

AN EVALUATION OF THE WOMEN INFANTS AND CHILDREN (WIC)  
BREAST PUMP DISTRIBUTION PROGRAM: A CURRENT ASSESSMENT  
AND FUTURE DIRECTIONS

by

Alexis J. Tuma

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Research Advisor

The Graduate School

University of Wisconsin-Stout

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The Graduate College  
University of Wisconsin-Stout  
Menomonie, WI 54751

**ABSTRACT**

          Tuma  Alexis  J.  
(Writer) (Last Name)  (First Name)  (Middle Initial)

An Evaluation of the WIC Breast Pump Distribution Program: Current  
Assessment and Future Directions  
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Food and Nutritional Sciences Dr. Lydia Chowa DrPh. 02/04  103  
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Breastfeeding an infant is one of the most important contributors to infant health. It ensures both long and short-term benefits for the infant, mother, family and society. Even though there are many benefits to breastfeeding, the current rates of breastfeeding initiation and continuation are not meeting public health goals.

The WIC Program in a Wisconsin county is trying to help to increase the breastfeeding initiation and continuation rates in this county with a new program called The WIC Breast Pump Distribution Program. This program allows the

WIC Program to lend breast pumps to eligible WIC participants in hopes of increasing breastfeeding initiation and duration rates.

The purpose of this study is to evaluate The WIC Breast Pump Distribution Program in a Wisconsin county WIC Program based on breastfeeding initiation and duration rates. The county is referred to as County A throughout the study to keep the name of the county and the WIC participants that took part in the study confidential. A summative evaluation was used to evaluate the program. This evaluation was based on the logic model.

A self-reported questionnaire was developed and used to collect demographic and descriptive data from the participants. This questionnaire also contained questions about infant feeding practices and requested information about the participant's attitudes toward breastfeeding and using a breast pump.

Twenty-seven women enrolled in the WIC Program agreed to participate in the study. The ages of the participants ranged from 18 to more than 35 years of age. Three of the participants breastfed infants, but did not use a breast pump. Twenty-four of the participants used a breast pump and participated in The WIC Breast Pump Distribution Program. Most of the women in this study were Caucasian and were also married. Approximately forty-one percent of the participants were unemployed. All of the participants that did not use a breast pump were unemployed while breastfeeding their infant.

The majority of the participants responded positively toward breastfeeding, breast pumps, and The WIC Breast Pump Distribution Program, however, participants that used a single manual pump had a more negative attitude toward breastfeeding and The WIC Breast Pump Distribution Program than those participants that used a double electric pump. Many of the women stated that the breast pump helped them to breastfeed their infants longer than they would have been able to without the use of a breast pump. The most common reasons for requesting a pump included returning to work or school and not having enough milk to meet the infant's needs.

Overall, the results of this study indicate that The Breast Pump Distribution Program has helped to increase breastfeeding initiation rates and the duration of breastfeeding among women that participated in this program. Some recommendations for enhancing the program include an increase in the advertising of the program, encouraging all WIC participants to meet breastfeeding goals, showing all women in the program how to use the pump and clean the pump before taking it home, and referring all eligible WIC participants to Medical Assistance to receive a pump. These recommendations would help to increase the use of the program, make the program user-friendlier, and help to increase the breastfeeding initiation and duration rates of WIC Program participants.

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## **List of Abbreviations**

AAP: American Academy of Pediatrics

BMI: Body Mass Index

DHHS: Department of Health and Human Services

DHA: Docosahexaenoic acid

IQ: Intelligence Quotient

LLL: La Leche League International

NSA: Nutrition Services and Administration

PedNSS: Nutrition Surveillance System

SPSS: Statistical Package for the Social Sciences

USDA: United States Department of Agriculture

WIC: Supplemental Nutrition Program for Women, Infants and Children

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## **Chapter 1**

### **Introduction**

#### **A. Statement of the Problem**

Breastfeeding an infant is one of the most important contributors to infant health. It ensures both long-term and short-term benefits for the mother, infant, family, and society. Breastfeeding provides many benefits for the infant such as resistance to infectious diseases, enhanced immune system, nutritional and growth benefits, reduced risk for chronic diseases, and developmental benefits. Breastfeeding also improves maternal health and provides socioeconomic benefits to the family and to society (Department of Health and Human Services, 2002).

“Despite the many benefits of breastfeeding, the rates of breastfeeding initiation and continuation fall far short of national public health goals” (Meyers, 2001, p. 931). In the past, the American Academy of Pediatrics recommended that mothers nurse for at least six months, but today it is recommended that mothers nurse for at least one year. Exclusive breastfeeding should be practiced for the first six months after birth. Exclusive breastfeeding means that maternal milk is the only food source for the infant. No other liquids or foods are given to the infant. The American Academy of Pediatrics recommends that after six

months, complementary foods should be introduced while still breastfeeding the infant. (American Academy of Pediatrics Work Group on Breastfeeding, 1997).

*Healthy People 2010*, the United States' health plan for the next decade, sets the goal to increase the proportion of mothers who breastfeed their babies in the United States. The target for 2010 is that at least 75 percent of mothers will breastfeed their infants in the early postpartum period; however, in 1998, 64 percent of mothers in early postpartum period breastfed their infants. At six months postpartum, only 29 percent of mothers breastfed their infants in 1998. *Healthy People 2010* aim for this percentage to increase to at least 50 percent of mothers who breastfeed their infant at six months postpartum. In 1998, 16 percent of mothers breastfed their babies at one year postpartum. The target for 2010 is for at least 25 percent of mothers will breastfeed their infant until at least one year of age. (U.S. Department of Health and Human Services, 1998)

The Women, Infants and Children Program, also referred to as the WIC Program, is a federally funded program that promotes healthy infant and child feeding practices by providing nutrition education. The mission of the WIC Program is to promote and maintain the health and well being of nutritionally at risk pregnant, breastfeeding and postpartum women, infants and children.

The WIC Program has a strong commitment to promote breastfeeding. The WIC Program serves high risk, low-income women whose breastfeeding

rates have historically been less than the general population. All pregnant women in the WIC Program are educated about breastfeeding as the best way to feed their baby and are encouraged to choose breastfeeding. Women who breastfeed are provided with counseling and support by the WIC staff to ensure their success. WIC also provides additional foods to women who choose to breastfeed exclusively. A main goal of the WIC Program is to increase the number of women participating in the WIC Program that breastfeed their infants. Supplying breast pumps to WIC participants may help to raise this number.

In July of 1999, the USDA released new regulations allowing states to use WIC food dollars to purchase breast pumps. Previously, only nutrition services and administration (NSA) funds could be used to purchase or rent breast pumps. Due to these new regulations, in September 2000, the Wisconsin WIC Program began purchasing and distributing breast pumps to local WIC projects. The program that distributes breast pumps to mothers participating in WIC is now being referred to as The WIC Breast Pump Distribution Program.

The WIC Breast Pump Distribution Program supplies breast pumps to mothers participating in the WIC Program based on need. Most women, in normal circumstances, can establish and maintain lactation without the use of a breast pump; however, breast pumps can be effective tools in assisting some mothers to breastfeed. Breast pumps can be provided to mothers of premature

infants, mothers of infants with severe feeding problems, mothers who are having difficulty establishing or maintaining adequate milk supply due to maternal/infant illness and mothers who have temporary breastfeeding problems, such as engorgement. Breast pumps can also be provided during mother/infant separation such as hospitalization or return to work or school and to mothers of multiples. Providing breast pumps and supportive education to WIC participants who meet the assessment criteria, all with the goal of maintaining comfort, establishing lactation, and/or maintaining lactation, may result in increased breastfeeding initiation rates and a longer duration of breastfeeding for many women and infants.

Wisconsin Medicaid provides reimbursement for breast pumps when the clinical guidelines are documented. Due to limited funds, the WIC Program is not able to supply breast pumps to all mothers who need a pump. If a WIC Program participant receives Medicaid, every reasonable effort should be made to obtain a breast pump through Medicaid prior to providing a breast pump purchased with WIC funds.

### **B. Purpose of the Study**

The promotion and support of breastfeeding are important components to a successful breastfeeding experience. Therefore, to better facilitate breastfeeding in County A Wisconsin the WIC Program has implemented a new program, The



WIC Breast Pump Distribution Program. This program enables the WIC Program to offer breast pumps to eligible WIC participants. The ultimate goal of The WIC Breast Pump Distribution Program is to support initiation and a longer duration of breastfeeding among mothers involved in the program. In order to determine funding for the program, participant needs such as training or procedure changes, and coordination with Medicaid this program needs to be evaluated. The purpose of this study was to evaluate The WIC Breast Pump Distribution Program used in the County A WIC Program based on breastfeeding initiation and duration rates. This was a summative evaluation based on the logic model. This method was chosen because it focuses on the outcomes of The WIC Breast Pump Distribution Program.

This study may increase the use of The WIC Breast Pump Distribution Program and thus the number of women that breastfeed their infants. Breastfeeding has been shown to improve the overall health of infants and to decrease the amount of money spent on health care. The money that is not spent on health care can then be spent on other important developmental programs that will benefit infants and children. Healthier babies mean healthier communities which in turn means a healthier society and an overall healthier nation.

There is very little published research about the effectiveness of breast pumps on the initiation and duration of breastfeeding. Also there is almost no

data on the evaluation of this new program, The WIC Breast Pump Distribution Program. The data that is collected in this study will contribute to the current published information about breastfeeding.

### **C. Assumptions of the Study**

1. All women in this study participated in the WIC Program located in County A.
2. All participants in the study fed their infant breast milk by breastfeeding the infant and/or using a breast pump.
3. All participants in the study were assumed to be truthful when answering questions on the questionnaire.
4. The WIC staff distributing the questionnaires diligently followed questionnaire distribution procedures.

### **D. Delimitations of the Study**

This study is intended to evaluate The Breast Pump Distribution Program used by the WIC Program in County A. This study does not evaluate any similar programs in other counties. This study involves participants in the County A WIC Program that participated in The WIC Breast Pump Distribution Program. It also involves women participating in the County A WIC Program that breastfed their infant, but did not use a breast pump. The purpose of this study is not to modify the thinking, attitudes, feelings, or any other aspect of the participants'

behavior. The purpose is to evaluate The WIC Breast Pump Distribution Program based on breastfeeding initiation and duration rates.

### **E. Limitations**

A major limitation in this study was the dependence on distribution of the questionnaires by WIC staff members to WIC participants. The researcher had no contact with the participants. In this study, the questionnaire was handed out to WIC participants only during their visit to the WIC clinic. The WIC staff has a very busy schedule and many times did not hand out the questionnaires to the clients. Another limitation of this study is the use of a small sample size ( $n = 27$ ), due to time constraints, which may have an effect on the results. One other limitation is the fact that the questionnaire was only available in an English version, due to lack of a translator, which may exclude a portion of the sample population.

### **F. Objectives of the Study:**

1. To evaluate the effect of providing breast pumps to WIC participants on initiation and duration rates through the use of a questionnaire.
2. To determine the frequency of use of the breast pumps among mothers participating in the WIC Program through the use of a questionnaire.

## **G. Organization of the Report**

This report is organized into five chapters. Chapter one contains an explanation of the problem. This chapter explains why The Breast Pump Distribution Program needs to be evaluated. Chapter two contains a literature review on breastfeeding and breast pumps and chapter three includes details of the research methods used in the study. Chapter four presents the results of the study including demographic and descriptive data on the participants. Chapter five includes a discussion about the study and conclusions as well as recommendations for future studies related to breastfeeding and breast pumps. Chapter five is followed by a list of references and appendices.

## **Chapter 2**

### **Review of Literature**

#### **A. Introduction**

This chapter will begin by discussing the breastfeeding initiation and duration rates in the United States, Wisconsin, and County A. Breastfeeding rates at the WIC Program in County A will also be discussed. The benefits of breastfeeding to the infant, the mother, the family and to society will then be discussed. This will be followed by a discussion of the barriers to breastfeeding.

