were breastfed themselves and those that were not, based on their breastfeeding knowledge and attitude scores. There were also no differences noted between those that had previous breastfeeding exposure and those that did not on breastfeeding knowledge and attitudes. Breastfeeding exposure was measured by asking about observational experience of family or friends breastfeeding their babies. Most participants (76%) had no observational experience. Females had significantly higher scores on the breastfeeding knowledge and attitudes scales than the males. The authors suggest that gender differences should be considered when developing breastfeeding educational programs.

Tarrant and Dodgson (2007) have the most recent study of young people and their perceptions of breastfeeding. These authors had a convenient sample of university students in Hong Kong and measured their breastfeeding knowledge, attitudes, intention, and exposure. Exposure was calculated by asking whether the participant had been breastfed, knew anyone who had breastfed, and whether they had observed someone breastfeeding. Even though students had overall good knowledge and attitudes about breastfeeding, only 63% stated they intended to breastfeed their own baby. Just over half the respondents (61%) felt that breastfeeding in public was acceptable, but 80% thought it would be embarrassing. Not surprisingly, the participants who intended to breastfeed and had higher scores of breastfeeding exposure had significantly higher breastfeeding knowledge and attitudes. Logistic regression revealed that attitudes (OR 1.32), whether the person was breastfed or not, (OR 3.16) and knowing someone who breastfed (OR

1.77) were independently related to breastfeeding intention. The authors felt that breastfeeding knowledge was high enough in this group of non-childbearing students, but the lack of societal acceptance of breastfeeding is an issue that needs to be addressed in order to increase breastfeeding rates.

Most studies involving adolescents were from the U.S. with three from other countries, Canada (Martens, 2001), Korea (Kang et al., 2005), and Hong Kong (Tarrant & Dodgson, 2007). The U.S. studies often analyzed breastfeeding attitudes, including barriers such as embarrassment. The Canadian study measured breastfeeding beliefs before and after an education session. The Korean study as well as one U.S. study identified that males have a need for increased breastfeeding knowledge. The recent Hong Kong study finding that even with high breastfeeding awareness there was lack of social acceptance for breastfeeding may be helpful as the public consciousness about breastfeeding becomes more prevalent in the U.S.

Community

There have been several studies done using the Healthstyles Survey. The Healthstyles survey is a proprietary database product of Porter Novelli, a marketing and public relations firm licensed by the CDC for respondent analysis in health communication planning (2003). The sample of respondents in the Healthstyles Survey has been proven to match the U.S. census data and therefore reflects the general adult population in the U.S. Most recently, Li et al. (2007) used data from the Healthstyles survey and reported on the *Changes in Public Attitudes toward Breastfeeding in the United States, 1999-2003*. Due to the commonality of four breastfeeding questions in the 1999 and the 2003 Healthstyles survey the authors were able to compare the findings to

ascertain changes in attitudes toward breastfeeding. Respondents specified agreement or disagreement with the following statements: (1) Mothers who breastfeed should do so in private places only; (2) I am comfortable when mothers breastfeed their babies near me in a public place, such as a shopping center; (3) Feeding a baby formula instead of breastmilk increases the chances that baby will get sick; and (4) Infant formula is as good as breastmilk. Significant increases in agreement for statement #1 occurred for White respondents, those with low income households, and those with a high school degree or less. Significant decreases in agreement for statement #2 occurred for African Americans, women, those with low-income households, unemployed respondents, and those living in urban areas. All of the results indicated more discomfort with public breastfeeding in 2003 than in 1999.

The most striking finding was that there was a significant increase in all categories of respondents except those in New England and the Pacific areas for statement #4, which indicates that infant formula is believed to be as good as breastmilk. Agreement with statement #3 seems to be a contradictory declaration but can be illuminating in interpreting the complexity of community attitudes toward breastfeeding. The prevailing attitude among Americans across broad populations of ethnicity, income, education, and location is that feeding a baby formula increases the chance that the baby will get sick (statement #3), but that infant formula is as good as breastmilk (Li et al., 2007). Could the underlying belief to warrant such responses be that respondents feel that formula has the components of breastmilk but still doesn't offer the protection from sickness that breastmilk does? The authors suggest that increased advertising from formula companies related to the introduction of longchain polyunsaturated fatty acids to

formula and their marketing of formula as “like breast milk” has affected society’s attitudes and added to the drop in breastfeeding initiation rates from 70.1 % in 2002 to 66% in 2003 (Li et al.).

Hannan, Li, Benton-Davis, and Grummer-Strawn published a 2005 study that emphasized regional variation in public opinion about breastfeeding, using the Healthstyles survey. The U. S. was divided into nine regions, with North Dakota located in the West North Central region. Agreement with the following statements was used in the analysis and was pertinent to this current study: (1) Feeding a baby formula instead of breastmilk increases the chance the baby will get sick; (2) Breastfeeding is healthier for babies than formula feeding; (3) It is appropriate to show a woman breastfeeding her baby on TV programs; (4) I believe women should have the right to breastfeed in public. The West North Central region ranked 3rd in highest percentage agreeing with the first statement (24%, range 14-38%), 2nd with the second statement (72%, range 55-75%), 5th with the third (27.2%, range 20-36%) and fourth (41.3%, range 37-59%) statements. Interesting to note is that although up to 59 % of respondents believed women should have the right to breastfeed in public, only 36% agreed that it was appropriate to show a breastfeeding woman on a TV program. The media most often shows the erotic breast, rather than the nurturing breast, which may account for the lack of endorsement of breastfeeding on television. Conflicting agreement patterns were also noted with the statement that breastfeeding is healthier than formula feeding (high of 75%), as compared with the statement that feeding a baby formula instead of breastmilk increases the chance the baby will get sick (high of 38%). The American public appears willing to praise breastfeeding, but unwilling to criticize formula (Hannon et al.). Formula use is

widespread, even with breastfeeding babies, so it doesn't seem so farfetched that a respondent would be reluctant to criticize a product that he or she has used themselves. Will it take a person having a negative opinion of formula in order to decrease its use? By decreasing the use of formula (and not using other substitutes), breastfeeding by default would increase.

Li, Fridinger, and Grummer-Strawn (2002) published another study based on the 2000 Healthstyles survey. They identified 4 out of the 12 breastfeeding attitude statements where there was a high percentage agreement. Agreement with the statements implied a potential public health barrier. More than 25% of the respondents agreed with the following statements: "A mother who breastfeeds has to give up too many lifestyle habits like favorite foods, cigarette smoking, and drinking alcohol" (45%); "Babies ought to be fed cereal or baby food by the time they are 3 months old" (31%); "One-year-old children should not be breastfed by their mother" (31%); "It is embarrassing for a mother to breastfeed in front of others" (27%). Multivariate analysis was used to distinguish between males and females with the only statement that significantly differed being that fewer males thought "A mother cannot breastfeed her baby and work or go to school". The younger group (age 18-29) thought breastfeeding would tie a mother down and that breastfeeding was painful. The two older groups (45-64, >65) thought women have trouble making milk and that babies ought to be fed other foods by three months old. Those that consider breastfeeding in front of others to be embarrassing tended to have less than a high school education, were unmarried, and resided in the South Atlantic region of the U.S. The authors suggest that strongly promoting the perception that public

breastfeeding is a normal behavior is one way to help public breastfeeding become accepted.

The 2001 Healthstyles survey was the basis of a fourth Li study (Li, Fridinger, & Grummer-Strawn, 2004) which determined associations between breastfeeding policy endorsement and demographic characteristics. The most acceptable breastfeeding policies were establishing workplace breastfeeding policies and lactation rooms in public places. Forty-three percent of the respondents believed that employers should be flexible with work hours, provide a private location for breastfeeding or pumping, and extend maternity leave, all in support of breastfeeding. Those less than 30 years old were more likely to agree with those statements. Nearly the same percentage of respondents agreed that public buildings like shopping malls should provide lactation rooms (41%). While 43% agreed that women should have the right to breastfeed in public, only 28% agreed that it was appropriate to show a woman breastfeeding her baby on TV programs. Those with greater than a high school education had significantly higher agreement with the public and TV breastfeeding statements than those with less than a high school education. Men were also more likely to support breastfeeding in public, which contrasts with studies reviewed for this paper, where mates of pregnant women were usually less favorable toward public breastfeeding. The difference may be that mates of pregnant women may have been less favorable of public breastfeeding because the idea was personalized to their family member. Respondents less than 45 years old were also more favorable toward public breastfeeding.

