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# Adolescent Breastfeeding And Illinois Women, Infant, And Children (Wic) Program Participants

Rebecca A. Antonacci

*Eastern Illinois University*

This research is a product of the graduate program in [Family and Consumer Sciences](#) at Eastern Illinois University. [Find out more](#) about the program.

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ADOLESCENT BREASTFEEDING AND ILLINOIS WOMEN,  
INFANT, AND CHILDREN (WIC) PROGRAM PARTICIPANTS

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Adolescent Breastfeeding and  
Illinois Women, Infant, and Children (WIC) Program Participants  
(TITLE)

BY

Rebecca A. Antonacci, R.D., L.D., C.L.C.

1973-

**THESIS**

SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS  
FOR THE DEGREE OF

Master of Science

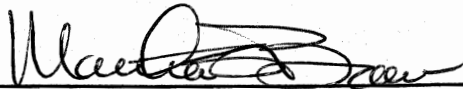
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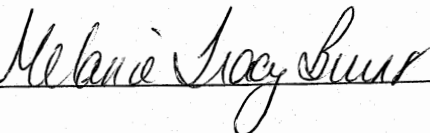
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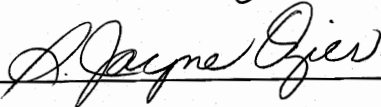
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Running Head: ADOLESCENT BREASTFEEDING IN ILLINOIS

Adolescent Breastfeeding and Illinois Women, Infant, and Children (WIC)

Program Participants

Rebecca Antonacci, R. D., L. D., C. L. C.

## Abstract

### Introduction

Extensive research documents the overwhelming benefits of breastfeeding to infants and mothers. Breastfeeding also provides social and economic benefits (Montgomery & Splett, 1997). One population that is consistently identified in the literature with low breastfeeding rates is adolescent mothers. Breastfeeding education directed towards pregnant, adolescent mothers is especially important (Dye, Wojtowycz, Aubry, Quade, & Kilburn, 1997).

### Purpose of Research

The purpose of this thesis research was to investigate the prenatal breastfeeding attitudes, knowledge, intentions, and breastfeeding practices of adolescent mothers from diverse ethnic populations enrolled in the Illinois WIC program. The relationship of these practices to educational level and plans to return to work and school were identified, and a comparison of adolescents from three community settings were made.

### Methodology

Study data were derived from two different sources. The first data source was a breastfeeding questionnaire that was distributed to WIC agencies throughout Illinois for distribution to pregnant adolescents during the December 2000 calendar month. This information was analyzed according to three community settings that included; rural, urban, and suburban (urban fringe). The second data source was the Illinois WIC Cornerstone database which profiled pregnant mothers enrolled in the Illinois WIC program during the calendar year 2000. Database information obtained

included the total number of pregnant women enrolled in WIC, total number of pregnant adolescents, and the breakdown of this data for each WIC agency.

### Results

One hundred seventy-one participants completed breastfeeding questionnaires. The average age of participants completing the questionnaire was 16.6 years. The respondents were 58% white, 25% black, 0.15% Hispanic, 0.01% American Indian, Eskimo, Aleut, and 0.006% other. Hispanic adolescents had a proportionately higher intention to breastfeed when compared to Blacks and Whites ( $p < 0.05$ ). Questionnaire data suggested that WIC adolescents were knowledgeable about breastfeeding, but factors affecting their attitudes interfered with their breastfeeding intention.

A total of 5,675 adolescents from 70,423 pregnant mothers were included in the Illinois WIC Cornerstone database. Twenty-three percent of these adolescents initiated breastfeeding. Sixty-five percent never attempted breastfeeding, and the remaining 12% continued to breastfeed at the end of 2000. Breastfeeding duration for the majority of the sample of breastfeeding was 1 to 3 months. Rural adolescents had the highest breastfeeding initiation rate (50.7%) and the lowest percentage of adolescents still breastfeeding at the end of the 2000 calendar year. Suburban adolescents had the highest number of adolescents still breastfeeding at the end of 2000 (21.3%). Suburban and urban breastfeeding initiation rates were similar to the national average of 20-30%.