#### **B. Breastfeeding Initiation and Duration Rates in the United States**

According to the American Academy of Pediatrics, human milk is considered to be the best source of nutrition for the human infant. However, regardless of the numerous advantages of breastfeeding, many mothers choose not to initiate breastfeeding or continue to breastfeed for the recommended one year postpartum for various reasons (American Academy Pediatrics, 1997).

At the beginning of the 20<sup>th</sup> century, practically all mothers started breastfeeding their infants in the hospital after giving birth. As the use of cow's-milk based formulas increased, the number of mothers that breastfed their infants decreased. This number decreased even further with the introduction of commercially prepared human milk substitutes in the 1920's. By the late 1960s,

fewer than 25% of women in the United States initiated breastfeeding after giving birth. Because of this low number of women initiating breastfeeding, public health officials, health professionals, and others concerned about the health of mothers and infants implemented strategies to promote breastfeeding in the United States (Write, 2001). Breastfeeding rates increased over the next few years, reaching a high of 61.9% in 1982. This percentage then decreased again in the mid-1980s (ADA, 2001).

In 1989 the United States Public Health Service released *Healthy People 2000*, which included goals such as increasing the breastfeeding initiation rate to 75%. *Healthy People 2000* also aimed to increase breastfeeding initiation rates among high-risk groups. Some of the high-risk groups were reported as having breastfeeding rates as low as 25%. *Healthy People 2000* also recommended increasing the length of time that mothers breastfeed their infants from six months to at least one year. These goals were restated in *Healthy People 2010*. However, the most recent data indicate that the United States has not met this goal. (Write, 2001)

In 1998, only 67% of mothers in the United States initiated breastfeeding after giving birth, and only 26% continued to breastfeed their infant at six months of age. Among WIC participants throughout the United States, only 55.5% began breastfeeding in the hospital after giving birth, and only 11.2% were breastfeeding

at six months postpartum. (United States Department of Health and Human Services, 1998.)

### **C. Breastfeeding Initiation and Duration Rates in Wisconsin**

Breastfeeding initiation and duration rates in Wisconsin are lower than the national rates. In 1998, figures from the Pediatric Nutrition Surveillance System (PedNSS) show that 49% of mothers in Wisconsin initiate breastfeeding and 29% of mothers are still breastfeeding at three months postpartum. However, only 21% of mothers in Wisconsin continued to breastfeed their infants at six months postpartum (Wisconsin Breastfeeding Coalition, 2002).

The Pediatric Nutrition Surveillance System is designed as a program-based surveillance system and is intended to provide a framework for tabulating and interpreting state-specific information on the nutritional characteristics of low-income children. The Pediatric Nutrition Surveillance System includes mothers and infants who participate in the Women, Infant and Children (WIC) Program (National Center for Chronic Disease Prevention and Health Promotion, 2002).

### **D. Breastfeeding Initiation and Duration Rates in the County A WIC Program**

Breastfeeding rates for 2001 in the County A WIC Program are similar to the breastfeeding rates in the state of Wisconsin, but are somewhat lower than

national breastfeeding rates. In this county's WIC Program, 51% of mothers are breastfeeding at birth. This number is reduced to 42% of mothers still breastfeeding at 1 month postpartum. At six months postpartum, only 21% of mothers are still breastfeeding their infants. In the County A WIC Program only eight percent of mothers are still breastfeeding at one year postpartum.

#### **E. Benefits of Breast Milk for the Infant**

The American Academy of Pediatrics (AAP) states that breast milk is the optimal form of nutrition for infants. Research has shown that infants fed breast milk have a decreased risk for a number of acute and chronic diseases. Breastfed infants experience fewer cases of infectious diseases in addition to a decreased incidence and severity of diarrhea, respiratory infections, and ear infections. These infants have been shown to have a decreased risk of sudden infant death syndrome, also known as SIDS (Hauck, 2003). Research also indicates that breast milk provides advantages in regard to growth, development, and overall health of the infant. Based on this evidence, the American Academy of Pediatrics has documented that, "The breastfed infant is the reference model against which all alternative feeding methods must be measured with regard to growth, health, development, and all other short and long-term outcomes" (American Academy Pediatrics, 1997).



## **1. Resistance to Infectious Diseases**

Human milk contains many factors that are active against infection. Specifically, human milk contains immunoglobins, phagocytes, T lymphocytes, enzymes such as lysozymes, and other factors that act against viruses, bacteria, and parasites. These substances are transferred from the breast milk to the infant and help protect the infant against infectious diseases. This is beneficial for the breastfed infant because an infant's immune system is not fully developed until approximately two years of age. Transferring these substances from the breast milk to the infant will help to enhance the infant's immune system and fight disease. Infants that are not breastfed do not experience this benefit (Latham, 1999).

## **2. Enhanced Immune System**

Breastfed infants, compared to formula fed infants, produce enhanced immune responses to polio, tetanus, diphtheria, and to respiratory syncytial virus infection, a common infant respiratory infection (United States Department of Health and Human Services, 2003). Research shows that this may be due to the components of breast milk that enhance an infant's immune system. Breast milk contains inflammatory and anti-inflammatory factors that regulate the response of the immune system against infection. Such factors consist of macrophages and CD8-positive T lymphocytes, which are present in high concentrations in

colostrum and at lower concentrations in breast milk. Lactoferrin and anti-secretory factor are other substances found in breast milk that contribute to enhancing an infant's immune system. Lactoferrin suppresses cytokine release from macrophages. Anti-secretory factor enhances an infant's immune system by inhibiting fluid and electrolyte secretion and inflammation in the intestine. This helps to prevent diarrhea. Antibodies in the form of immunoglobins, may help to protect the gastrointestinal tract. Complex oligosaccharides, which are not found in cow's milk, help to enhance the immune system by functioning as ligands for leukocyte adhesion molecules. Another factor found in breast milk, epidermal growth factor, may enhance the maturation of the gut. There is also evidence that breastfeeding results in earlier development of the infant immune system. All of these factors in breast milk protect the breastfed infant from harmful parasites, viruses, and bacteria (Wold, 1998).

Research has shown that protection against infection is strongest during the first months of life for infants who are breastfed exclusively. Several studies suggest that the benefits of breastfeeding continue after breastfeeding is terminated. Longer durations of breastfeeding may provide a stronger protective effect against infection. Overall research has found that children who were breastfed for any amount of time have fewer illnesses than those who were never breastfed; however, infants who are breastfed exclusively for the first months of

life experience the most benefits (United States Department of Health and Human Services, 2003).

### **3. Nutritional Growth Benefits**

Human milk is the ideal source of nutrition for infants because it contains an appropriate balance of nutrients that is specifically designed to meet the infants' needs. Breast milk contains appropriate amounts of carbohydrate, protein, and fat. It also provides digestive enzymes, minerals, vitamins, and hormones that all infants require. Breast milk contains valuable antibodies from the mother that can help the baby resist infections.

Breast milk provides nutrients in easily digestible and bioavailable forms. It is low in total protein and low in casein making it much less stressful than cow's milk on the infant's immature kidneys. The main form of protein in human milk is whey, which is easily digested by the infant. The lipids and enzymes in human milk promote efficient digestion and utilization of nutrients. Human milk also contains essential fatty acids, saturated fatty acids, medium chain triglycerides, and cholesterol that are present in the amounts that an infant needs. In addition, breast milk provides the infant with minerals such as iron, zinc, and calcium that meet an infant's needs (American Dietetic Association, 2002).

Breastfeeding may help to prevent overweight and childhood obesity later in life. Scientific evidence suggests that breastfed infants are leaner at one year of

age than formula-fed infants at the same age. This early growth pattern may influence later growth patterns, resulting in a lower incidence of overweight and obesity among children who were breastfed (Vastag, 2003).

#### **4. Reduced Risk for Chronic Diseases**

Many studies have found that breastfeeding an infant may reduce the risk of an infant developing chronic diseases during childhood. Lower rates of several chronic diseases were found among children who were breastfed as infants.

Breastfeeding may reduce the risk of type 1 and 2 diabetes, celiac disease, inflammatory bowel disease, cancer, and asthma, and allergies during childhood.

Further research is needed in this area due to mixed results in several studies (United States Department of Health and Human Services, 2002).

#### **5. Developmental Benefits**

Several studies have observed the relationship between breastfeeding and development. The majority of the studies found that brain growth and development was more advanced among individuals that were breastfed as infants rather than formula fed. These studies found that breastfed infants had a higher IQ than nonbreastfed infants. This may be due to more advanced development and growth of the brain of the breastfed infant. Human milk contains substances that are essential for optimal brain growth and development (Vestergaard, 1999).

Long-chain polyunsaturated fatty acids available in breast milk are important for

both brain growth and development. The long-chain polyunsaturated fatty acid Docosahexaenoic acid (DHA) is present in breast milk, but is not found in standard infant formulas. Some studies have shown that infants fed formula supplemented with DHA had more advanced brain development than infants fed standard infant formula. Breast milk contains hormones, oligosaccharides, and other trophic factors that may influence brain development (Vestergaard, 1999). Further research is needed due to mixed results in some studies.

## **F. Benefits of Breastfeeding for the Mother**

Infants are not the only individuals that experience the benefits of breastfeeding. Mothers that breastfeed their infants also experience benefits. Mothers that breastfeed their infants have less postpartum bleeding and return to their pre-pregnancy weight sooner than mothers that do not breastfeed their infants. Breastfeeding mothers also have a decreased risk of ovarian cancer and premenopausal breast cancer.

### **1. Improved Maternal Health**

Breastfeeding has many benefits regarding a mother's health such as hormonal, physical, and psychosocial benefits for the mother. Breastfeeding increases levels of oxytocin, which is a hormone that stimulates uterine contractions. This helps to minimize postpartum bleeding and induce a more rapid uterine involution. Exclusive breastfeeding may help a woman from

becoming pregnant soon after the infant is born. Breastfeeding delays the resumption of normal ovarian cycles and the return of fertility in most women, which may help to increase child spacing; however, this method of birth control is not very reliable. Mothers that breastfeed their infants are likely to experience psychological benefits such as increased self-confidence and increased bonding with their infants (Bilyk, 1996).

Studies have shown that breastfeeding for longer periods of time may reduce the risk of premenopausal and postmenopausal breast cancer. In addition, the risk of ovarian cancer may be lower among women that breastfed an infant. Research has also shown that mothers that breastfeed their infants have a decreased risk of developing osteoporosis later in life (Jones, 2002).

## **G. Benefits of Breastfeeding to Society**

Feeding infants breast milk is cost-beneficial to individual families, employers, communities, and the nation. Reduced health care and infant feeding costs and reduced employee absenteeism are just a few of the ways breastfeeding can save money.

### **1. Socioeconomic Benefits**

Breastfeeding provides economic and social benefits to the family, the health care system, the employer, the community, and the nation. Families can save hundreds of dollars over the cost of feeding infant formula. Even after

accounting for the costs of breast pump equipment and additional food required by the nursing mother, breastfeeding an infant is still much less expensive than formula feeding. Fewer sick care visits, prescriptions, and hospitalizations have been observed among breastfed infants. Therefore, total medical care expenditures are lower for breastfed infants than for infants that are not breastfed (Department of Health and Human Services, 2003).

Employers also benefit when their employees breastfeed. Illness among breastfed infants is significantly lower than among nonbreastfed infants; therefore, there is a decrease in parental absenteeism from work and a reduced loss of income for the family. In addition, employer medical costs are lower and employee productivity is higher when an employee breastfeeds her infant (American Academy of Pediatrics, 1997).

#### **H. Barriers to Breastfeeding**

There are a number of factors that affect a woman's decision to breastfeed. Demographic factors such as age or income help to determine if a woman is likely to breastfeed her infant. Other factors include if and when a woman returns to work, lack of information, and a lack of support from friends, family, and health professionals. Introduction to infant formula and early introduction to solid food also contribute to short durations of breastfeeding. Not addressing breastfeeding

problems early in the neonatal period and the marketing of infant formula are barriers to the initiation and duration of breastfeeding.