McIntyre, Hiller, and Turnbull (2001) recorded the results from a large telephone survey that examined infant feeding attitudes and experiences of mothers, father,

grandmothers, and the general community in Northern Adelaide, Australia. Most notably were that the responses from the fathers, grandmothers, and the general community were not substantially different from each other in their support of breastfeeding. The authors concluded that there was little support for breastfeeding compared to bottle feeding. A closer examination of the survey reveals another interpretation of the data is possible. It would be difficult to disagree with the infant feeding statements, e.g. "Bottle-feeding means anyone can feed the baby" and "Bottle-feeding is more acceptable in public places". Agreement with these statements does not reflect more support for bottle feeding over breastfeeding as the authors suggest, but concurrence that the statements are true. In other findings the breastfeeding attitudes examined helped the authors identify barriers to breastfeeding. Those barriers included maternal physical discomforts, support needed, father's involvement, convenience of bottle feeding (others could feed the baby), and breastfeeding in public. Mothers were less comfortable about public breastfeeding than fathers and grandmothers were about observing public breastfeeding. Mothers and fathers, but not grandmothers were most likely to agree that a mother's decision to breastfeed is influenced by what she sees others do. This international study reported that the different members of the community (mothers, fathers, grandmothers) did not differ in their survey responses. The Healthstyles surveys do not distinguish between respondents based on family standing, but such information from the Australian study may be reassuring that there is no need to do so.

Summary

The clearest evidence to date suggests that women who are older, have higher incomes, and are more educated will be more likely to breastfeed their infants. However,

there are other important determinants of breastfeeding, particularly in groups that have a high initiation rate. If breastfeeding initiation rates are to increase, it is important to fully understand other predictors including attitudes, beliefs, and other social or cultural factors that may pose barriers to women breastfeeding (Scott et al., 2006). Scott et al. suggests that understanding breastfeeding attitudes in particular may be especially important for identifying women who are at risk for not breastfeeding. The attitudes and beliefs that a woman has towards breastfeeding affect her infant feeding choice as demonstrated by described research studies. The perceived or actual attitude of women's partners also is related to the initiation of breastfeeding. Attitudes toward breastfeeding are important whether it is the mother's attitude, the partner's attitude, or society's attitude.

Societal breastfeeding attitudes are postulated to impact women's infant feeding choices but have rarely been studied. The prevailing attitude that breastfeeding is embarrassing or that public locations are inappropriate for the act of breastfeeding are recurring themes in the measurement of breastfeeding attitudes. A study that surveys community attitudes about breastfeeding allows us to better understand women's views, but it also allows us to understand the views of women's partners, friends, and other family members. This ecological approach provides a fuller understanding of the potential personal and social influences that ultimately affect women's and their families' choices about infant feeding. The high rates in previous studies of both women and men suggesting that breastfeeding may be embarrassing to mothers and to observers, especially in public places, deserves special attention.

This study used data from a community sample to better understand the prevalence of various breastfeeding attitudes, beliefs, and experiences for both women

and men who also varied in their ages, incomes, occupations, and experiences with breastfeeding. Additionally, analyses were conducted to understand which sociodemographic and experiential factors best predicted positive breastfeeding attitudes and beliefs; positive and negative reactions to public breastfeeding; and actual breastfeeding initiation. This information should provide useful knowledge to health educators and health providers in developing strategies that increase positive breastfeeding attitudes, intentions, and ultimately, breastfeeding initiation and duration rates.

CHAPTER III

METHODOLOGY

An outline of the methods for the completion of this study is contained in this chapter. Population, study design, data collection methods, instrumentation, and proposed data analysis are described.

Population, Sample, and Data Collection

The population for this secondary analysis study consisted of students, faculty, staff, and administrators of a Midwestern public university (Peterson, 2006). The researcher, who was a Midwestern university graduate student, sent via online electronic listserves, invitations for participation in a survey examining respondents' breastfeeding and bottle feeding attitudes and beliefs, breastfeeding experiences, and feelings about the appropriateness of breastfeeding in various settings. The invitation contained a link that directed potential respondents to an informed consent and the survey. A second reminder was sent one week later. The data were collected beginning January 2006. The survey results were posted to a technology laboratory on the university campus which electronically tallied the results and provided the data set to the researcher. The data set was then made available to this author for the current study in February 2007. All students, faculty, staff, and administrators are signed up for the listservs, however, a substantial number of persons unsubscribe and therefore did not receive the surveys.

A convenience sample of 776 participants responded to the online questionnaire and were assigned a case number. Fourteen cases were missing all data points and

therefore were deleted. One additional case was deleted because all demographic data was missing. The final dataset contained 761 participants. Students were 63% of the total participants; 34% were faculty, staff, and administrators (FSA); and 3% of the sample did not identify their university status. Seventy percent of students and 75% of the FSA were women.

Instrumentation

The exact survey tool, *Infant Feeding Questionnaire*, used in this study had been previously used in another study, in a similar university community (O'Keefe et al., 1998). Items asked on the survey included demographic data consisting of gender, age, marital status, children and ages, highest degree earned, income, and employment status. Other variables surveyed included breastfeeding attitudes and beliefs, bottle feeding attitudes and beliefs, breastfeeding experiences and resulting feelings.

Breastfeeding and Bottle Feeding Attitudes

The attitudes portion of the survey was originally used and developed by Manstead, Plevin, and Smart (1984). Duckett et al. (1998) and O'Keefe et al. (1998) also used the instrument with Cronbach's alpha ranging from .89 to .90. In the current study, the reliability of the Breastfeeding and the Bottle Feeding Attitude Scales was also high with Cronbach's Alpha at .92 and .81, respectively. Content validity of the Attitude, Beliefs, and Breastfeeding Appropriateness in Various Settings scales was assessed by breastfeeding experts that developed the scales and breastfeeding experts that used the scales in subsequent research (Duckett et al., 1998; Manstead, Plevin, & Smart, 1984; O'Keefe et al., 1998). The tool used a semantic differential rating scale with items intending to measure the attitude toward the idea and the act of breastfeeding and bottle

feeding. A semantic differential scale is used to measure societal attitudes, specifically; a concept is featured whereby two opposing adjectives describing the concept are placed at either end of a seven point scale. The participant is asked to place a mark closest to the adjective that best describes his/her feeling about the concept: The higher the number the more positive the evaluative adjective. The adjective scales may be *Evaluative* (good/bad, healthy/unhealthy), *Potency* (strong/weak, rugged/delicate) or *Activity*, (fast/slow). The semantic differential used in this study is *Evaluative*, which is commonly used in studies of attitudes and values. The four concepts used for this study were the *Idea of Breastfeeding*, the *Act of Breastfeeding*, the *Idea of Bottle Feeding*, and the *Act of Bottle Feeding*. A combination of the two scales for breast and bottle feeding was created by combining the Idea and Act of Breastfeeding scale and by combining the Idea and Act of Bottle Feeding scale to arrive at a breastfeeding attitude score and a bottle feeding attitude score. There were six adjective pairs used in the semantic differential scale for each concept. The adjective pairs were unpleasant/ pleasant, embarrassing/not embarrassing, healthy/unhealthy, repulsive/attractive, convenient/inconvenient, and unnatural/natural. There were seven points on the scale between the adjectives where a mark was made that best represented participant's feeling about the concept based on the adjectives presented to them. A higher score represented more positive attitudes toward either of the two behaviors.

Breastfeeding and Bottle Feeding Beliefs

The beliefs about breastfeeding and formula feeding portion of the survey instrument was developed to measure a person's evaluation of the potential consequences for a mother and baby if that baby was breastfed or formula fed for six months or more.

Internal consistency reliability estimates were .86 and .85 for beliefs about outcomes of breastfeeding and bottle-feeding respectively in a previous study in which this scale was used (Ducket et al., 1998). In the current study, internal consistency reliability estimates were .89 and .88 for beliefs about outcomes of breastfeeding and bottle-feeding, respectively. Of the eighteen statements, seven are about infant physical health (baby will have few illness in the first year of life), six relate to mother-baby closeness (feedings will be a rewarding time), and five refer to maternal consequences (mother will return to her pre-pregnant weight within the year). Participants rated each potential outcome on a 7-point scale with endpoints of unlikely to likely. Responses were summed to come up with a Breastfeeding Beliefs score and a Bottle Feeding Beliefs score. Higher scores reflected belief in desirable outcomes of each of the two behaviors.