## Conclusion

There were five main conclusions from this research. The first conclusion was that low breastfeeding initiation and duration rates existed in this Illinois adolescent WIC population when compared to the Healthy People 2010 breastfeeding goals. Second, little difference was observed in knowledge and attitude with regards to ethnicity. However, Hispanic adolescents had a proportionately higher intention to breastfeed when compared to Blacks and Whites. Next, differences in breastfeeding rates do exist among the rural, suburban, and urban community settings. Fourth, a statistically significant difference was not observed when comparing the three community settings and the attitudes, knowledge, and intention of the adolescent WIC mothers. The final conclusion of the study was that no relationships among educational level, plans to return to work and/or school, and adolescent breastfeeding intention in the rural, urban, and urbanized area community settings were observed.



Dedication

I want to dedicate the completion of this thesis to my wonderful husband, Joel. His constant love and support were instrumental in its completion.

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I want to thank Drs. Martha Brown, Melanie Burns, and Jayne Ozier for their expertise and assistance in the completion of this project. I would also like to express my gratitude to Penny Roth, Illinois Director of Nutrition Services, and Brenda Synder, Illinois Breastfeeding Coordinator for their assistance in obtaining approval and data for completion of this study.

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## Chapter 1

### Introduction

Extensive research documents the overwhelming benefits of breastfeeding to infants and mothers. Human milk and breastfeeding can improve general health, development, and growth of infants. In addition to these health benefits, breastfeeding provides social and psychological as well as economic benefits.

Research indicates that adolescents in minority groups have consistently had lower rates of breastfeeding initiation and continuation until 6 months. In addition, women who were Black, younger, only high school educated, and WIC participants had lower overall breastfeeding rates. Follow up studies indicated that the breastfeeding rates of these groups were improving, however increased promotion of breastfeeding research and education was still warranted.

Additional insight into adolescent breastfeeding practices is provided by research that investigated the attitudes, knowledge, and intentions of this population regarding breastfeeding. When evaluating an adolescent's intention to breastfeed, researchers have utilized the Theory of Planned Behavior (TPB). The theory states that a person's behavior is a function of their intent to perform or not perform a behavior. This theory is well matched to adolescent breastfeeding because there are many maternal and infant variables that influence the intention and decision of a mother to breastfeed. Larger studies regarding adolescent breastfeeding behaviors have been conducted in the Western states. The resulting study populations have been primarily of Hispanic origin. Despite the availability of these studies, there is a lack of research regarding the breastfeeding behaviors of African-American and

Caucasian adolescents in the Midwest region of the country and the relationship to school and work plans to the breastfeeding attitude and knowledge of this population. Previous research also lacks a comparison of different community settings and the relationship to breastfeeding rates. This study was designed to evaluate the breastfeeding practices of adolescents participating in the Illinois WIC program in conjunction with community setting.

#### Purpose of Research

The purpose of this thesis research was to investigate the prenatal breastfeeding attitudes, knowledge, intentions, and breastfeeding practices of adolescent mothers from diverse ethnic populations in the Illinois WIC program and to compare adolescents from three community settings. The relationship of these practices to educational level and plans to return to work and school were analyzed. To this date, there is a lack of breastfeeding information about the WIC adolescent in Illinois.

It was hypothesized that there would be a difference in breastfeeding attitudes, knowledge, and behavior among ethnic populations and among community settings. It was expected that exposure to breastfeeding models and information would be limited among this adolescent population, and that differences would exist according to community setting. Prior to interventions aimed at increasing the breastfeeding rate in the Illinois adolescent WIC population, a needs assessment would be required. Results of this study would provide important needs assessment information.

### Research Questions

Five research questions were identified for this study:

1. What is the duration of breastfeeding practices of adolescent mothers participating in the Illinois WIC program?
2. To what extent does ethnicity influence prenatal breastfeeding attitudes, knowledge, and intentions of adolescent mothers participating in the Illinois WIC program?
3. To what extent do adolescent breastfeeding rates of adolescent mothers participating in the Illinois WIC program differ among rural, urban, and urbanized area community settings?
4. To what extent do prenatal breastfeeding attitudes, knowledge, and intention of adolescent mothers participating in the Illinois WIC program vary among the rural, urban, and urbanized area community settings?
5. What is the relationship between plans to return to work and/or school, and adolescent breastfeeding intention in the rural, urban, and urbanized area community settings?