### **1. Demographic Factors Associated with the Duration Breastfeeding**

Research has shown that demographic factors such as low income, being younger than 20 years of age, living in the south-central United States, and not being of the Caucasian race are barriers to the longer duration of breastfeeding. Research has also shown education to be a factor in how long a woman breastfeeds her infant. The more education a woman has, the more likely she is to breastfeed her infant for a longer period of time. Marital status is another factor in determining whether a woman will breastfeed her infant. An unmarried woman is less likely to breastfeed than a married woman. Women enrolled in the Women, Infants and Children (WIC) Program have been shown to breastfeed their infants for a shorter period of time than mothers in the general population. Caucasian women in the Western United States have the longest breastfeeding duration rates in the United States (Shelton, 1997).

### **2. Going Back to Work/School**

In the United States, approximately 70% of employed mothers who have children less than three years of age work full-time. About one-third of these mothers return to work within three months after giving birth and about two-thirds return to work within six months after giving birth (United States Department of



Health and Human Services, 2002). Research by Nobel indicates that women planning to work full-time are significantly less likely to initiate breastfeeding or continue to breastfeed the infant for the recommended one year. Many women believe that it is not possible to breastfeed an infant and work full-time. In addition, Nobel reported that the younger the infant is when the mother returns to work the less likely she is to continue breastfeeding the infant (Nobel, 2001).

Generally, women returning to work after childbirth will have a shorter duration of breastfeeding than those who do not return to work after giving birth. Spatial separation of the mother and the infant, inadequate facilities in the workplace and inflexible hours all contribute to the reduced duration of breastfeeding by working mothers (Nobel, 2001). Negative attitudes by employers and coworkers can be a barrier to the continuation of breastfeeding (Jones, 2002). If the working conditions of nursing mothers supported breastfeeding, women returning to work soon after giving birth may be more likely to initiate and continue to breastfeed their infant.

### **3. Lack of Information**

Another barrier to breastfeeding is the lack of information about breastfeeding and its importance. Much of the information about breastfeeding in books, magazines, the media, and on the Internet seems to lack accuracy and

consistency. A lot of the information about breastfeeding in older literature is outdated and incorrect.

New parents lack information and knowledge about breastfeeding due to insufficient prenatal education. Not all health professionals provide expectant parents with adequate breastfeeding information. This may be due to misinformation, lack of knowledge or training, or his/her own biases and experiences with breastfeeding. The information that is provided to new parents may be inconsistent. This may confuse the new parents. Thus they may then be more likely to give infant formula to their baby.

It is critical that health care professionals be knowledgeable about breastfeeding because many people rely on the information they provide about breastfeeding. Health professionals advocating breastfeeding are increasing in number, but the education and skills that each has varies greatly. Due to this fact, the quality of information that they provide likewise varies. Some health care professionals may be inadequately trained to recognize problems and offer interventions that support breastfeeding, which may decrease the duration of breastfeeding for some mothers (American Dietetics Association, 2001).

Another reason for the lack of information is that many physicians do not discuss the infant feeding decision in detail with expectant parents. There are many formula-company sponsored educational materials about breastfeeding in a

number of doctors' offices. This may encourage new parents to give infant formula to their newborn. Also it is still common for a physician to suggest giving infant formula if problems with breastfeeding occur (Simmons, 2002).

#### **4. Lack of Support**

Women that choose to breastfeed are more likely to have received general support during pregnancy from their friends or relatives. They are also more likely to receive help in their infant feeding decision from all sources, including their mother, the baby's father, their friends, health care professionals, Lamaze classes, school, books, media, or support groups such as La Leche League.

The failure of women to initiate or to continue to breastfeed may be attributed to a lack of social support. Many women choose not to breastfeed because of a lack of support from those they rely on such as their mother, husband, friends, or a significant other. Support can be provided by support groups such as La Leche League International (LLL). This is a volunteer mother-to-mother support group that supports breastfeeding mothers. The WIC Program also supports and strongly encourages breastfeeding by educating WIC participants about breastfeeding. Both of these programs are very helpful in supporting women wishing to breastfeed; however, the need for programs such as these far outweighs the supply (Dermer, 2003).

Under normal circumstances, mothers stay in the hospital only a few days after giving birth. For this reason, it may be difficult for them to receive support from their health care providers. Short postpartum hospital stays limit the time for the needed support and breastfeeding education that health care professionals are able to provide to the new mother.

### **5. Early Introduction to Solid Foods**

When solid foods are introduced, breast milk is replaced. Studies have shown that early introduction of these foods neither enhances growth nor the nutritional status of infants. Since breastfed infants self-regulate their intakes to meet their energy needs, there may be no advantage to introducing other foods before six months. Most foods do not have the nutritional density or the bioavailability that human milk has.

A Honduran study compared infants who were exclusively breastfed for six months to infants who were introduced to solid foods at four months with continued breastfeeding. Infants receiving solid foods significantly reduced their breast milk intake. The researchers concluded that exclusive breastfeeding until six months of age is beneficial and should be recommended because the advantages of exclusive breastfeeding until age six months of age outweigh the disadvantages (Boresen, 1995).

## **6. Introduction to Infant Formula**

There are many reasons women choose to give infant formula to their baby. Many women think that breastfeeding is much too time consuming and confining. Some women choose to feed their baby infant formula because they do not want to have to worry about breastfeeding in public. Another perceived advantage to feeding infant formula is that others such as a spouse, friend, or babysitter can feed the infant when the mother is away. Since others will be able to feed the infant, formula feeding will also take some pressure off of the mother. The mother will not be the only one who can feed the infant.

Giving infant formula may seem more convenient in many ways in today's society; however, the same advantages can be achieved while breastfeeding with the use of a breast pump. Breast pumps can make breastfeeding easier for the mother. A breast pump is helpful because it allows the mother to express and store her milk for later use. A woman can pump her breast milk then keep it in the refrigerator until it is needed. When the mother and the infant are separated at feeding times, such as when the woman returns to work, a breast pump comes in handy. Breast milk can be taken to the babysitter or daycare. With the use of a breast pump, others are able to feed the infant when he/she is hungry and the infant will still be getting the benefits of breast milk.

A breast pump is also beneficial to the mother because it can help relieve the breast. Sometimes breasts become engorged, making it difficult for the baby to latch on properly. A breast pump can be used to pump milk to help soften the nipple and areola. Some women have flat or inverted nipples. A breast pump can help draw them out. It can also be used to maintain the milk supply. Pumping can stimulate the production of milk in cases where the milk supply is low. Breast pumps are also used to provide breast milk in cases where the baby is too ill or premature to breastfeed.

Finally, it is somewhat time consuming to breastfeed, but it is also time consuming to bottle feed an infant. Many women do not take into consideration the time it takes to wash and prepare bottles, shop for formula, and go to the doctor. Studies have shown that formula fed infants are sick more often than breastfed infants (Beckford, 2003).

### **7. Not Addressing Breastfeeding Problems Early**

Despite recommendations that a mother breastfeed her infant for at least one year, most women that begin breastfeeding stop after only a few months. Many women run into problems early in the neonatal period that may lead to the discontinuation of breastfeeding. The trend toward shorter stays in the hospital

may be associated with difficulty in resolving breastfeeding problems early. (Heck, 2001).

Many mothers give up breastfeeding within the first six weeks because they run into problems while breastfeeding. The most common problem with breastfeeding is the perception of insufficient milk or the baby being hungry. Mothers who have difficulties breastfeeding and stop breastfeeding early are less likely to breastfeed any children they may have later in life than mothers who do not have any trouble with breastfeeding (Ingram, 2001).

One study in *Lancet* looked at the milk production of 22 mothers. Milk output of each mother was measured at one week and four weeks after giving birth to their first and second babies. This study found that considerably more breast milk was produced at one week after the birth of their second baby than at the same time with their first baby. Also the increase in the amount of milk was greatest for those women with the lowest milk output at one week after their first baby was born. It was also found that these mothers spent less time feeding their second baby than their first. Greater volumes of milk were also produced four weeks after giving birth to the second baby when compared to the first baby. Health professionals should encourage women to breastfeed all of their children, no matter what their experience was with the first child (Ingram, 2001).

## **8. Marketing of Infant Formula**

The marketing of infant formula negatively affects breastfeeding. Many manufacturers supply pediatricians and hospitals with free samples of their products, which are then given to new mothers. Formula companies donate much of the breastfeeding literature provided by physicians. These materials contain formula samples, discount coupons, and vouchers for free cases of infant formula. A mother who receives a free formula sample from her hospital or doctor may think that the hospital or doctor endorses the product. Giving a new mother these items is associated with a shorter duration of breastfeeding. New mothers may perceive bottle-feeding with infant formula to be more convenient than breastfeeding and just as nutritious as breastfeeding.

One study in *Pediatrics* observed the effect of discharge samples on duration of breastfeeding. This study compared the duration of breastfeeding when women received formula in a discharge pack when leaving the hospital to women that received a breast pump with their discharge pack. The women that received a breast pump did not receive any formula in their discharge pack. Results of this study showed that women receiving a discharge pack containing samples of formula breastfed for a shorter period of time than women who



received a breast pump and in their discharge pack when leaving the hospital (Dungy, 1998).

Another reason for the low initiation and duration rates in America may be that the media portrays formula feeding as the norm. Many women do not even consider breastfeeding due to the advertising of infant formulas in the media. When advertising infant formula in the media, the benefits of the formula are shown. The media also makes formula feeding look very easy. The benefits of breastfeeding over the use of formula are never discussed (Meyers, 2001).

Baby formula companies produce books and videos that provide information on breastfeeding. Free formula samples or discount coupons often come with these books and videos. In addition, they contain a lot of advertisements for the company's product.

The World Health Organization (WHO) states that,

“Advertising infant formula as a substitute for breast milk competes unfairly with normal, healthy breastfeeding, which is no subject to advertising, yet it is the safest and lowest-cost method of nourishing an infant. Advertising infant formula as a substitute for breast milk favors uninformed decision making, bypassing the necessary advice and

supervision of the woman's physician or health worker" (World Health Organization, 2001, ¶ 1).

No infant formula can provide the numerous health advantages that breast milk can provide to an infant. The objectives of advertising in the media include ensuring the best quality and the lowest cost and creating an informed public. These objectives are definitely not achieved in the advertising of infant formula (World Health Organization, 2001).

## **I. Conclusion**

It is unanimous that breastfeeding is the ideal food for the infant. All studies show that breastfeeding has a number of advantages over giving infant formula. Feeding an infant breast milk is beneficial in many ways, not only for the infant, but also for the mother, the family, employers, the community, and society. Enhancing the immune system, resistance to infectious diseases, nutritional and growth benefits, and developmental benefits are all benefits of breastfeeding for the infant. Mothers receive hormonal, psychological, and physical benefits from breastfeeding. Socioeconomic benefits are provided to the family, employer, community and the nation when an infant is breastfed. Breastfeeding greatly reduces health care costs because infants that are breastfed are shown to be healthier than their non-breastfed counterparts. There is less absenteeism from work due to a parent staying home with a sick child. Finally,

the family saves money because they do not have to buy expensive formula for the infant and the parents do not have to miss work because their child is ill.

The United States is not currently meeting the goals set for breastfeeding. Healthcare workers and others working with the breastfeeding population need to determine how to increase the number of women that breastfeed their infant. Encouragement and support need to be provided by all healthcare workers and education is a must. By helping to meet the breastfeeding goals, it would reduce healthcare costs and improve the health of the nation overall.

Providing breast pumps as a part of the WIC Program may help to increase the number of women that breastfeed their babies. Breast pumps would make it easier for women to return to work while they are still breastfeeding. Evaluating The Breast Pump Distribution Program in the County A WIC Program is important. This evaluation could help to increase funding, thus increase the number of breast pumps and the amount of breastfeeding education that WIC is able to provide. This may help more mothers participating in the WIC Program to obtain breast pumps, which in turn may help them increase the duration of breastfeeding. This will be a start to helping decrease health care costs in County A and could improve the health of the residents in this county. This study may encourage other WIC Programs to implement a Breast Pump Program, which

would help to decrease healthcare costs in the United States and improve the health and well being of the entire nation.