Breastfeeding Experiences

Breastfeeding experiences were measured by asking four questions: (1) Were you breastfed as an infant? (2) Did you observe breastfeeding as a child? Identify those persons observed, (3) Were any of your own children breastfed? Indicate overall satisfaction or dissatisfaction with breastfeeding, (4) Mark places (park, restaurant, etc.) where you have observed women breastfeeding their babies and indicate how you felt about the appropriateness of the occurrence (natural, neutral, inappropriate). The number of observed sites as a child were tabulated, as well as the number of overall observations of breastfeeding. A score to reflect reactions about appropriateness of public breastfeeding observed was determined, and was named Breastfeeding Appropriateness in Various Settings score. Reliability for the scale reflected good internal consistency with a Chronbach's alpha coefficient of .92.

Study Design and Analytic Strategy

The dataset was utilized to answer three primary research questions:

(1) What are the prevalences of breastfeeding experiences, attitudes, and beliefs in the student and faculty/staff/administrators (FSA) community samples? This question was answered by providing descriptive statistics of the following variables for the student and FSA groups: demographics (gender, age, marital status, children, highest degree earned, income, employment status); breastfeeding and bottle feeding attitudes (summary score); breastfeeding and bottle feeding beliefs (summary score); if breastfeeding observed as a child and number of types of persons observed; reaction to overall observations of breastfeeding in various settings (number of observations and Breastfeeding Appropriateness in Various Settings score); if self was breastfed; if own children were breastfed and satisfaction/dissatisfaction with the experience (satisfaction score).

Additionally, t-tests and chi-squares tests were used to examine any significant differences in the two groups on variables of interest including breastfeeding and bottle feeding attitudes (summary score), breastfeeding and bottle feeding beliefs (summary score), number of types of persons observed breastfeeding as a child; reaction to overall observations of breastfeeding in public settings (number of observations and Breastfeeding Appropriateness in Various Settings score); if self was breastfed; if own children were breastfed and satisfaction/dissatisfaction with the experience (satisfaction score). The significance level was set at .05 throughout the study.

(2) What are the demographic and experiential correlates of (a) positive breastfeeding attitudes and beliefs; and (b) respondents with children, having breastfed?

This question was answered by conducting two simultaneous linear regressions and one simultaneous logistic regression. In the first two analyses, the summary score of Breastfeeding Attitudes (Manstead et al., 1984) and the summary score of Breastfeeding Beliefs (Duckett et al., 1998) was regressed on the following variables: gender; age; education; income; marital status; if self was breastfed; number of types of persons observed breastfeeding as a child; and either Breastfeeding Attitudes (for the Breastfeeding Beliefs regression) or Breastfeeding Beliefs (for the Breastfeeding Attitudes regression).

Additionally, a logistic regression was conducted in which the dichotomous outcome variable “children breastfed” vs. “children not breastfed” was regressed on the same set of potential predictors as described above. The three regression models were conducted separately for students and for FSA.

(3) Because the prevalence of embarrassment about breastfeeding in public (operationalized as Breastfeeding Appropriateness in Various Settings score) has been high in previous studies, this study examined the issue in more detail by asking the question, “what are the demographic and experiential correlates of the Breastfeeding Appropriateness in Various Settings score for the two samples of respondents”? This question was answered by conducting a linear regression analyses in which the Breastfeeding Appropriateness in Various Settings score was regressed on the following potential predictor variables: gender; age; education; income; marital status; if self was breastfed; number of types of persons observed breastfeeding as a child; breastfeeding attitude score; and breastfeeding belief score. The statistical program used for data analysis was SPSS 11.0.

The methods used for analyzing the study data help provide interpretable results that were then able to be compared to results reported in the literature. There were results that concurred with literature findings and results that differed from literature findings. The following chapter will describe results obtained after conducting the described analyses.

CHAPTER IV

RESULTS

The purpose of this study was to describe and analyze the prevalence, patterns, and correlates among various breastfeeding attitudes and beliefs, bottle feeding attitudes and beliefs, experiences with breastfeeding, and feelings about viewing breastfeeding in various settings in both a student and adult (university employee) community sample from the Midwest. This chapter contains the following sections: a description of the sample in terms of demographics and breastfeeding related data; the reliability analysis of scales used to measure breastfeeding attitudes and beliefs; and the linear and logistic regression analysis used to construct the models of breastfeeding in relation to participants' experience, attitudes, beliefs, and feelings about viewing breastfeeding in various settings.

Description of Sample

This study utilized data from an online survey examining respondents' breastfeeding and bottle feeding attitudes and beliefs, breastfeeding experiences, and feelings about viewing breastfeeding in various settings. The invitation to participate contained a link that directed potential respondents to an informed consent and the survey. The survey results were posted to a technology laboratory on the university campus which electronically tallied the results and provided that information as a data set to a Midwest university researcher. The data set was then made available to this author for the current study in February 2007.

A convenience sample of 776 participants responded to the online questionnaire and were assigned a case number. Fourteen cases were missing all data and therefore were eliminated. One additional case was deleted because all demographic data was missing. The final dataset contained 761 participants. Demographic characteristics are presented in Table 1 and Table 2. There were 262 FSA (34.5%) and 492 Student (64.7%) respondents. The FSA group was made up of 108 Faculty (41%), 10 Administrators (4%), and 144 Staff (55%). Both FSA and Student groups had similar proportion of gender division with females composing 74.8% of the FSA group and 70.1% of the Student group. As expected, the FSA and Student groups differed significantly on marital status, having children, age, education and income. Almost 79% of FSA were married, while only 26% of students were married. The percentage of respondents having children was similar to the marital status (FSA, 78%; Students, 21%). The average age of FSA was 42.68 years ($SD=11.03$) and Students was 23.81 years ($SD=6.41$). Of the FSA group, 28% ($n=73$) had doctorate degrees, 23% ($n=59$) had master's degrees, 31% ($n=81$) had bachelor's degree, 12% ($n=33$) had associates degree, 5% ($n=14$) had high school education, and 1% ($n=2$) had a grade school education. In the Student group .2% ($n=1$) had doctorate degrees, 6.3% ($n=31$) had master's degrees, 19.3% ($n=95$) had bachelor's degree, 8.1% ($n=40$) had associates degree, 65% ($n=319$) had high school education, and 1% ($n=4$) had a grade school education

Table 1

Occupation, Gender, Marital Status, Parental Status of FSA and Student Groups

Characteristics		Faculty/Staff/ Administrator	Students
Employment Status		% 34.5 <i>n</i> 262	64.7 492
	Faculty	% 41 <i>n</i> 108	
	Staff	% 55 <i>n</i> 144	
	Administrator	% 4 <i>n</i> 10	
Gender	Female	% 74.8 <i>n</i> 196	70.1 345
	Male	% 25.2 <i>n</i> 66	29.7 146
Marital Status	Married	% 78.6 _a <i>n</i> 206	25.6 _b 126
	Not married	% 21.4 <i>n</i> 56	74.4 366
Have Children?	Yes	% 77.9 _a <i>n</i> 204	20.3 _b 101
	No	% 21.4 <i>n</i> 56	79.2 384

Note. Percents with different subscripts differ significantly at $p < .001$ by the chi square test.

Table 2

Age, Education, and Income of FSA and Student Groups

Characteristics		Faculty/ Staff/ Administrators	Students
Age	mean	42.68 _a	23.81 _b
	SD	11.03	6.41
	n	257	488
Education	mean	4.52 _a	2.66 _b
	SD	1.22	1.02
	n	262	490
Income	mean	7.97 _a	4.96 _b
	SD	2.15	2.94
	n	258	482

Note. Means with different subscripts differ significantly at $p < .001$ by the Independent samples t-test.

Age expressed in years. For education: 1=grade school, 2=high school, 3=associate's, 4=bachelor's, 5=master's, 6=doctoral. For income in 1000's: 1 = <5, 2 = 5-9.9, 3 = 10-19.9, 4 = 20-29.9, 5 = 30-39.9, 6 = 40-49.9, 7 = 50-59.9, 8 = 60-69.9, 9 = 70-79.9, 10 = 80 and up.

Breastfeeding and Bottle Feeding Attitudes

Table 3 presents the scores for Breastfeeding and Bottle Feeding Attitude scales, in addition to the Breastfeeding and Bottle Feeding Beliefs scale. The attitude scales used a semantic differential rating scale with items intending to measure the attitude toward the idea and the act of breastfeeding and bottle feeding, the higher the number the more positive the evaluative adjective. The adjective pairs were unpleasant/ pleasant, embarrassing/not embarrassing, healthy/unhealthy, repulsive/attractive, convenient/inconvenient, and unnatural/natural. There were seven points on the scale between the adjectives where a mark was made that best represented participant's feeling about the concept based on the adjectives presented to them.

Table 3

Breastfeeding Attitude, Bottle Feeding Attitude, Breastfeeding Beliefs, Bottle Feeding Beliefs for FSA and Student Groups

Scale		Faculty/Staff/ Administrators	Students
Breastfeeding Attitude	mean	5.90 _a	5.62 _b
	SD	1.06	1.15
	n	260	477
Bottle Feeding Attitude	mean	5.02 _a	4.72 _b
	SD	1.16	1.24
	n	257	467
Breastfeeding Beliefs	mean	5.54	5.61
	SD	.894	.834
	n	258	457
Bottle Feeding Beliefs	mean	4.04 _a	3.71 _b
	SD	.780	.894
	n	253	427

Note. Means with different subscripts differ significantly at $p < .01$ by the Independent Samples t-test.

For Breastfeeding and Bottle Feeding Attitude Scale: Scores could range from 1-7 with higher numbers indicating more favorable Breastfeeding or Bottle Feeding attitudes. For Breastfeeding and Bottle Feeding Beliefs Scale: Scores could range from 1-7 with higher scores indicating more favorable Breastfeeding or Bottle Feeding beliefs.

The four scales used for this study were the Idea of Breastfeeding, the Act of Breastfeeding, the Idea of Bottle Feeding, and the Act of Bottle Feeding. Correlations between the Idea and Act of Breastfeeding scales, as well as between the Idea and Act of

Bottle Feeding scales were high (.904 and .912 respectively), indicating that a combined score between the Idea and Act of either Breastfeeding or Bottle Feeding was justified to present a more efficient way of presenting the Breastfeeding Attitude scores.

Combination of the two scales for breast and bottle feeding was created by combining the Idea and Act of Breastfeeding scale and by combining the Idea and Act of Bottle Feeding scale to come up with a Breastfeeding Attitude score and a Bottle Feeding Attitude score.

Average scores for the Breastfeeding and Bottle Feeding Attitudes scales could range from 1-7 with higher numbers indicating more favorable breastfeeding or bottle feeding attitudes. FSA and Students had favorable scores toward both breastfeeding and bottle feeding attitudes. The highest favorable scoring of the two groups for the two scales was FSA with a mean of 5.9 (SD=1.06) for the Breastfeeding Attitude scale, which was significantly higher than the Student's Breastfeeding Attitude score at 5.62 (SD=1.15). FSA also had a significantly higher Bottle Feeding Attitude mean at 5.02 (SD=1.16), with Students at 4.72 (SD=1.24). Differences were significant at the $p < .01$ level.

Breastfeeding and Bottle Feeding Beliefs

The Beliefs about Breastfeeding and Bottle Feeding portion of the survey instrument (refer to Table 3) was used to measure a person's evaluation of the potential consequences for a mother and baby if that baby was breastfed or formula fed for six months or more. Of the eighteen statements, seven were about infant physical health (*baby will have few illnesses in the first year of life*), six relate to mother-baby closeness (*feedings will be a rewarding time*), and five refer to maternal consequences (*mother will return to her pre-pregnant weight within the year*). Participants rated each potential outcome on a 7-point scale with endpoints of unlikely to likely. Responses were averaged

to come up with a Breastfeeding Beliefs score and a Bottle Feeding Beliefs score. Higher scores reflected belief in desirable outcomes of each of the two behaviors, with scores ranging from 1-7. The Breastfeeding Beliefs scores for FSA and Students were very similar at 5.54 ($SD=.89$) and 5.61 ($SD=.834$), respectively. Bottle Feeding Beliefs were significantly different ($p<.01$) at 4.04 ($SD=.78$) for FSA and 3.83 ($SD=.89$) for Students. Results are presented in Table 3.

Breastfeeding Experiences

Breastfeeding experiences were measured by asking a series of questions regarding breastfeeding behaviors, observations and feelings. The results are presented in Tables 4, 5, and 6. FSA and Students with children were similar in that around 85% of each group had a breastfed child ($n=176$, 85.9% and $n=82$, 84.5%, respectively). The two groups did differ in the level of satisfaction with breastfeeding (Table 4). The Students ($M=6.47$, $SD=1.01$) had a higher satisfaction level with breastfeeding than did the FSA group ($M=5.87$, $SD=1.50$). Satisfaction with breastfeeding was measured on a Likert scale from 1-7 with numbers 4-7 reflecting some degree of satisfaction and numbers 1-3 representing some level of dissatisfaction, so while both groups were satisfied with breastfeeding, the Student group had significantly greater satisfaction than the FSA group. There was no significant difference in the FSA and Student groups in the observation of breastfeeding as a child (Table 5). Sixty-six percent ($n=173$) of the FSA group had observed breastfeeding as a child and 71.1% ($n=350$) of the Student group had observed breastfeeding as a child.

Table 4

Number of Breastfeeding Setting Observations, Breastfeeding Appropriateness in Various Settings, Childhood Breastfeeding Observations, and Satisfaction with Breastfeeding for the FSA and Student Groups

Scale		Faculty/Staff/ Administrator	Students
Number of Breastfeeding Setting Observations			
	mean	8.38	8.08
	SD	1.77	2.36
	n	262	492
Breastfeeding Appropriateness in Various Settings			
	mean	2.45 _a	2.29 _b
	SD	.46	.48
	n	257	465
Number of Types of Childhood Breastfeeding Observations (CBO)			
	mean	1.24 _a	1.56 _b
	SD	1.21	1.36
	n	262	492
Satisfaction with Breastfeeding			
	mean	5.87 _a	6.47 _b
	SD	1.50	1.01
	n	172	89

Note. Means with different subscripts differ significantly at $p < .001$ by the Independent Samples t-test. For # of Breastfeeding Setting Observations: Numbers could range from 0-9 with higher numbers indicating more Breastfeeding setting observations. For Breastfeeding Appropriateness Setting Score: Average scores could range from 1-3 with lower numbers indicating more feelings about various settings being inappropriate for Breastfeeding. For # of Types of Childhood Breastfeeding Observations: Scores could range from 0-5 with higher scores indicating more Childhood Observations of Breastfeeding. For Satisfaction with BF: Scores could range from 1-7 with higher numbers indicating more satisfaction.

Table 5

Children and Breastfeeding in FSA and Student Groups

Characteristics			Faculty/Staff/ Administrator	Students
Any of own children breastfed?	Yes	%	85.9	84.5
		<i>n</i>	176	82
	No	%	14.1	15.5
		<i>n</i>	29	15
Breastfed as an infant?	Yes	%	38.5 _a	67.3 _b
		<i>n</i>	101	331
	No	%	60.7	29.5
		<i>n</i>	159	145
Observe Breastfeeding when you were a child?	Yes	%	66.0	71.1
		<i>n</i>	173	350
	No	%	32.8	25.4
		<i>n</i>	86	125

Note. Percents with different subscripts differ significantly at $p < .001$ by the Chi Square test

There was a significant difference in the number of different persons (mother, other relative, stranger, family friend, other) seen breastfeeding in childhood between the Student and FSA groups (Table 4). The Student group reported seeing between 1 and 2 different persons breastfeeding ($M=1.56$, $SD=1.36$). The FSA group reported a lesser number ($M=1.24$, $SD=1.21$). There was a significant difference on whether the

respondents in the two groups had been breastfed as an infant (Table 5). A higher percentage of the Student group ($n=331$, 69.5%) had been breastfed as an infant than the FSA group ($n=101$, 38.8%).

The number of breastfeeding setting observations was not significant between the two groups (Table 4). FSA reported observing breastfeeding in 8.38 settings ($SD=1.77$), while students reported a mean of 8.08 settings ($SD=2.36$). The average rating on the nine settings based on the following scale: inappropriate=1; neutral=2; and natural=3, was significant between the two groups (Table 4). Students had an average rating of 2.29 ($SD=.48$), while FSA had an average rating of 2.45 ($SD=.46$). Interesting to note is that the average rating in both groups tended toward neutral, indicating breastfeeding in public places is not viewed as a natural occurrence.

Of particular interest to note is the percentage of respondents that marked public places as inappropriate for breastfeeding. Results are presented in Table 6. One third to one half of the Student group marked school (33.7%), church (29.9%), mall (37%), and restaurant (45.1%) as inappropriate settings for breastfeeding. Restaurant was the only public place where approximately one fourth to one third of the FSA group (26.3%) marked as inappropriate.