## **Chapter 3**

### **Methods**

#### **A. Introduction**

The purpose of this chapter is to describe the research methodology used to conduct this study. The research methods were based on the objectives of this study. This chapter consists of the research design, subject selection, instrumentation, data collection, data analysis and problems encountered during data collection.

#### **B. Research Design**

The study conducted was descriptive using a self-report questionnaire to determine the infant feeding practices among breastfeeding mothers participating in the WIC Program and the use of The WIC Breast Pump Distribution Program. The purpose of this study was to evaluate The WIC Breast Pump Distribution Program in the County A Women, Infants and Children (WIC) Program based on initiation and duration rates among WIC participants involved in the study.

The type of evaluation used in this study is a summative evaluation. A summative evaluation focuses on the outcomes of a program and is performed after the conclusion of a program. A summative evaluation was used in this study to focus on the outcomes of The WIC Breast Pump Distribution Program. Outcomes of the program could be determined because the women that were

asked to participate in the study had stopped breastfeeding thus stopped using the program. This evaluation looks at the effects the program had on the practices and attitudes of the study participants.

The WIC Breast Pump Distribution Program is based on the logic model. This model includes inputs, outputs, and outcomes. The inputs are what the program invests such as staff, time, money, and materials. The WIC Breast Pump Distribution Program invests the WIC staff, time, and money to implement the program and educate the participants. This program also invests materials such as breast pumps to give to the participants.

Outputs of a program include what the program does and who it reaches. The WIC Breast Pump Distribution Program enables the WIC staff to educate women about the benefits of breastfeeding and train the participants to clean their new breast pump correctly. This program allows eligible women in the WIC Program to obtain a breast pump that may help to facilitate and encourage breastfeeding. The WIC Breast Pump Distribution Program reaches all eligible WIC Program participants that would like to participate in the program. Eligibility is based on a number of factors. Milk supply issues, multiple birth, and returning to work or school are just a few reasons that women may be eligible for the program. More about eligibility for this program is explained in chapter 1.

Outcomes of the program were determined in this study with the use of the questionnaire. Short-term outcomes of the program were determined by asking questions that would help to determine participants' attitudes toward the program and the effects the program had on participants' breastfeeding experiences. The outcomes of the program help to determine the strengths and weaknesses of the program and will ultimately result in making changes to help the program become user-friendlier. Medium-term outcomes were declared in this study when discussing participants' behaviors, practices, and decisions related to breastfeeding. Long-term outcomes were discussed in the literature review. This includes how increasing the number of women that breastfeed through the use of The Breast Pump Distribution Program would have an effect on the community and society.

### **C. Subject Selection**

Subjects in this study were enrolled in the WIC Program in a Wisconsin county and were involved in The WIC Breast Pump Distribution Program. Women that were enrolled in the WIC Program and breastfed their babies, but did not use a breast pump also participated in this study. This group was used as the control group. Twenty-seven women between the ages of 18 and more than 35

years of age participated in the study. All of the women had completed The Breast Pump Program at the time of the study.

The participants in this study were not randomly selected. A convenient sample was used to select the subjects. All women participating in the WIC Program and breastfed a baby with or without the help of a breast pump was asked by the WIC staff to participate in the study.

#### **D. Instrumentation**

The instrument used in this study consisted of a cover letter (Appendix A) explaining the purpose of the study, a consent form (Appendix B) explaining that participation in the study was entirely voluntary and that the information collected in the study would be kept in the strictest confidence. The instrument also consisted of a questionnaire (Appendix C) used to obtain information about participant attitudes toward breastfeeding and using a breast pump and maternal and infant feeding practices among WIC Program participants.

##### **1. The WIC Breast Pump Distribution Program Evaluation**

###### **Questionnaire**

The WIC Breast Pump Distribution Program Evaluation Questionnaire was developed by the researcher and used to collect information about infant feeding practices of mothers in the WIC Program. The questions on the questionnaire was based on the summative evaluation method. The questions



were asked in such a way that intended to obtain outcomes or results of the program.

Each participant was requested to circle the statements or fill in the blanks in the questionnaire that apply to her or her infant. The first section of the questionnaire contained demographic information about the mother and her infant. Questions regarding when the mother started breastfeeding, how long she breastfed her infant, and the frequency of the use of a breast pump were also asked. In addition, information about infant feeding practices was collected. Questions about the mother's attitude towards breastfeeding and using a breast pump were asked in the questionnaire. Each participant was also asked about the strengths and weaknesses of the program.

After the questionnaire was developed, the research advisor and the WIC directors from two counties read and revised the questionnaire. The following changes were made.

- Change certain words or phrases to decrease the reading level of the questionnaire
- Change certain words or phrases to clarify questions
- Bold the font of the directions
- Add more questions that relate to the subject matter
- Number each answer choice to help with data analysis

## **2. Pilot Study**

A pilot study was conducted with a WIC Program in a county in Wisconsin that is similar to County A. The purpose of the pilot study was to determine if the questionnaire was clear and easy to read for the participants. The WIC Program participants in the pilot county were able to suggest changes or make comments for improvement on the questionnaire. The only changes that were suggested are as follows:

- Change certain words or phrases to decrease the reading level of the questionnaire
- Increase spacing between questions to make the questionnaire easier to read

The pilot study consisted of eight WIC participants that used The WIC Breast Pump Distribution Program in a county similar to the county being studied. Each participant in the pilot study was given a cover letter (Appendix D) explaining the purpose of the study, a consent form (Appendix B), and The WIC Breast Pump Distribution Evaluation Questionnaire (Appendix C). These documents were distributed by the WIC staff in the pilot county.

### **E. Data Collection**

Before participating in the study, each of the subjects were given a cover letter explaining the purpose of the study and were verbally told about voluntary

participation and rights to withdraw from the study at anytime. A consent form was also provided to each subject. This form stated that participation in the study was entirely voluntary. By signing this form, each participant gave her consent to participate in the study.

The questionnaires were then given to the WIC Program staff. The staff gave each of the subjects The WIC Breast Pump Distribution Evaluation Questionnaire to complete. The subjects then gave the questionnaire to the staff when completed. The researcher collected the questionnaires from the months of March to June 2003.

#### **F. Data Analysis**

All statistical analyses were performed using the Statistical Package for the Social Sciences, Version 10.0 (SPSS, Inc., Chicago, Illinois). Descriptive statistics such as mean, median, and standard deviation were used to determine relationships between the maternal and infant feeding practices and The Breast Pump Distribution Program. Frequencies and percents were also determined. Crosstabulations were carried out to summarize relationships between pairs of variables. The strength of the relationships between different pairs of variables was computed using crosstabulations.

### **G. Problems Encountered in Data Collection**

Data collection took much longer than expected. The WIC Program staff stated that due to their busy schedule, they had trouble remembering to give the WIC Program participants the questionnaire when they came into the WIC office. The researcher had no contact with the participants. In this study, the questionnaire was handed out to WIC participants only during each participant's visit to the WIC clinic. This made it difficult to acquire enough subjects to participate in the study.

### **H. Summary**

This chapter explained the procedures used in this study for collecting and analyzing the data. The information received will provide data that will help the WIC Program in County A improve The WIC Breast Pump Distribution Program to better meet the needs of the participants. The next chapter will discuss the results of this study.

## **Chapter 4**

### **Results of the Study**

#### **A. Introduction**

The purpose of this study was to evaluate the effectiveness of The WIC Breast Pump Distribution Program in a Wisconsin county. This program is a new program that enables the WIC Program in this county to offer breast pumps to eligible WIC participants. The ultimate goal of The WIC Breast Pump Distribution Program is to support initiation and a longer duration of breastfeeding among mothers involved in the program.

In order to determine funding for the program, participant needs such as training or procedure changes and coordination with Medicaid, this program needs to be evaluated. The purpose of this study was to evaluate The WIC Breast Pump Distribution Program used in the County A WIC Program based on breastfeeding initiation and duration rates.

The following objectives were stated in this study:

1. To evaluate the effect of providing breast pumps to WIC participants on initiation and duration rates through the use of a questionnaire.
2. To determine the frequency of use of the breast pumps among mothers participating in the WIC Program through the use of a questionnaire.

Data were obtained utilizing a self-report questionnaire. Participants completing the questionnaire were enrolled in the WIC Program in an anonymous county in Wisconsin that is referred to in this paper as County A. These participants participated in The WIC Breast Pump Distribution Program. Women participating in the County A WIC Program that breastfed an infant, but did not use a breast pump also completed the questionnaire. This group was to be used as a control group.

The following section will address responses to the questionnaire from the WIC Program participants enrolled in The WIC Breast Pump Distribution Program in County A. It will also address responses from the WIC Program participants that breastfed an infant, but did not participate in The WIC Breast Pump Distribution Program. The results will be discussed further in chapter five.

## **B. Results**

Twenty-seven women participated in this study. Three of the women taking part in this study did not participate in The WIC Breast Pump Distribution Program. Twenty-four of the women in this study participated in The WIC Breast Pump Distribution Program.

The demographic characteristics of the subjects participating in The WIC Breast Pump Distribution Program are shown in Table 1. The demographic characteristics of the subjects that did not participate in the program are shown in

Table 2. The characteristics in the tables include age, ethnic background, marital status, and employment status. The ages of the mothers participating in this study ranged from 18 years of age to more than 35 years of age.

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**Table 1**  
Demographic profile of women in the WIC Breast Pump Distribution Program

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<b>Demographic characteristics</b>	<b>Number of participants</b>	<b>Percentage of participants</b>
<b>Mother's age in years</b>		
18-23	10	41.7
24-29	7	29.2
30-35	6	25.0
>35	1	4.2
<b>Mother's ethnic background</b>		
African American	2	8.3
Asian	1	4.2
Caucasian	20	83.3
Native American	0	0
Multiracial	1	4.2
<b>Marital status</b>		
Never Married	7	29.2
Married	15	62.5
Divorced	2	8.3
<b>Employment status</b>		
Full-time	6	25.0
Part-time	10	41.7
Unemployed	8	33.3

---

Table 1 shows that the majority of the participants identified their ethnic background to be Caucasian (n=20). This represents 83.3% of the participants in The WIC Breast Pump Distribution Program. Most of the participants identify themselves as married and their employment status as part-time while using the breast pump.



**Table 2**  
Demographic profile of women not participating in the WIC Breast Pump  
Distribution Program

<b>Demographic characteristics</b>	<b>Number of non-participants</b>	<b>Percentage of non-participants</b>
<b>Mother's age in years</b>		
18-23	1	33.3
24-29	0	0
30-35	1	33.3
>35	1	33.3
<b>Mother's ethnic background</b>		
African American	0	0
Asian	0	0
Caucasian	3	100.0
Native American	0	0
Multiracial	0	0
<b>Marital status</b>		
Never married	1	33.3
Married	2	66.6
Divorced	0	0
<b>Employment status</b>		
Full-time	0	0
Part-time	0	0
Unemployed	3	100.0

Table 2 shows that all of the women that breastfed their infants without the use of a breast pump were Caucasian. All of these women were also unemployed while breastfeeding their infant. The ages of these women varied.

Table 2 also shows that two out of the three participants that were not involved in the program were married.

When comparing Table 1 and Table 2 to national data and county data, they are very similar. These tables show that most of the participants in the study were married. Two out of the three participants that breastfed without the use of a breast pump were married. Nationally, women that breastfeed an infant are more likely to be married than single or divorced (Shelton, 1997). Also research has shown that in the United States Caucasian women are more likely to breastfeed an infant than any other race (Shelton, 1997). In the county in which the study was conducted, the population's ethnicity is mainly Caucasian. The same result was found in this study. Twenty three out of twenty-seven participants were Caucasian.

The heights and weights of all participants were asked in the questionnaire. Women ranged in height from five feet to five feet ten inches. Each woman in this study also was asked her approximate weight after stopping breastfeeding or using the breast pump. These values ranged from 120 pounds to 234 pounds. From the heights and weights given, the body mass index (BMI) of each woman was calculated. The BMI was calculated by dividing each woman's weight in kilograms by each woman's height in meters squared. The BMI could not be calculated for one participant because this participant's weight was not

given. The BMI values ranged from 19.24 to 39.02. The mean, median and standard deviation of the heights, weights, and BMI of the study participants is given in Table 3. BMI was used to classify each participant into one of the following weight categories: underweight, normal, overweight and obese. The number of participants in each weight category is shown in Table 4.

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**Table 3**  
Height, weight, and BMI of mothers in the county A WIC Program

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	<b>Height in inches</b>	<b>Weight in pounds</b>	<b>BMI</b>
Mean	65.15 inches	162.46 pounds	26.96
Median	65.00 inches	145.00 pounds	25.93
Standard Deviation	2.74 inches	34.41 pounds	5.58

---

Table 4 shows that 46.15% of the WIC Program participants were of normal weight. However, over half of the participants had a BMI that categorized them into the overweight or obese category. Almost 31% of the participants were overweight and approximately 23% were obese. One of the participants did not report her weight thus her BMI is not known.

**Table 4**  
 BMI classifications among WIC Program participants

<b>BMI</b>	<b>Frequency</b>	<b>Percent</b>
<18.5 Underweight	0	0.00
19 to 24.9 Normal	12	46.15
25 to 29.9 Overweight	8	30.77
>30 Obese	6	23.06
Total	26	100.00
Missing Data	1	N/A

The results from this study show that the majority of the mothers were overweight or obese. Breastfeeding is thought to help mothers lose weight after pregnancy. This was not determined in this study because the mothers' weight after giving birth and the mothers' usual body weight was not recorded.

Demographic data about the infants involved in the study was also determined. Information such as the infants' gender, age, current weight, and weight at birth was recorded. Thirteen of the infants in this study were male and fourteen were female. Birth weights of the infants ranged from 5.00 pounds to 9.56 pounds. Current weights ranged from 9.50 to 27.00 pounds. There was a

wide range in ages among the infants in this study. The ages of the infants ranged from two months to more than twelve months of age. This data is shown in Table 5.

---

**Table 5**  
Infants' age, birth weight, and current weight

---

	<b>Infant age in months</b>	<b>Infant birth weight in pounds</b>	<b>Infant current weight in pounds</b>
Mean	9.52	7.20	18.01
Median	7.00	7.00	16.81
Standard Deviation	6.84	1.00	4.15
Minimum	2	5.00	9.50
Maximum	>12	9.56	27.00

---

Table 6 shows the number of women in The WIC Breast Pump Distribution Program that stated if knowing they could get a breast pump from WIC or Medical Assistance (MA) affected the decision to start nursing their infant. Table 7 shows how the women that did not participate in The Breast Pump Distribution Program answered this same question.

---

**Table 6**

Effect of knowing you could get a breast pump on participant's decision to breastfeed

---

<b>Program participant responses</b>	<b>Number</b>	<b>Percent</b>
Yes	9	37.5
No	15	62.5

---

Table 6 shows that The WIC Breast Pump Program helped nine out of twenty-four people decide to breastfeed their infant. Fifteen of those that used the pump stated that the program did not affect their decision to breastfeed.

Table 7 shows that all of the participants that did not use a pump were already planning to breastfeed their infants. The program did not help them when making their decision to breastfeed. This table also shows that two out of the three participants that did not use the program did not know about the program.

---

**Table 7**

Effect of knowing you could get a breast pump on non-participant's decision to breastfeed

---

<b>Non-program participant responses</b>	<b>Number</b>	<b>Percent</b>
Yes	0	0
No	1	33.3
Did not know	2	66.7

---

Approximately 79% of the women in the study found out about The WIC Breast Pump Distribution Program through WIC personnel. Three women stated that they found out about getting a pump from WIC/MA through a physician or a nurse and one stated that she found out from a friend. The three participants that did not use a pump were not included in Table 8.

---

**Table 8**Frequencies of how subjects were informed about getting a pump

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<b>How subjects were informed</b>	<b>Number of participants</b>	<b>Percent</b>
Physician/Nurse	3	12.5
WIC Personnel	19	79.1
Friend	1	4.2
Other	1	4.2
Total	24	100

---

The American Pediatric Association recommends that a woman nurse her infant for at least twelve months. During the first six months, the infant should be breastfed without the introduction of solid foods. Solid foods should be introduced only after the infant is six months of age.

Table 9 shows that the number of months in which women with a pump breastfed their babies varies a great deal. Nineteen of the twenty-four participants breastfed for less than the recommended twelve months. Only five (20.9%) of the program participants in the study breastfed for twelve or more months.

Table 9 also shows the number of months in which women that did not use a breast pump breastfed their infants. One woman that did not use a pump



breastfed her infant for only one month. Another woman breastfed her infant for nine months and finally, one woman breastfed her infant for more than 12 months.

**Table 9**

Number of months participants and non-participants nursed their infants

<b>Number of months</b>	<b>Number of participants</b>	<b>Percent of participants</b>
< 1	2	8.3
1	1	4.2
2	1	4.2
3	5	20.8
4	1	4.2
5	6	25.0
6	1	4.2
7	1	4.2
8	0	0
9	1	4.2
10	0	0
11	0	0
12	1	4.2
> 12	4	16.7
<b>Number of months</b>	<b>Number of non-participants</b>	<b>Percent of non-participants</b>
1	1	33.3
9	1	33.3
>12	1	33.3

The actual number of months spent breastfeeding differed greatly from the length of time the mothers had planned to breastfeed their infants. Table 10 shows the number of months that each participant planned to nurse her infant. Most women using a pump planned to nurse for at least six months. Seven women planned to nurse for six months. Twelve of the twenty-four women using

a pump planned to breastfeed for at least 12 months; however, only five women reached this goal. When comparing this data to the data collected from participants not using a pump, it was found that two out of the three women that did not use a pump planned to nurse for twelve months. Only one of these women achieved this goal. One participant only planned to nurse for one month.

---

**Table 10**  
Number of months participants and non-participants planned to breastfeed

---

<b>Number of months</b>	<b>Number of participants</b>	<b>Percent of participants</b>
1	1	4.2
2	0	0
3	1	4.2
4	1	4.2
5	0	0
6	7	29.2
7	0	0
8	1	4.2
9	0	0
10	0	0
11	0	0
12	7	29.2
> 12	5	20.8
Did not know	1	4.2
<b>Number of Months</b>	<b>Number of non-participants</b>	<b>Percent of non-participants</b>
1	1	33.3
12	2	66.6

---

Breast pumps are thought to help a woman breastfeed an infant longer and help her meet her breastfeeding goal. Table 11 compares the number of months the participants and non-participants planned to breastfeed their infants to the number of months they actually breastfed their infants.

---

**Table 11**

Number of months participants and non-participants planned to breastfeed compared to the number of months they actually breastfed

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<b>Participant</b>	<b>Number of months planned to breastfeed</b>	<b>Number of month actually breastfed</b>
1	1	<1
2	3	3
3	4	<1
4	6	5
5	6	4
6	6	>12
7	6	5
8	6	>12
9	6	>12
10	6	3
11	8	1
12	12	3
13	12	2
14	12	5
15	12	12
16	12	5
17	12	5
18	12	9
19	>12	7
20	>12	6
21	>12	5
22	>12	6
23	>12	>12
24	Did not know	3
<b>Non-participant</b>	<b>Number of months planned to breastfeed</b>	<b>Number of months actually breastfed</b>
1	1	1
2	12	9
3	12	>12

---

Women discontinue breastfeeding for a number of reasons. Some of these reasons include going back to work or school, sore nipples, and not having enough milk to meet the infant's needs. Research has shown that most mothers in the United States stop nursing due to milk supply concerns (Shelton 1997). The subjects in this study were asked why had they stopped nursing their infant. These responses are shown in the Table 12.

**Table 12**  
Reasons for discontinuing breastfeeding among participants and non-participants

<b>Participant response</b>	<b>Number of participants</b>	<b>Percent of participants</b>
Sore nipples	2	8.3
Mother's choice	2	8.3
Milk supply concerns	5	20.8
Baby's choice	6	25.0
Went back to school/work	2	8.3
Baby is too old	3	12.5
Other	4	16.7
<b>Non-participant response</b>	<b>Number of non-participants</b>	<b>Percent of participants</b>
Milk supply concerns	1	33.3
Baby's choice	1	33.3
Baby is too old	1	33.3

The subjects in this study stopped nursing for a variety of reasons. Even though research shows that most women in the United States terminate breastfeeding due to milk supply concerns, only 20.8% of the participants showed this to be the case in this study. Six (25%) of the participants stated that it was the baby's choice to stop nursing. Other participants stated various reasons for discontinuing breastfeeding. Those participants that did not use a pump stated that they stopped nursing their infant due to milk supply concerns, baby's choice, and the baby is too old to nurse.

In the questionnaire, it was asked whether a breast pump helped the participant meet her nursing goal. Even though only a few participants actually met their nursing goal, sixteen (66.7%) participants stated that having a breast pump helped to meet their nursing goal and eight (33.3%) stated that it did not help to meet this goal. This shows that breast pumps helped two-thirds of the participants using a pump come closer to meeting their nursing goals.

Problems using a breast pump may be a reason that a mother stops nursing her infant. This was not shown to be true in this study. Only four women in this study had problems with their breast pump, however, none of these women stated that this was a reason for the termination of breastfeeding. Twenty women did not have any problems with their pump.

A breast pump is a useful tool in helping a mother breastfeed her infant. Breast pumps can be used for a variety of reasons. Most mothers in this study requested a breast pump because they returned to school or work or because they did not have enough milk. Seven people stated that they needed a breast pump because they returned to school or work and seven stated that they did not have enough milk. Four reported that their baby could not latch on. The six other participants stated that they stopped nursing for reasons such as missed feedings, medical reasons, etc. This data is shown in Table 13.

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**Table 13**  
Reasons mothers in the County A WIC Program requested a breast pump

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<b>Participant Response</b>	<b>Number of participants</b>	<b>Percent</b>
Missed feedings	2	8.3
Returned to work or school	7	29.2
Medical reasons	1	4.2
Baby could not latch on	4	16.7
Flat/inverted nipples	1	4.2
Engorgement	1	4.2
Not enough milk	7	29.2
Wanted to feed my infant breast milk but not nurse my infant	1	4.2

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When using a breast pump, it is important that a mother pump her milk a number of times each day emptying the breasts completely at each pumping. This will help the mother make enough milk to meet her baby's needs. The maximum number of times the pump was used in 24 hours was recorded on the questionnaire. The results are reported in Table 14.

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**Table 14**  
The maximum number of times participants used a pump in 24 hours

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<b>Response (# of times)</b>	<b>Number of Participants</b>	<b>Percent of Participants</b>
1-2	7	29.2
3-4	5	20.8
5-6	9	37.5
7-8	2	8.3
9-10	0	0
11-12	0	0
>12	1	4.2

---

Table 14 shows that 21 out of 24 of the study participants pumped six or fewer times in 24 hours. Seven of these women stated that they only pumped one to two times per day. Five women stated that they pumped three to four times in 24 hours and nine women stated that they pumped five to six times per day.

The maximum number of times that a mother fed pumped breast milk to her infant was recorded. The results are shown in Table 15.

**Table 15**  
Maximum number of times pumped breast milk was fed to the infant

<b>Response (# of times)</b>	<b>Number of participants</b>	<b>Percent of participants</b>
1-2	2	8.3
3-4	5	20.8
5-6	7	29.2
7-8	3	12.5
9-10	0	0
11-12	0	0
>12	7	29.2

Table 15 illustrates the number of times that mothers fed pumped breast milk to their infant varied a great deal. Five people stated that pumped milk was fed to the infant 3-4 times per day, seven women fed their child pumped milk 5-6 times a day and seven women stated that their child was fed the pumped milk more than twelve times a day.