Table 6

Breastfeeding Appropriateness in Various Settings for FSA and Student Groups

Setting	Scale	FSA		Students	
		<i>n</i>	Percent	<i>n</i>	Percent
Infant Home	Inappropriate	1	.4	3	.7
	Neutral	16	6.3	26	5.7
	Natural	237	93.3	427	93.6
	Total	254	100	456	100
Relative Home	Inappropriate	4	1.6	6	1.3
	Neutral	43	16.9	112	24.9
	Natural	207	81.5	332	73.8
	Total	254	100	450	100
School	Inappropriate	46	19.7	166	39
	Neutral	111	47.6	169	39.7
	Natural	76	32.6	91	21.4
	Total	233	100	426	100
Church	Inappropriate	50	21.5	147	33.6
	Neutral	96	41.2	155	35.4
	Natural	87	37.3	136	31.1
	Total	233	100	438	100
Mall	Inappropriate	55	22.8	182	41.7
	Neutral	109	45.2	141	32.3
	Natural	77	32	113	25.9
	Total	241	100	436	100
Restaurant	Inappropriate	69	28	222	49.9
	Neutral	96	38	125	28.1
	Natural	81	32.9	98	22
	Total	246	100	445	100
Park	Inappropriate	29	12	100	22.7
	Neutral	90	37.2	175	39.7
	Natural	123	50.8	166	37.6
	Total	242	100	441	100

Table 6 cont

Setting	Scale	FSA		Students	
		<i>n</i>	Percent	<i>n</i>	Percent
Car	Inappropriate	22	8.9	38	8.7
	Neutral	67	27	167	38.4
	Natural	159	64.1	230	52.9
	Total	248	100	435	100
Hospital	Inappropriate	3	1	3	.6
	Neutral	29	11.8	54	11.4
	Natural	216	88.2	397	88
	Total	245	100	451	100

Predictors of Breastfeeding in Participants with Children

Simultaneous logistic regression was conducted with FSA and Student groups to determine which independent variables were predictors of whether a respondent breastfed at least one child. Results are presented in Tables 7 and 8. Selection of independent variables entered into the regressions was based on variables most often cited as important to breastfeeding in the literature. The only significant predictor was Breastfeeding Beliefs in the FSA group at $p < .05$. The odds of someone who reports breastfeeding is almost two times higher for those with a more positive breastfeeding belief. Results for the Student group indicate there were no significant predictors of breastfeeding a child (Table 8).

Predictors of Positive Breastfeeding Attitudes and Beliefs

Two linear regression analyses were conducted for each group (FSA and Students) to determine how well a set of predictor variables correlated with positive breastfeeding attitudes and with positive breastfeeding beliefs. Independent variables

were entered simultaneously. Table 9 shows that the overall model accounted for approximately 40% of the variance in Breastfeeding Attitudes for the FSA group. Only age and Breastfeeding Beliefs were significant predictors. The unique variance explained by the two model predictors was led by the Breastfeeding Belief score (33% of the total variance in Breastfeeding Attitudes is uniquely explained by the Breastfeeding Belief score), followed by age (2%).

Table 7

Logistic Regression Analysis Predicting Breastfeeding in a University Sample of Faculty, Staff, and Administrators with Children

Predictor Variables	B	SE	Adjusted Odd Ratio	95% CI
Breastfeeding Beliefs	.663*	.322	1.94	1.03-3.65
Age	-.049	.025	.952	.907-1.0
Educ	.118	.247	1.125	.694-1.825
Income	.220	.138	1.246	.951-1.633
Gender	.060	.661	1.062	.291-3.878
Marital	.645	.828	1.907	.377-9.654
Self breastfed	-.904	.564	.405	.134-1.224
Number of types Of CBO's	-.147	.215	.863	.566-1.317
Breastfeeding Attitudes	.474	.269	1.607	.948-2.722

Note. *, $p < .05$

Table 8

Logistic Regression Analysis Predicting Breastfeeding in a University Sample of Students with Children

Predictor Variables	B	SE	Adjusted Odd Ratio	95% CI
Breastfeeding Beliefs	.8.816	6.147	6738.009	.039-1.15E+09
Age	.836	.646	2.307	.651-8.177
Educ	.785	1.003	2.192	.307-15.637
Income	-3.241	2.006	.039	.001-1.994
Gender	7.636	5.003	2072.399	.114-3761115
Marital	-6.771	4.071	.001	.000-3.347
Self breastfed	-7.347	5.573	.001	.000-35.679
Number of types Of CBO's	-1.810	1.157	.164	.017-1.581
Breastfeeding Attitudes	3.145	1.881	23.214	.582-925.679

Note. *, $p < .05$; **, $p < .01$; ***, $p < .001$

Results for the Student group in Table 9 indicated an overall model that accounted for approximately 39% of the variance in Breastfeeding Attitudes. Age, gender, number of types of childhood breastfeeding observations, and Breastfeeding Beliefs were significant predictors for Breastfeeding Attitudes. The unique variance explained by the four predictors was age (3%), gender (1%), number of types of childhood breastfeeding observations (2%), and Breastfeeding Beliefs (22%).

Analyses to explain the Breastfeeding Beliefs score for the FSA and Student groups was also performed, with results in Table 10. For the FSA group, regression results indicate an overall model that accounts for 38% of the variance in Breastfeeding Beliefs. Gender and Breastfeeding Attitude scores were significant predictors. The unique variance explained by the two model predictors was led by the Breastfeeding Attitude score (33% of the total variance in Breastfeeding Beliefs is uniquely explained by the Breastfeeding Attitude score), followed by gender (2%).

Table 9

Linear Regression Analyses Predicting Positive Breastfeeding Attitudes in FSA and Student Groups

Group	Predictor Variables	B	SE	BETA	Part Correlation	t
FSA	Age	.015	.005	.153	.148	3.018**
	Breastfeeding Beliefs	.699	.060	.591	.571	11.645***
Students	Age	.043	.009	.055	.171	4.638***
	Gender	.302	.095	.120	.117	3.167**
	Number of Types of CBOs	.134	.033	.158	.149	4.039***
	Breastfeeding Beliefs	.675	.053	.488	.467	12.649***

Note. *, $p < .05$; **, $p < .01$; ***, $p < .001$

Table 10

Linear Regression Analyses Predicting Positive Breastfeeding Beliefs in FSA and Student Groups

Group	Predictor Variables	B	SE	BETA	Part Correlation	t
FSA	Gender	-.335	.108	-.163	-.153	-3.091**
	Breastfeeding Attitude	.511	.044	.605	.578	11.645***
Students	Education	-.080	.039	-.097	-.080	-2.049*
	Income	-.027	.011	.094	-.090	-2.316*
	Breastfeeding Attitudes	.395	.031	.546	.494	12.649***

Note. *, $p < .05$; **, $p < .01$; ***, $p < .001$

Results for the Student group indicated an overall model that explained 32% of the variance in Breastfeeding Beliefs. Education, income, and Breastfeeding Attitudes were significant predictors. The unique variance explained by the three predictors were Breastfeeding Attitude score (24%), education (1%), and income (1%). Table 10 presents relevant statistics for the model.

Predictors of Breastfeeding Appropriateness in Various Settings

Linear regression analysis was performed with the FSA and Student groups to determine how well a set of predictor variables correlated with higher Breastfeeding Appropriateness in Various Settings scores. Table 11 presents relevant statistics for the regression model. Results for the FSA group indicated an overall model that explained 36% of the variance. A significantly explained the Breastfeeding Appropriateness in Various Settings score. The unique variance explained by breastfeeding attitude was 20%.

Student group regression results indicated an overall model that explained 41% of the variance in the Breastfeeding Appropriateness in Various Settings score. There were five predictors (age, education, number of childhood breastfeeding observations, Breastfeeding Attitudes, Breastfeeding Beliefs) that significantly predicted the Breastfeeding Appropriateness in Various Settings score. The unique variance explained by the five predictors were age (3%), education (3%), number of breastfeeding observations as a child (2%), Breastfeeding Attitudes (6%), and Breastfeeding Beliefs (1%). Discussion of the results will follow in Chapter V.