**Table 16**

Comparison of the amount of breast milk fed to the infant in 24 hours to the amount of formula fed to the infant in 24 hours

<b>Participant</b>	<b>Ounces of breast milk fed to infant</b>	<b>Ounces of formula fed to infant</b>
1	4 oz	8 oz
2	2 oz	> 8 oz
3	2 oz	> 8 oz
4	3 oz	> 8 oz
5	3 oz	> 8 oz
6	4 oz	> 8 oz
7	4 oz	> 8 oz
8	4 oz	Did not give infant formula
9	> 8 oz	Did not give infant formula
10	> 8 oz	Did not give infant formula
11	> 8 oz	Did not give infant formula
12	> 8 oz	1 oz
13	> 8 oz	1 oz
14	> 8 oz	1 oz
15	> 8 oz	3 oz
16	> 8 oz	3 oz
17	> 8 oz	4 oz
18	> 8 oz	5 oz
19	> 8 oz	6 oz
20	> 8 oz	6 oz
21	> 8 oz	>8 oz
22	> 8 oz	> 8 oz
23	Don't know	> 8 oz
24	Don't know	4 oz
<b>Non-participant</b>	<b>Ounces of Breast Milk Fed to Infant</b>	<b>Ounces of Formula Fed to Infant</b>
25	Don't know	4 oz
26	Don't know	Did not give infant formula
27	Don't know	Did not give infant formula

The data in Table 16 does not seem to be accurate. If the data were accurate, some of the infants would not receive enough milk or formula to meet their nutrient needs. This question may have been misunderstood among participants. The participants may have been guessing the amount of breast milk and formula that was fed to their infants.

Over half of the participants fed their infant more than eight ounces of breast milk in 24 hours. All of the participants that did not use a pump stated that they did not know how many ounces of breast milk were fed to the infant in 24 hours. Most women in this study gave formula to their baby. Twenty women that used a pump also gave infant formula to their baby. Two out of the three women that did not use a pump, never gave infant formula to their baby. Table 16 compares the amount of breast milk fed to the infant to the amount of formula fed to the infant. Table 16 shows that when more breast milk was fed to the infant less formula was fed to the infant and visa versa.

Infant formula was given for various reasons. Table 17 gives the various reasons that participants and non-participants gave infant formula to the infants. Seven pump-users stated that they gave their infants formula because they did not have enough breast milk. This seems to be the most common reason for the termination of breastfeeding in the United States. Four stated that they gave formula because they needed to return to work or school. The non-pump user

who gave her infant formula stated that she used formula because the infant was still hungry after breastfeeding. Two of the non-pump users never gave infant formula to their infants.

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**Table 17**  
Reasons participants and non-participants gave infant formula to infants

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<b>Participant response</b>	<b>Number of participants</b>	<b>Percent of participants</b>
Missed feedings	2	10.0
Returned to work or school	4	20.0
Others can feed the infant	1	5.0
Medical reasons	1	5.0
Not enough milk	7	35.0
Baby is still hungry	1	5.0
Other	4	20.0
<b>Non-participant response</b>	<b>Number of non-participants</b>	<b>Percent of non-participants</b>
Baby is still hungry	1	33.3

---

In the United States, research has shown that 33% of women return to work within three months after giving birth and 66% return to work within six months (United States Department of Health and Human Services, 2002).

However, this study showed a slightly lower number of women that returned to

work. Table 18 shows the results of this study. Less than nineteen percent of the women in this study returned to work within three months of giving birth and about fifty-five percent returned to work within six months. Among the women in this study, almost 41% of the women did not return to work or school. All of the women that did not use a breast pump did not return to work or school when breastfeeding.

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**Table 18**  
Age of infants when participants and non-participants returned to work or school

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<b>Number of months</b>	<b>Number of participants</b>	<b>Percent of participants</b>
< 1	1	4.2
1-2	4	16.7
3-4	8	33.3
4-5	2	8.3
6-7	1	4.2
Did not return to work/school	8	33.3
<b>Number of months</b>	<b>Number of non-participants</b>	<b>Percent of non-participants</b>
Did not return to work/school	3	100

---

Research has shown that negative attitudes about breastfeeding by employers can be a barrier to the continuation of breastfeeding. However, only

12.5% of mothers using a pump in this study said that their employer was not supportive of pumping at work. Six (25%) responded that their employer was supportive of pumping at work. Table 19 shows whether the employers of the participants in this study supported pumping at work.

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**Table 19**  
Employer support of pumping at work

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<b>Participant response</b>	<b>Number of participants</b>	<b>Percent of participants</b>
Yes	6	25.0
No	3	12.5
Not Employed	8	33.3
Choose not to pump at work	6	25.0
Do not know	1	4.2

---

Attitudes toward breastfeeding and using a breast pump may determine how long a woman breastfeeds her infant. The mothers in this study were asked how they felt about breastfeeding and using a breast pump. The responses are shown in the Table 20 and Table 21. In each response category, the number of women that answered that response is given.

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**Table 20**Attitudes toward breastfeeding and using the breast pump among pump-users

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Attitude Statement	Response				
	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
I enjoy breastfeeding	1	0	3	7	14
Breastfeeding is frustrating	13	5	3	2	0
Using a breast pump can be frustrating	6	3	4	8	3
Using a breast pump is very helpful	0	1	3	9	11
Using a breast pump is easy for me	0	5	6	7	6
The breast pump program has made my life easier	0	1	5	7	11
The breast pump program helped me breastfeed my infant	0	2	3	7	12
Breastfeeding helped me lose weight	6	5	2	5	6
Breast pump helped me breastfeed longer	2	1	5	4	12

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Table 20 shows that most of the participants that used a breast pump enjoyed breastfeeding and did not think that it was frustrating. Most also thought that the breast pump was very helpful and made life easier, but agreed that using the pump could be frustrating. Eleven people agreed that breastfeeding helped them lose weight and eleven disagreed with this statement. Sixteen of the twenty-four participants that used a pump agreed that the breast pump helped them to breastfeed their infant longer.

Seventy five percent (n=18) of the women using a pump stated that having a breast pump did affect the decision on how long she nursed her infant. Six (25%) said that this did not affect the decision on how long she nursed her infant.

Non-pump users were also asked to respond to these same attitude statements. Some of the statements did not apply to these participants since they did not use a breast pump. The statements that did not apply are not shown in the table below.

**Table 21**  
Attitudes about breastfeeding among non-pump users

Attitude statement	Response				
	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
I enjoy breastfeeding	0	0	0	2	1
Breastfeeding is frustrating to me	2	0	0	1	0
Breastfeeding helped me lose weight after giving birth to my infant	1	2	0	0	0

When comparing attitudes of non-pump users to pump-users, they are very similar. Like the pump-users, the non-pump users enjoyed breastfeeding. Two of the three non-pump users disagreed that breastfeeding was frustrating. Unlike the pump-users, none of the non-pump users thought that breastfeeding helped them lose weight after giving birth.

The type of breast pump used may be a factor in determining a woman's breast pumping experience. The La Leche League reports that double electric breast pumps pump milk twice as fast than single manual pumps and are much

easier to use. Also electric pumps most resemble a baby’s natural sucking pattern; therefore electric pumps are the most comfortable and the best for maintaining a mother’s milk supply (Dermer 2003).

Most of the participants in this study used a double electric breast pump. Only six participants used a single manual breast pump and two reported using another type of pump. This data is shown in Table 22.

**Table 22**  
Types of pumps that were used by The WIC Breast Pump Program participants

<b>Type of pump</b>	<b>Number</b>	<b>Percent of participants</b>
Double electric rental	7	29.2
Double electric personal	9	37.5
Single Manual	6	25
Other	2	8.3

Fourteen of the twenty-four participants that used a pump obtained the pump from WIC. Ten of the participants received a pump from somewhere other than WIC. Due to limited funding, it is recommended that The WIC Program refer all eligible participants that meet the criteria to receive a breast pump to the Medical Assistance (MA) Program. In this study sixty percent of the participants

that did not receive a pump from WIC were referred to MA, however, forty percent were not referred to the MA Program.

Only 54% of the study participants said that the WIC staff showed them how to use the pump before they took it home. Eleven (45.8%) out of twenty-four people stated that the WIC staff did not show them how to use the breast pump before they took the pump home.

After using a breast pump, it is important to clean the breast pump well to avoid bacteria growth in the pump. All of The WIC Breast Pump Distribution Program participants should be shown how to clean the breast pump properly. However, exactly half of the respondents stated that the WIC staff did not show them how to clean the pump before they took it home.

When asked if the WIC staff was available to answer questions, fourteen of the participants stated that the staff was always available to answer questions. Ten women stated that they did not have any questions. None of the program participants said that the WIC staff was unavailable to answer questions. This shows that the WIC staff was available to answer questions from all of the participants in the study when they had questions.

When asked if there was any concern about breastfeeding, breast pumps, or The WIC Breast Pump Distribution Program only two people had concerns. Twenty-five of the WIC Program participants did not have any concerns. The

two women that had concerns had very similar concerns. Both had concerns about the number of breast pumps that were available through The WIC Program. They each stated that there should be more pumps available for WIC participants. One participant stated, “WIC needs more pumps to rent out. I would have liked to have my own pump to keep. Maybe WIC could give mothers coupons for money off buying new pumps.”

## **Chapter 5**

### **Discussion, Conclusions and Recommendations**

#### **A. Introduction**

This chapter includes a discussion about the results of this study and conclusions drawn from this study. It also contains recommendations for The WIC Breast Pump Distribution Program in County A and errors that the researcher made in the execution of the study. This chapter concludes with recommendations for future research.

#### **B. Discussion**

The results of this study are very similar to national studies in regards to the demographic data that was collected. Most of the participants that breastfed infants were Caucasian and were also married. This is shown to be true nationally as well. However, employment status differs from national data. Research has shown that almost two-thirds of women return to work before their child is six months of age (United States Department of Health and Human Services, 2002). In this study, only 55% of women returned to work within six months of giving birth. Almost 41% of the women in this study did not return to work after giving birth.

An interesting finding in this study is that all of the women that breastfed without the use of a breast pump were unemployed. However, among the women

that did use a pump, most were working part-time or full-time. This result may show that it is more difficult to breastfeed while working. A breast pump may make breastfeeding easier for women going back to work or school. A breast pump allows a mother to store her milk for a later use. This may help a mother to keep her milk from drying up and keep a high enough supply to meet her infant's needs. It also allows others such as day care providers, relatives, or babysitters to feed the infant breast milk while the mother is away at work.

Seventy five percent (n=18) of the women using a pump stated that having a breast pump did affect their decision in how long they nursed their infant. Six (25%) said that this did not affect the decision in how long they nursed the infant. This shows that using a pump helped 75% of the women nurse longer than if a pump was not used.

Negative attitudes concerning breastfeeding can be a barrier to the continuation of breastfeeding. However, research has shown that an increasing number of employers in the United States are now supporting pumping at work (Jones 2002). Twenty-five percent of the participants in this study stated that their employer was supportive of them pumping at work. Many of the women in this study chose not to pump at work.

Whether breastfeeding helps a woman lose weight after giving birth is still undetermined. Many studies report that breastfeeding does help a woman lose

weight after giving birth because extra calories are needed while breastfeeding (Jones, 2002). Other studies show that a number of women claim they have not lost weight while breastfeeding (Bilyk, 1996). This study was not any different. There were eleven women in this study that thought that breastfeeding helped them lose weight and eleven women that did not.

Most women in this study did not meet their breastfeeding goals. Although twelve women planned to breastfeed for twelve or more months, only five of the women in this study reached this goal. Seven women planned to nurse for at least six months and only one woman met this goal. This shows that action needs to be taken to help these women meet their breastfeeding goals. The needs and barriers to breastfeeding for women in the WIC Program need to be determined. This would enable others to help the women continue breastfeeding and help them meet their goals.

This study shows that the WIC staff was available to answer questions. All of the participants that had questions received answers from the WIC staff. One participant stated, "I think that this program is great for mothers that need assistance with breastfeeding. The WIC staff was great in assisting me with questions. They helped me a lot with breastfeeding." Another participant stated, "Being able to call WIC when I had questions helped me breastfeed all of my



three children longer.” The WIC staff supports breastfeeding and will help answer any questions that may arise during breastfeeding.

The majority of the mothers in this study were satisfied with The Breast Pump Program. Most of the women responded with positive attitudes toward breastfeeding and The Breast Pump Program. Most agreed that the breast pump was helpful and made life easier. They also agreed that it helped them to breastfeed the baby longer than if they had not had a pump.

The results of this study showed that all of the women who stated that using a breast pump was not easy for them, used a manual pump. Two of those who used a manual pump did not think that the breast pump helped them to breastfeed their infant. These participants were also more likely to respond negatively when asked about their breastfeeding experience. These results may be due to the fact that manual pumps are more difficult to use than electric pumps. This finding supports the fact that the type of breast pump used may be a factor in determining a woman’s breast pumping experience (Dermer 2003).

### **C. Conclusions**

The objectives of this study were met.

**Objective 1:** To evaluate the effect of providing breast pumps to WIC participants on initiation and duration rates through the use of a questionnaire.

**Outcome 1:** Initiation rates were increased with the use of The WIC Breast Pump Distribution Program. This is shown by the following result in this study: nine participants that used a pump stated that knowing that they could get a breast pump did affect their decision to breastfeed. These nine participants may not have chosen to breastfeed if they were not able to obtain a breast pump.

**Outcome 2:** The WIC Breast Pump Distribution Program helped to increase the length of time that women breastfed their infants. The following statements were made by the program participants:

- “I would not have been able to continue breastfeeding and work without the help of the WIC staff and The Breast Pump Program.”
- “I had only planned on nursing my baby for 4-6 months. I may have given up if I hadn't been offered the breast pump from WIC. I am so glad they had that available because I could continue to nurse.”
- “The program helped me to continue breastfeeding while going to work. It wouldn't have been possible otherwise.”

**Objective 2:** To determine the frequency of use of the breast pumps among mothers participating in the WIC Program through the use of a questionnaire.

**Outcome:** Record show that 493 women are currently participating in The County A WIC Program; however, only 24 of these women are involved in the WIC Breast Pump Distribution Program and responded to the questionnaire.

The number of times a mother should pump her milk will depend on the infant's needs. In the beginning, it is recommended that a woman pump eight to twelve times in a 24-hour period emptying the breasts at each pumping (Heck, 2001). This will help the mother keep a milk supply that will meet her infant's needs. From the questionnaire it is shown that most of the participants used the breast pump between one and six times in a 24 hour period. This may be due to the various ages and needs of the infants. With proper pumping, a mother's milk supply will increase as the infant's needs increase. This result could also be due to the amount of formula that was given to the infant. The results show that in most cases, the more formula that was given to the infant, the less breast milk the infant was fed.

In this study, five women stated that they stopped breastfeeding due to milk supply concerns. This may be a result in the number of times they pumped

their milk. Not pumping enough can result in not making enough milk to meet the infant's needs. Also not emptying each breast at every pumping can result in a mother not making enough milk.

#### **D. Recommendations**

##### **1. Advertise The WIC Breast Pump Distribution Program within the WIC Program**

Two out of the three women that did not use a breast pump did not know about The WIC Breast Pump Distribution Program. This may mean that others that do not use the program do not know about the program. A woman who would have fed her baby infant formula may use The WIC Breast Pump Distribution Program and decide to breastfeed her infant if she knows about it. More advertising of this program may increase the number of women that know about the program and may increase the number of women that use the program. Seventy-nine percent of the women that did use the program found out about the program from WIC personnel. The Breast Pump Distribution Program could be advertised with flyers, brochures, or signs in the WIC office. Encouraging any woman that is eligible for this program may also increase the number of women who breastfeed their infant.

## **2. Encouraging WIC Program participants to meet their breastfeeding goals**

Approximately two-thirds of the participants stated that having a breast pump helped them to nurse their infant longer. However, only six of the participants met their nursing goal. Five of those who met their goal planned to nurse for twelve or more months and one planned to nurse for six months. This result shows that these women could use help in meeting their nursing goals. Each woman's needs may differ. Some may need support while others may need tips on how to make breastfeeding easier for them. Helping these women meet their goals would help to increase the duration of breastfeeding thus benefiting the infants, mothers, and society.

## **3. Refer all eligible WIC participants that need a breast pump to MA**

Two women in the study had concerns about the number of breast pumps that were available through the WIC Program. Each stated that there should be more pumps available. The amount of pumps available may be the result of limited WIC funding for pumps. Increased funding of the WIC Program would allow the purchase of a greater number of breast pumps. However, until funding is increased, anyone eligible for Medical Assistance (MA) should be referred to MA by the WIC Program staff members.

#### **4. Show all women with a breast pump how to use the pump**

Only 54% of the participants in this study were shown how to use the breast pump. This may be a barrier in the duration of breastfeeding. Many times not addressing problems with breastfeeding or a breast pump early may lead to the discontinuation of breastfeeding. Even though 46% of the participants were not shown how to use their pump, only four women that used a pump stated that they had problems with their breast pump. Showing all women how to use the pump before they take it home would help to ensure that problems with the pump are not a barrier to the continuation of breastfeeding.

#### **5. Show all women with a breast pump how to clean the pump**

In this study, only half of the women were shown how to clean their pump. It is important for any woman using a breast pump to know how to properly clean the pump. Cleaning the pump properly each time it is used will prevent harmful bacteria from growing in the pump and help to keep the infant from getting ill.

The conclusions drawn from this study and the recommendations made by the researcher can ultimately help the County A WIC Program increase the use of The WIC Breast Pump Distribution Program. It may also help increase the breastfeeding initiation rates and the duration of breastfeeding among WIC Program participants.

### **E. Errors in the Execution of the Study**

There were areas that the researcher could have improved upon when conducting this study. One area of improvement would have been the questionnaire. The questionnaire did not contain a question about the education level of the participants. Research has shown that women with a higher education level are more likely to breastfeed an infant. The researcher could have compared the study result to the national result.

The question how long did you breastfeed your last child should have been changed. This question was not understood among many of the participants. This question may have been better understood if it read how long did you breastfeed your previous child.

Also the organization of the questionnaire could have been improved. Many of the questions had the response, did not use a breast pump. These questions could have been placed together in the questionnaire so that the participants that did not use a pump would not have to answer these questions. This would have made the questionnaire less time consuming for these participants.

Another area of improvement could have been to increase the sample size. Due to the small sample size in this study, the results cannot be generalized to all of the WIC Program participants in The Breast Pump Distribution Program. A

longer period of time should have been allotted for collecting questionnaires.

Also reminder letters could have been sent to the WIC staff each week. A

meeting with the researcher and all WIC staff may have also helped to increase

the number of responses received.

#### **F. Recommendations for future research**

1. Conducting the same study in other counties that have implemented The WIC Breast Pump Distribution Program
2. Organizing a preliminary meeting among the researcher and all WIC staff to explain the research procedures
3. Sending letters to remind WIC staff to give out questionnaires may help to increase the response rate
4. Translating the questionnaire into other languages may provide a more diverse sample population
5. Forming focus groups may provide a better understanding of the study participants



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**Appendix A. Cover Letter To The County A WIC Program Participants**

Dear County A WIC Participant,

My name is Alexis Tuma and I am a graduate student from UW-Stout working with the WIC Program on research for my Master's degree. The purpose of this study is to determine the effectiveness of The WIC Breast Pump Distribution Program. The information obtained from this study will be used to make adjustments to The WIC Breast Pump Distribution Program. This will help improve the efficiency of The WIC Breast Pump Distribution Program for current and future participants and may increase the use of this program.

Thank you so much for your participation in my study. I really appreciate it. If you have any questions, you can direct them to myself, [ransbergera@uwstout.edu](mailto:ransbergera@uwstout.edu) (715-858-0145) or my research advisor, Lydia Chowa, [chowal@uwstout.edu](mailto:chowal@uwstout.edu), (715-232-3285).

Thank you again,

Alexis Tuma

**Appendix B.** The WIC Breast Pump Distribution Program Research Consent Form

I understand that my participation in this study is strictly voluntary and I may discontinue my participation at any time without prejudice. I understand that the purpose of this study is to determine the effectiveness of the WIC Breastpump Program. I further understand that any information about me that is collected during the study will be held in the strictest confidence and will not be part of my permanent record. I understand that at the conclusion of this study all records, which identify individual participants, will be destroyed. The potential risks of this study may include a slight invasion of privacy. Specific questions about your breastfeeding practices will be asked. This information will not be given out to anyone. The WIC staff are the only people that will be asking the participants questions about breastfeeding practices. This consent form will be locked in a safe and will be destroyed after the study is completed. The information obtained from this study will be used to make adjustments to the WIC breastpump program. This will help improve the efficiency of the WIC Breast Pump Distribution Program for current and future participants and may increase the use of this program. This study will help increase the number of women that breastfeed their infants. This has been shown to improve the overall health of the infant and thus decrease the amount of money spent on health care. The money that is not spent on health care can be spent on other important developmental programs will benefit children and infants. Healthier babies mean healthier communities. This means a healthier society and overall a healthier nation.

Note: Questions or concerns about the research study should be addressed to the researcher, Alexis Tuma (715) 858-0145, or to the research advisor, Lydia Chowa (715) 232-3285. Questions about the rights of research study should be addressed to Sue Foxwell, Human Protections Administrator, UW-Stout Institutional Review Board for the Protection of Human Subjects in Research, 11 Harvey Hall, Menomonie, WI 54751, phone (715) 232-1126.

Signature of Client: \_\_\_\_\_ Date: \_\_\_\_\_

**Appendix C. The WIC Breast Pump Distribution Program Evaluation  
Questionnaire**

**Directions:** Place a mark on the blank that best represents your response to each question. This is an anonymous survey. **Please do not put your name on this survey.**

1) Mother's age (in years)

- <sub>1</sub> less than 18
- <sub>2</sub> 18-23
- <sub>3</sub> 24-29
- <sub>4</sub> 30-35
- <sub>5</sub> more than 35

2) Race

- <sub>1</sub> African American
- <sub>2</sub> Hispanic
- <sub>3</sub> Caucasian
- <sub>4</sub> Asian
- <sub>5</sub> Native American
- <sub>6</sub> Other

3) Marital Status

- <sub>1</sub> Single (Never Married)
- <sub>2</sub> Married
- <sub>3</sub> Separated
- <sub>4</sub> Divorced
- <sub>5</sub> Widowed

4) Mother's Height (in feet and inches) \_\_\_\_\_

5) Mother's weight in pounds after stopping breastfeeding or using the breast pump \_\_\_\_\_

6) Employment status while breastfeeding and/or using a pump

- <sub>1</sub> Full-time
- <sub>2</sub> Part-time
- <sub>3</sub> Self-employed
- <sub>4</sub> Unemployed

7) Gender of Infant

- <sub>1</sub> Male
- <sub>2</sub> Female

8) Age of infant (in months) \_\_\_\_\_

9) Current weight of infant (in pounds and ounces) \_\_\_\_\_

10) Infant's weight at birth (in pounds and ounces) \_\_\_\_\_

11) Did knowing you could get a breast pump from WIC/Medical Assistance (MA) affect your decision to start nursing your baby?

- <sub>1</sub> Yes
- <sub>2</sub> No
- <sub>3</sub> I did not know I could get a pump from WIC/MA

12) Where did you find out about getting a pump from WIC/Medical Assistance?

- <sub>1</sub> Physician/Nurse
- <sub>2</sub> WIC personnel
- <sub>3</sub> Family member
- <sub>4</sub> Friend
- <sub>5</sub> Did not use a breast pump
- <sub>6</sub> Other \_\_\_\_\_

13) Did having a breast pump make a difference in how long you nursed your infant?