Table 11

Linear Regression Analyses Predicting Breastfeeding Appropriateness in Various Settings for FSA and Student Groups

	Predictor Variables	B	SE	BETA	Part Correlation	t
FSA	Breastfeeding Attitude	.250	.028	.578	.443	8.775***
Students	Age	.020	.004	.262	.185	5.055***
	Education	.075	.021	.158	.130	3.542***
	Number of Types of CBOs	.051	.014	.145	.134	3.661
	Breastfeeding Attitudes	.134	.020	.322	.250	6.820***
	Breastfeeding Beliefs	.060	.025	.103	.085	2.313*

Note. *, $p < .05$; **, $p < .01$; ***, $p < .001$

CHAPTER V

DISCUSSION

Breastfeeding is recognized by scientists and health care professionals as the healthiest way to feed a newborn infant. Scientific knowledge about breastmilk and breastfeeding generated in the last 20 years has attracted the attention of the population in general and made a difference in breastfeeding initiation and duration rates. The latest U.S. breastfeeding initiation rate of 72.9% (CDC, 2007) is still below the Healthy People 2010 goal of having at least 75% of babies ever breastfed. The other indicators, breastfeeding at six months and twelve months, are further below the Healthy People 2010 breastfeeding goals of 50% at six months (2005 rate at 39%) and 25% at twelve months (2005 rate at 20%). From the ecological model (Bronfenbrenner, 1979) and Bandura's social cognitive theory of behavior (Bandura, 1977), it is believed that individual's learning is influenced by his/her environment. Informal learning may take place unconsciously and may be taken for granted because it occurs when simply talking to others and/or observing behaviors and outcomes of a behavior. The concept of informal learning is that learning takes place in everyday encounters while individuals interact with their environments. It is those personal and environmental factors that influence behavior. Community members' breastfeeding behaviors and reactions to breastfeeding influence others in the social space they occupy, making them a part of the web of informal learning. Community members that are knowledgeable and supportive of breastfeeding can positively influence the health-significant decisions made by

individuals. Learning about breastfeeding attitudes and beliefs of a community is integral to understanding breastfeeding behavior of individuals.

The current study describes the community sample from a university setting, comparing a group of adults who were Faculty, Staff, and Administrators to a group of Students. Individual characteristics of the two groups, their breastfeeding and bottle feeding beliefs and attitudes, and their exposure to breastfeeding were compared to their breastfeeding behavior for the purpose of increasing understanding of breastfeeding attitudes and behavior. Findings from this study, which will highlight the links between breastfeeding perceptions of a community population and their breastfeeding behaviors, will provide information to policy makers and clinicians for developing educational programs and crafting strategies to improve breastfeeding rates.

The findings from this current study reflect the population from which the sample was obtained, that of university employees and students. Not surprising was the finding that the FSA and Student respondents differed significantly on marital status, having children, age, education, and income. Income was higher than expected with a student population, at almost \$50,000/year family income. Family income for the FSA was close to \$80,000/year. Significant differences between the two groups were expected on indicated variables with the high level of income for both groups unexpected.

The gender of those responding to the survey was not different among the two groups, with 71.3% of the sample being female. There was a much higher percentage of females responding to the survey than males.

Breastfeeding Attitudes, Bottle Feeding Attitudes, and Bottle Feeding Beliefs were all significantly different among the FSA and Student groups with Breastfeeding

Beliefs showing no significant difference. The Breastfeeding Belief items reflect more knowledge about breastfeeding rather than feelings about breastfeeding, indicating the FSA and Student groups are similar in their breastfeeding knowledge. The highest scores, which reflected more favorable attitudes or beliefs on either breastfeeding or bottle feeding were the Breastfeeding Attitude score of FSA and Students. The score of the FSA respondents was significantly higher than the Student respondents' score. The adjective pairs were mostly a rating of feelings about breastfeeding, where the breastfeeding beliefs were statements that reflected more knowledge about breastfeeding (e.g. *The baby will experience few illnesses during the first year; The baby will have good jaw and facial development.*) It appears that the FSA had stronger positive attitudes about breastfeeding than the Student group, but that both groups had similar knowledge and beliefs about breastfeeding.

The literature commonly reports higher breastfeeding rates associated with demographic characteristics of older age, higher education, and higher income (Rose et al., 2004), but rarely reports breastfeeding attitude analyzed in relation to those same variables. An indirect link between positive breastfeeding attitudes and these demographic variables can be hypothesized as the literature does report that breastfeeding initiation is related to those variables, as well as being related to more positive breastfeeding attitudes (Dungy et al., 1994; Ryser, 2004). The current study finding that the FSA group had more positive breastfeeding attitudes than the Student group may be because the FSA respondents were older, more educated, and had higher incomes. The current study findings differ from previous literature in that there is no difference between the FSA and Student groups on breastfeeding initiation rates. The explanation

for this finding could be that even though education and income differ significantly, the Student group is in the process of obtaining higher education and actually have a relatively high family income, all of which may offset the tendency to have lower rates of breastfeeding initiation.

Bottle Feeding Beliefs were significantly different between the two groups with Student respondents tending to rank items as unlikely and FSA respondents tending to rank items as neutral (items such as *the baby will experience few illness, during the first year* were ranked from likely to unlikely, with neutral being the middle selection). Bottle Feeding Attitude items were ranked more positively with the average mean of the items falling toward the positive end of the scale for both groups, even though FSA scores were significantly higher than Student scores. Student respondents were more negative about Bottle Feeding (Attitudes and Beliefs) than FSA respondents, but FSA respondents were more positive in their attitudes about breastfeeding. The two groups were similar in their Breastfeeding Beliefs. What does this say? Because the students were more negative about formula, the message about superiority of breastmilk and inferiority of formula may have been heard by this group of students. The older group of FSA respondents has heard mixed messages about infant feeding throughout their life, as formula enjoyed an equal position with breastfeeding as late as the early 1980s. So even though the FSA group has stronger positive attitudes toward breastfeeding, the Student group has stronger negative feelings toward bottle feeding. This finding would support the Health and Human Services Department 2003 plan to use an edgy advertising campaign to graphically show the risks of using formula before that strategy was softened as a result of heavy lobbying by the formula industry (Kaufman & Lee, 2007).

The Student respondents reported more types of childhood breastfeeding observations than the FSA respondents, reflecting the increased breastfeeding rates in the late 1980's. Students had more childhood opportunities to observe breastfeeding because there were more women breastfeeding than when the FSA respondents were children. FSA and Student groups had observed breastfeeding in various settings, both in childhood and as adults. Approximately two thirds of the total sample had observed breastfeeding as a child. Also reflective of the increased rates of breastfeeding when students were infants was the significantly higher percentage of Student respondents that were breastfed as infants than FSA respondents. Approximately two-thirds of the Student group was breastfed as an infant compared to about one third of the FSA group.

When questioned about any of their own children being breastfed, there was no significant difference between the two groups. About 85% of the total respondents who had children, reported breastfeeding. The 2005 breastfeeding rate for the Midwestern state where the survey was conducted had a breastfeeding rate of 73.1%, which reveals that the convenience sample of respondents completing the survey had a higher rate of breastfeeding than the state population (CDC, 2007). There was a significant difference between FSA respondents and Student respondents on their satisfaction with the breastfeeding experience. Students ranked satisfaction with breastfeeding at a higher level than did FSA, although both groups were satisfied with their breastfeeding experience. Student respondents who breastfed, did so at a time when there were more women breastfeeding and likely were breastfeeding in a more supportive environment, than when the FSA respondents were breastfeeding.

One of the more interesting findings of the current study was the response to the questions about the appropriateness of nine settings where breastfeeding was observed. Those questions formed the Breastfeeding Appropriateness in Various Settings score. Settings ranged from relatively private places (infant's home, relative's home, car, hospital) to public places (school, church, mall, restaurant, park). The overall FSA mean was significantly higher than the Student mean, indicating that FSA respondents were more likely to view all settings as a natural place in which to breastfeed a baby than Student respondents were. One way to view the finding is to acknowledge that the FSA group compared to the Student group has lived longer and thereby been exposed to more breastfeeding situations, which could be the reason for their more tolerant perception of appropriate places to breastfeed. A further interpretation could be that Student respondents, even though having grown up in a time when more babies were being breastfed, were also more likely to be exposed to sexualized images of breasts from an earlier age. To the Student respondents the idea of breasts in public (independent of whether or how much breast is actually exposed), even as part of a breastfeeding entity, may denote a sexual connotation rather than a nurturing representation.

Students who had children had significantly higher means on the Breastfeeding Appropriateness in Various Settings scale than Students who did not have children. Also, Students who had breastfed children had significantly higher means on the Breastfeeding Appropriateness in Various Settings scale than Students who had children that were not breastfed. Those with children, especially those with breastfed children have more familiarity or personal experience with breastfeeding in public settings, which may account for their more positive ratings of public breastfeeding.

Respondents appeared to distinguish between the more private places and the more public places for breastfeeding, as their ratings for the more public places were slanted toward the “inappropriate” or “neutral” rating. The FSA respondents’ mean for breastfeeding in public places (school, church, mall, restaurant, and park) was significantly different from the Student respondents’ mean. The FSA group was more likely to view public places for breastfeeding in a neutral manner than was the Student group, who had more respondents viewing public places as inappropriate for breastfeeding. The means for breastfeeding in more private places (infant’s home, relative’s home, car, hospital) were not significantly different between the two groups.

Even with the FSA group there was marked differences in the mean scores of the more private settings versus the more public settings. The relatively private settings had a higher mean which denoted appropriate ratings. The Student group also showed marked differences in their scores between the more private and the more public settings with the private settings rated as more appropriate for breastfeeding. Both groups felt that the more private settings were more appropriate for breastfeeding than the more public settings. About one-third of the Student group marked school (39%), church (33.6%), and mall (41.7%) as inappropriate settings for breastfeeding, with almost one-half marking restaurant (49.9%) as inappropriate for breastfeeding. A little more than one-fourth of the FSA group marked restaurant as an inappropriate setting for breastfeeding (28%).

The respondents in this study had a higher rate of breastfeeding than the general population and had high scores on the Breastfeeding Attitude and Breastfeeding Beliefs scales, yet a noteworthy number of them felt that public settings were an inappropriate place for breastfeeding to occur. This finding is similar to the finding by Pollock et al.

(2002) that approximately one third of the men sampled (81% of whom wanted their children to be breastfed) disagreed that breastfeeding in public was acceptable.

Restaurant was the setting that received the most negative responses from respondents in both the FSA and Student groups. The reason may be that breastmilk, as a body fluid, has contaminant connotations. On the contrary, breastmilk is exempted from hospital Standard Precautions (Lawrence & Lawrence, 2005). Standard Precautions is a procedure that is used to prevent contact with all body fluids regardless of actual or perceived risks. An overview of breastfeeding surveys and/or breastfeeding educational content from references used in this research study reveal only one mention of breastmilk in conjunction with contamination being a factor in inappropriate public breastfeeding views and it was not part of educational or survey content (Swanson et al., 2006). It appears that breastmilk precautions is ignored in the breastfeeding attitude literature, but may in fact be one source of discomfort with public breastfeeding. Women are aware that breastfeeding in public is viewed negatively by some and consequently that perception may have an effect on a person's exclusivity and/or duration of breastfeeding or even choice of feeding method (Guttman & Zimmerman, 2001). It seems that this small issue may have important ramifications when considering the impact of community norms on breastfeeding.

The myth of breastmilk precautions may play a role in the inappropriate rating of other public settings as well, but is probably less of a factor considering that restaurant was the most highly inappropriate rated setting. Certainly negative reactions to breastfeeding in other public settings have been publicized and resulted in state and national laws passed to insure that women have the right to breastfeed wherever they

have the right to be (Vance, 2005). There may well be several issues involved in understanding the opposition to breastfeeding in public settings, the more acknowledged one being the individual moral, emotionally influenced, and sexuality based opposition (Swanson, et al., 2006). Some suggested interventions to increase acceptability of public breastfeeding have been to expose the community to more women breastfeeding through media advertising, encouraging businesses to denote their places as breastfeeding friendly, and to encourage the TV media to show positive public breastfeeding images (McIntyre et al., 2001; Swanson et al., 2006). I would suggest that further research done to determine the reason behind community members' feeling that some settings are inappropriate for breastfeeding would be a new addition to the breastfeeding literature.

Related to the issue of breastfeeding in public is the emergence in recent years of "family friendly restrooms", which typically have an outer lounge room with comfortable seating accommodations. Other similar rooms established as "Lactation Rooms" have also increased. The room can be a welcome respite for the woman who wants to breastfeed in a more private area, but has been criticized by some as a way to hide what should be a normal public activity.

It was thought by this author that Breastfeeding Appropriateness in Various Settings would be related to the Breastfeeding Attitude item, "the idea of breastfeeding is embarrassing". This did not hold to be true. Eighty percent of the total respondents classified breastfeeding as not embarrassing, whereas only 37% felt that breastfeeding in public was appropriate. It appears that respondents answered the question exactly as written and felt that breastfeeding in general was not embarrassing. The response to "breastfeeding is not embarrassing" may have had a different answer had the query been

further categorized as “breastfeeding in public is not embarrassing”. The participants in a study by Pollock et al. (2002) reported that “embarrassment” and “appropriateness” were more closely connected. Those who thought breastfeeding was not embarrassing also thought that breastfeeding in public was acceptable. For future studies using the current instruments, I would change or add to the query about embarrassment to clarify public breastfeeding as embarrassing or not.

The common significant predictor for both FSA and Student groups on Breastfeeding Attitude, Breastfeeding Belief, and Breastfeeding Appropriateness in Various Settings regression models was either Breastfeeding Attitude or Breastfeeding Beliefs. This finding supports what is found in the literature (Swanson et al., 2006): those persons who have a more positive breastfeeding attitude tend to have more positive beliefs about breastfeeding and tend to be less negative about breastfeeding in public.

Breastfeeding Attitude was also significant for predicting whether a respondent breastfed or not in the FSA group, controlling for demographic variables of age, education, and income. How a person feels about breastfeeding (attitude) and the beliefs they have about breastfeeding (including knowledge) appear to have the biggest impact on whether a person breastfeeds or not, which is upheld in the literature (Dungy et al., 1994; Shaker et al., 2004). It is important to note that positive breastfeeding attitudes and initiation of breastfeeding have a reciprocal relationship; one may have led to the other. In this retrospective study there was no way to determine if positive breastfeeding attitudes preceded breastfeeding.

Other studies have identified exposure to breastfeeding (operationalized in this study as number of types of childhood breastfeeding observations) as influential in

breastfeeding initiation (Meyerink & Marquis, 2002); but exposure to breastfeeding was not a predictor for breastfeeding initiation in the current study. The usual demographic variables of age, education, and income were not significant predictors for having breastfed an infant for the FSA or Student groups. Scott et al. (2006) and Merten and Ackerman-Liebrich (2004) also found that demographic variables did not predict breastfeeding initiation. The finding was attributed to the fact that rising levels of breastfeeding initiation made social inequalities less apparent. The higher breastfeeding rate in the current study sample could contribute to lack of such finding as well.

For Student respondents, Breastfeeding Attitude was predicted by the number of types of childhood observations of breastfeeding, age, and gender. An “exposure to breastfeeding” variable is sometimes reported in the literature and most closely represents the variable in this study, “number of types of childhood breastfeeding observations”. Swanson et al. (2006) reported that age and exposure to breastfeeding predicted Breastfeeding Beliefs (which contained similar content to Breastfeeding Attitude in current study) in an adolescent population, and concurs with the current study findings.

Also for Student respondents, Breastfeeding Appropriateness in Various Settings had several predictors other than Breastfeeding Attitude and Breastfeeding Beliefs. Age, education, and number of types of childhood breastfeeding observations were also predictors. Breastfeeding Appropriateness in Various Settings is a variable that is not commonly found in breastfeeding studies

In the regression models, the FSA group had one to two significant predictors, whereas the Student group had three to five significant predictors, indicating that

differences of age, education, and income (significant predictors of the Student group) are less discriminating as age, education, and income increase.

Limitations

Convenience sampling, because of the risk of bias, is usually identified as a limitation to any study that uses that method to obtain participants. In this study, the convenience sampling method did produce a biased sample, a sample that breastfed at a rate higher than the general population. It appears that people who had more interest and/or experience with breastfeeding participated in the survey. The unexpected negative findings related to observations of public breastfeeding were illuminating though, because they did come from a generally breastfeeding supportive group. Sometimes information may be even more meaningful when negative findings are evident from a group that was assumed to have had positive findings. One limitation of the study was the large number of items per scale and the total length of the survey. Other limitations were the small number of men and the high education and income levels of the respondents. Information absent from the survey, such as breastfeeding intention, breastfeeding duration, and breastfeeding exclusivity could have provided important variables to analyze.

Summary

The strength of the study was that it was one of few studies that survey a community population on a wide variety of breastfeeding questions. A national randomized study, HealthStyles (Li et al., 2007), asks limited breastfeeding questions. The large number of variables and the large number of respondents in the current study allowed for varied analyses. The current research provided a unique opportunity to study

a community group on numerous variables designed to survey breastfeeding attitudes, beliefs, experiences, and exposure. Community reactions to public breastfeeding are one identified barrier to breastfeeding. The literature has identified that barrier as not unique to any one group. Gill et al (2004) observed that the breastfeeding barriers identified by her study sample of low income Mexican-Americans were the same as those that had been demonstrated by other researchers across varied populations; consequently the findings of this study can be instructive across different subsamples of persons. The sample of respondents in the current study did have high rates of breastfeeding and had positive breastfeeding attitudes and beliefs, yet public breastfeeding came through as an issue. The disjuncture among those that are supportive of breastfeeding and still feel public breastfeeding is inappropriate will continue to affect community breastfeeding behaviors. If those that breastfeed perceive negative feelings when out in the community, breastfeeding patterns may be altered, which could result in shorter duration and less exclusivity. Identifying barriers to breastfeeding among a group that is breastfeeding friendly is a way to identify variables that can be addressed in planned interventions for all persons. Further research to understand underlying reasons for perceiving public breastfeeding as inappropriate would be important before developing planned interventions to address the issue.