- <sub>1</sub> Yes
- <sub>2</sub> No
- <sub>3</sub> Did not use breast pump



14) How long did you nurse your baby?

- <sub>1</sub> less than 1 month
- <sub>2</sub> 1 month
- <sub>3</sub> 2 months
- <sub>4</sub> 3 months
- <sub>5</sub> 4 months
- <sub>6</sub> 5 months
- <sub>7</sub> 6 months
- <sub>8</sub> 7 months
- <sub>9</sub> 8 months
- <sub>10</sub> 9 months
- <sub>11</sub> 10 months
- <sub>12</sub> 11 months
- <sub>13</sub> 12 months
- <sub>14</sub> more than 12 months

15) How long had you planned on nursing your baby?

- <sub>1</sub> 1 month
- <sub>2</sub> 2 months
- <sub>3</sub> 3 months
- <sub>4</sub> 4 months
- <sub>5</sub> 5 months
- <sub>6</sub> 6 months
- <sub>7</sub> 7 months
- <sub>8</sub> 8 months
- <sub>9</sub> 9 months
- <sub>10</sub> 10 months
- <sub>11</sub> 11 months
- <sub>12</sub> 12 months
- <sub>13</sub> more than 12 months

16) Why did you stop nursing your baby?

- <sub>1</sub> Sore nipples, engorgement, other discomfort or pain
- <sub>2</sub> Mother's choice
- <sub>3</sub> Wanted to smoke again
- <sub>4</sub> Milk supply concerns
- <sub>5</sub> Lack of support
- <sub>6</sub> Baby's choice
- <sub>7</sub> Went back to work/school
- <sub>8</sub> Contraceptive concerns
- <sub>9</sub> Baby has teeth
- <sub>10</sub> Time to quit/baby is too old to breastfeed
- <sub>11</sub> Other \_\_\_\_\_

17) Did having a breast pump help you meet your nursing goal?

- <sub>1</sub> Yes
- <sub>2</sub> No
- <sub>3</sub> Did not use a pump

18) Did you have any problems with your breast pump?

- <sub>1</sub> Yes
- <sub>2</sub> No
- <sub>3</sub> Did not use a pump

19) If you answered yes to question 18, what type of problem did you have with the breast pump?

20) Why did you request a breast pump

- <sub>1</sub> For occasionally missed feedings
- <sub>2</sub> I returned to work/school
- <sub>3</sub> My baby was born prematurely
- <sub>4</sub> I could not nurse for medical reasons: self/baby
- <sub>5</sub> I was taking medication and was told not to breastfeed
- <sub>6</sub> My baby had difficulty latching on to my breast
- <sub>7</sub> I had a breast infection
- <sub>8</sub> I have flat/inverted nipples
- <sub>9</sub> I had engorgement
- <sub>10</sub> I had sore nipples
- <sub>11</sub> I didn't have enough milk
- <sub>12</sub> I wanted to provide breast milk for my baby, but not nurse my baby
- <sub>13</sub> My milk dried up
- <sub>14</sub> Did not use a pump
- <sub>15</sub> Other (Please explain)\_\_\_\_\_

21) When you used the breast pump, what was the maximum number of times you used the pump in 24 hours?

- <sub>1</sub> 1-2 times
- <sub>2</sub> 3-4 times
- <sub>3</sub> 5-6 times
- <sub>4</sub> 7-8 times
- <sub>5</sub> 9-10 times
- <sub>6</sub> 11-12 times
- <sub>7</sub> more than 12 times
- <sub>8</sub> Did not use breast pump

22) What was the maximum number of times you fed pumped breast milk to your baby.

- <sub>1</sub> 1-2 times
- <sub>2</sub> 3-4 times
- <sub>3</sub> 5-6 times
- <sub>4</sub> 7-8 times
- <sub>5</sub> 9-10 times
- <sub>6</sub> 11-12 times
- <sub>7</sub> more than 12 times
- <sub>8</sub> Did not use breast pump

23) What was the maximum number of ounces or cups of breast milk you fed your baby daily

- <sub>1</sub> 1 ounce
- <sub>2</sub> 2 ounces
- <sub>3</sub> 3 ounces
- <sub>4</sub> 4 ounces
- <sub>5</sub> 5 ounces
- <sub>6</sub> 6 ounces
- <sub>7</sub> 7 ounces
- <sub>8</sub> 8 ounces
- <sub>9</sub> more than 8 ounces
- <sub>10</sub> Don't know

24) When you nursed your baby, how long did your baby nurse at each breast?

- <sub>1</sub> less than 5 minutes
- <sub>2</sub> 5 – 10 minutes
- <sub>3</sub> 11- 15 minutes
- <sub>4</sub> 16 – 20
- <sub>5</sub> more than 20 minutes

25) Have you ever given your baby infant formula?

- <sub>1</sub> Yes
- <sub>2</sub> No

26) How old was the baby when infant formula was given on a regular basis?

- <sub>1</sub> less than 1 month
- <sub>2</sub> 1-2 months
- <sub>3</sub> 3-4 months
- <sub>4</sub> 4-5 months
- <sub>5</sub> 6-7 months
- <sub>6</sub> 8-9 months
- <sub>7</sub> 10-11 months
- <sub>8</sub> 12 months
- <sub>9</sub> more than 12 months
- <sub>10</sub> Never gave infant formula on a regular basis

27) If your baby did take formula with breast milk, what was the average number of ounces of formula your baby drank in 24 hours?

- <sub>1</sub> 1 ounce
- <sub>2</sub> 2 ounces
- <sub>3</sub> 3 ounces
- <sub>4</sub> 4 ounces
- <sub>5</sub> 5 ounces
- <sub>6</sub> 6 ounces
- <sub>7</sub> 7 ounces
- <sub>8</sub> 8 ounces
- <sub>9</sub> more than 8 ounces
- <sub>10</sub> I did not give my baby formula

28) If infant formula was given, what was the reason for giving infant formula?

- <sub>1</sub> For occasionally missed feedings
- <sub>2</sub> I returned to work/school
- <sub>3</sub> I wanted others to be able to feed my baby
- <sub>4</sub> I could not nurse for medical reasons: self/baby
- <sub>5</sub> I was taking medication and was told not to breastfeed
- <sub>6</sub> My baby had difficulty latching on to my breast
- <sub>7</sub> I had a breast infection
- <sub>8</sub> I have flat/inverted nipples
- <sub>9</sub> I had engorgement
- <sub>10</sub> I had sore nipples
- <sub>11</sub> I didn't have enough milk
- <sub>12</sub> My baby was still hungry after breastfeeding
- <sub>13</sub> My milk dried up
- <sub>14</sub> Other (Please explain)\_\_\_\_\_

29) At what age were solid foods introduced to your infant?

- <sub>1</sub> less than 1 month
- <sub>2</sub> 1-2 months
- <sub>3</sub> 3-4 months
- <sub>4</sub> 4-5 months
- <sub>5</sub> 6-7 months
- <sub>6</sub> 8-9 months
- <sub>7</sub> 10-11 months
- <sub>8</sub> 12 months
- <sub>9</sub> more than 12 months
- <sub>10</sub> Have not yet given my infant solid foods

30) If you have returned to work or school, how old was your baby when you returned to work/school?

- <sub>1</sub> less than 1 month
- <sub>2</sub> 1-2 months
- <sub>3</sub> 3-4 months
- <sub>4</sub> 4-5 months
- <sub>5</sub> 6-7 months
- <sub>6</sub> 8-9 months
- <sub>7</sub> 10-11 months
- <sub>8</sub> 12 months
- <sub>9</sub> more than 12 months
- <sub>10</sub> Did not return to work or school

31) Was your employer supportive of your pumping breast milk at work?

- <sub>1</sub> Yes
- <sub>2</sub> No
- <sub>3</sub> Not employed
- <sub>4</sub> Did not choose to pump at work
- <sub>5</sub> Did not use breast pump
- <sub>6</sub> Don't know

32) How many children do you have?

- <sub>1</sub> 1
- <sub>2</sub> 2
- <sub>3</sub> 3
- <sub>4</sub> 4
- <sub>5</sub> more than 4

33) How many children have you been able to breastfeed?

- <sub>1</sub> 1
- <sub>2</sub> 2
- <sub>3</sub> 3
- <sub>4</sub> 4
- <sub>5</sub> more than 4

34) How long did you breastfeed your last child (in months) \_\_\_\_\_

**For questions 35-43, circle the response that best describes how you feel about each statement. If you did not use a breast pump circle N/A for questions 37-41 and 43. N/A means that the statement does not apply to you.**

	Strongly Strongly Disagree				Agree	
35) I enjoy breastfeeding.....	1	2	3	4	5	
Undecided						
36) Breastfeeding is frustrating to me.....	1	2	3	4	5	
Undecided						
37) Using a breast pump can be frustrating...	1	2	3	4	5	N/A
38) Using a breast pump is very helpful.....	1	2	3	4	5	N/A
39) Using the breast pump is easy for me.....	1	2	3	4	5	N/A
40) The breast pump program at WIC made my life easier.....	1	2	3	4	5	N/A
41) The breast pump program helped me breastfeed my infant.....	1	2	3	4	5	N/A
42) I believe breastfeeding helped me lose weight after giving birth.....	1	2	3	4	5	
Undecided						
43) Having the breast pump helped me to breastfeed my baby longer.....	1	2	3	4	5	N/A

**If you did not use a breastpump, skip to question 52**

- 44) If you used a breast pump, what type of pump did you use?
- <sub>1</sub> Double electric rental breast pump (that you need to return after using)
  - <sub>2</sub> Double electric personal use breast pump (that you kept after using)
  - <sub>3</sub> Single manual breast pump
  - <sub>4</sub> Pedal breast pump
  - <sub>5</sub> Other: \_\_\_\_\_



45) Did you obtain a breastpump from WIC?

<sub>1</sub> Yes

<sub>2</sub> No

46) If you did not get the pump from WIC, did WIC refer you to the MA?

<sub>1</sub> Yes

<sub>2</sub> No

<sub>3</sub> I received the pump from WIC

47) If MA did not supply you with a pump where did you get it?

48) Did the WIC staff show you how to use the pump before you took it home?

<sub>1</sub> Yes

<sub>2</sub> No

49) Did the WIC staff show you how to clean the pump before you took it home?

<sub>1</sub> Yes

<sub>2</sub> No

50) Was the staff at WIC available to answer questions about the pump when you had problems?

<sub>1</sub> Yes

<sub>2</sub> No

<sub>3</sub> I did not have any questions

51) Do you have any concerns about breastfeeding, breastpumps, or the WIC Breast Pump Program? If so what are your concerns?

<sub>1</sub> Yes

<sub>2</sub> No

Do you have any concerns:

52) Any other comments:

**Appendix D.** Cover Letter To The Pilot County WIC Program Participants

Dear Pilot County WIC Program Participant,

My name is Alexis Tuma and I am a graduate student from UW-Stout working with the WIC Program on research for my Master's degree. The purpose of this study is to determine the effectiveness of The WIC Breast Pump Distribution Program. The information obtained from this study will be used to make adjustments to The WIC Breast Pump Distribution Program. This will help improve the efficiency of The WIC Breast Pump Distribution Program for current and future participants and may increase the use of this program.

The questionnaire that you receive is part of a pilot study. Filling out the questionnaire will help me prepare the final questionnaire for other WIC participants. Please feel free to make any comments, suggestions for improvement, or make note of any items that you do not understand on the questionnaire. This will help improve the questionnaire and help me receive the information that I need for my study.

Thank you so much for your participation in this study. I really appreciate it. If you have any questions, you can direct them to myself, [ransbergera@uwstout.edu](mailto:ransbergera@uwstout.edu) (715-858-0145) or my research advisor, Lydia Chowa, [chowal@uwstout.edu](mailto:chowal@uwstout.edu), (715-232-3285).

Thank you again,

Alexis Tuma