The current study also identified exposure to breastfeeding at a younger age as important in improving breastfeeding attitudes and to improving feelings about observing breastfeeding in various settings. Breastfeeding attitudes continue to be a major factor in mediating breastfeeding behavior such as choosing to breastfeed.

APPENDIX

SURVEY INSTRUMENT

Infant Feeding Questions

Background Information:

Please mark the box next to the response that best describes you.

1. Your Gender ☐ female
☐ male
2. Your Age ☐ years
3. Your Marital Status ☐ single, never married
☐ married
☐ divorced
☐ widowed
☐ cohabitating
4. Do you have children? ☐ no
☐ yes
ages: _____
(Scroll Down Box)
5. Highest earned degree ☐ grade school
☐ high school
☐ bachelor's degree
☐ master's degree
☐ doctoral degree
☐ other (please specify)
6. Estimated annual family income ☐ <\$5,000
☐ \$5,000-9,999
☐ \$10,000-19,999
☐ \$20,000-29,999
☐ \$30,000-39,999
☐ \$40,000-49,999
☐ \$50,000-59,999
☐ \$60,000-69,999
☐ \$70,000-79,999
☐ \$80,000 and up

7. NDSU status

_____ faculty
_____ administration
_____ staff
_____ student:
_____ freshman _____
_____ sophomore _____
_____ junior _____
_____ senior _____
_____ graduate _____

8. NDSU department or major

_____ (Scroll Down Box)

Mark the box on each scale that most closely represents how you feel.

To me the idea of a woman breastfeeding for 6 months or more is:

1. Unpleasant	___	___	___	___	___	___	Pleasant
2. Embarrassing	___	___	___	___	___	___	Not Embarrassing
3. Healthy	___	___	___	___	___	___	Unhealthy
4. Repulsive	___	___	___	___	___	___	Attractive
5. Convenient	___	___	___	___	___	___	Inconvenient
6. Unnatural	___	___	___	___	___	___	Natural

To me the act of a woman breastfeeding for 6 months or more is:

1. Unpleasant	___	___	___	___	___	___	Pleasant
2. Embarrassing	___	___	___	___	___	___	Not Embarrassing
3. Healthy	___	___	___	___	___	___	Unhealthy
4. Repulsive	___	___	___	___	___	___	Attractive
5. Convenient	___	___	___	___	___	___	Inconvenient
6. Unnatural	___	___	___	___	___	___	Natural

To me the idea of a woman bottle-feeding for 6 months or more is:

1. Unpleasant	___	___	___	___	___	___	Pleasant
2. Embarrassing	___	___	___	___	___	___	Not Embarrassing
3. Healthy	___	___	___	___	___	___	Unhealthy
4. Repulsive	___	___	___	___	___	___	Attractive
5. Convenient	___	___	___	___	___	___	Inconvenient
6. Unnatural	___	___	___	___	___	___	Natural

To me the act of a woman bottle-feeding for 6 months or more is:

1. Unpleasant	___	___	___	___	___	___	___	Pleasant
2. Embarrassing	___	___	___	___	___	___	___	Not Embarrassing
3. Healthy	___	___	___	___	___	___	___	Unhealthy
4. Repulsive	___	___	___	___	___	___	___	Attractive
5. Convenient	___	___	___	___	___	___	___	Inconvenient
6. Unnatural	___	___	___	___	___	___	___	Natural

Below please indicate you personal beliefs about possible results that might occur if someone breastfeeds or formula feeds an infant 6 months or more. Place your response to each item somewhere on the scale from unlikely to likely.

If a woman **BREASTFEEDS** for the first 6 months or more:

1. The baby will experience <u>few</u> illness, during the first year.	Unlikely	___	___	___	___	___	___	Likely
2. Any illness the baby experiences, during the first year, will be <u>mild</u> .	Unlikely	___	___	___	___	___	___	Likely
3. The baby will have <u>no</u> allergies, or mild allergies.	Unlikely	___	___	___	___	___	___	Likely
4. The baby will have good jaw and facial development.	Unlikely	___	___	___	___	___	___	Likely
5. The baby will <u>not</u> be overweight in relation to height.	Unlikely	___	___	___	___	___	___	Likely
6. The baby will <u>not</u> be underweight in relation to height.	Unlikely	___	___	___	___	___	___	Likely
7. The baby will <u>not</u> become obese later in life.	Unlikely	___	___	___	___	___	___	Likely
8. The baby will associate the smell of milk and feel of mother's skin with feelings of safety, warmth, and satisfaction of hunger.	Unlikely	___	___	___	___	___	___	Likely
9. The mother and baby will experience a lot of skin-to-skin contact.	Unlikely	___	___	___	___	___	___	Likely
10. Feedings will be a rewarding time.	Unlikely	___	___	___	___	___	___	Likely

24. The baby will not be underweight in relation to height.
Unlikely _____ Likely
25. The baby will not become obese later in life.
Unlikely _____ Likely
26. The baby will associate the smell of milk and feel of mother's skin with feelings of safety, warmth, and satisfaction of hunger.
Unlikely _____ Likely
27. The mother and baby will experience a lot of skin-to-skin contact.
Unlikely _____ Likely
28. Feedings will be a rewarding time.
Unlikely _____ Likely
29. The mother will feel close to her baby 12 months after delivery.
Unlikely _____ Likely
30. The mother will feel satisfaction with the mothering role.
Unlikely _____ Likely
31. The mother will feel satisfied that the baby is getting the best type of milk for his/her teeth.
Unlikely _____ Likely
32. The mother will return to her pre-pregnant or ideal weight, within the year following delivery.
Unlikely _____ Likely
33. The mother will save time by formula feeding.
Unlikely _____ Likely
34. The mother will save money by formula feeding.
Unlikely _____ Likely
35. Formula feeding will be convenient.
Unlikely _____ Likely
36. The mother's interest in sex will return rapidly.
Unlikely _____ Likely

Infant Feeding Experiences

Were you breastfed as an infant? _____ no
 _____ yes
 _____ don't know

If you have a partner, was he/she breastfed as an infant? _____ no
 _____ yes
 _____ don't know

Were you sisters or brothers breastfed as infants? _____ no
 _____ yes
 _____ don't know
 _____ no siblings

Did you ever observe a woman breastfeeding when you were a child? _____ no
 _____ yes
 _____ don't know

If so, who? (Check all that apply) _____ mother
 _____ other relative
 _____ stranger
 _____ family friend
 _____ other (please specify)

Were any of your own children breastfed? _____ no
 _____ yes
 _____ I do not have children

If you have children who were breastfed, use the scale below to indicate your overall level of dissatisfaction/satisfaction with the experience.

Negative _____ Positive
 (Extremely Dissatisfying) (Extremely Satisfying)

Please mark the box next to places where you have observed women breastfeeding their infants, and indicate how you felt about the appropriateness/pleasantness of the observation.

<u>Place</u>	<u>Your Reaction</u>		
_____ infant's home	inappropriate _____	neutral _____	natural _____
_____ relative's home	inappropriate _____	neutral _____	natural _____

_____ school	inappropriate_____	neutral_____	natural_____
_____ church	inappropriate_____	neutral_____	natural_____
_____ shopping mall/store	inappropriate_____	neutral_____	natural_____
_____ restaurant	inappropriate_____	neutral_____	natural_____
_____ park	inappropriate_____	neutral_____	natural_____
_____ car	inappropriate_____	neutral_____	natural_____
_____ hospital	inappropriate_____	neutral_____	natural_____

Students and employees are often challenged by the need to coordinate family roles and responsibilities with school/work roles and responsibilities. Please mark the boxes that demonstrate your interest/support for development of services for childbearing families at NDSU.

- _____ infant day care
- _____ lactation lounge with facilities for breastfeeding mothers to pump and store breast milk
- _____ new family support groups
- _____ new family information networks
- _____ other: _____

Please use the rest of the space for any additional comments you may have.

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