### Definition of Terms

For the purpose of this research, the terms referred to in this study were defined as follows:

1. Adolescent mother: a mother age 17 years or less at the time of conception. (Illinois Department of Human Services, 2000, p. 41).
2. Pregnant adolescent: a pregnant female less than 17 years old. (Illinois Department of Human Services, 2000, p. 41).



3. Breastfeeding: to feed an infant human milk from its mother's breast during infancy and early childhood, either exclusively or partially (Institute of Medicine [IOM], 1990, p.24).
4. Exclusive breastfeeding: to feed only an infant only breastmilk and developmentally appropriate food items (IOM, 1990, p.24).
5. Partial breastfeeding: when breastfeeding is supplemented with limited amounts of formula, juice, water, or solid foods (IOM, 1990, p.24).
6. Minimal breastfeeding: when an infant receives nearly all sustenance from formula and other foods, not breastmilk (IOM, 1990, p.25).
7. Primigravida: a women during her first pregnancy (IOM, 1990, p.446).
8. Primipara: a woman who has produced one infant after 20 weeks of gestation, regardless of viability (IOM, 1990, p.446).
9. Incorporated place: A type of governmental unit incorporated under state law as a city, town, borough, or village having legally prescribed limits, powers, and functions (United States Census, 1990).
10. Rural place: any incorporated place having fewer than 2500 residents in the most recent census (United States Census, 1990).
11. Urban place: any incorporated place having greater than 2500 residents in the most recent census (United States Census, 1990).
12. Urban fringe: the closely settled territory adjacent to the place(s) of an urbanized area (United States Census, 1990).

13. Central place: the core incorporated place(s) of an urbanized area, usually consisting of the most populous place in the urbanized area. (United States Census, 1990).

14. Adjacent: a term descriptive of geographic entities that are next to each other and share all or a portion of a common boundary (United States Census, 1990).

15. Urbanized area (Suburban): an area consisting of a central place(s) and adjacent urban fringe that together have a minimal population of at least 50,000 people and an overall population density of 1,000 people per square mile (United States Census, 1990).

## Chapter 2

Review of Literature

In order to support this research plan, this review of literature investigated the various benefits of human milk, current breastfeeding education, breastfeeding trends in the United States, the Healthy People 2010 national health promotion program, adolescent pregnancy and subsequent birth rates, breastfeeding practices of the adolescent mother, and the Theory of Planned Behavior. Limitations from previous research were identified in order to prove the necessity of the proposed study.

Benefits of Human Milk

Human milk is a species-specific form of nutrition. It possesses the nutrients that human infants need to grow and develop (Worthington-Roberts & Williams, 1997, chap. 12). Multiple benefits of breastfeeding have been identified in the literature. First, the consumption of breastmilk by the infant is associated with lower rates of illnesses such as respiratory infections, ear infections, diarrhea, and other systemic infections (Gartner et al., 1997). These reduced incidences of infection are attributed to immunologic benefits that breastfeeding provides as well as the hygienic mode of feeding that it promotes. Breastfeeding may be the most hygienic mode of feeding in areas that have poor sanitation (Wright, Bauer, Naylor, Sutcliffe, & Clark, 1998).

Second, breastfeeding has also been reported to decrease the occurrence of diseases such as Crohn's disease, type 1 diabetes, and lymphoma. The protective mechanism breastfeeding may provide for this array of chronic diseases does

require further study, but preliminary findings are encouraging (Story & Stang, 2000; Worthington-Roberts & Williams, 1997). Obesity is another significant health problem linked to breastfeeding. Researchers have associated breastfeeding with a lower risk of being overweight during older childhood and adolescence. The implications of one study (Gillman et al., 2001) suggest that the promotion of breastfeeding could ease the rising prevalence of obesity worldwide.

In addition to these health benefits, breastfeeding also presents an economic benefit to the United States. In a study by Montgomery and Splett (1997), breastfeeding an infant enrolled in the Woman, Infant, and Children program (WIC) resulted in significant monetary savings. The study reported savings of \$478 in WIC and Medicaid costs during the first six months of the infant's life. The magnitude of these figures is illustrated by considering that approximately 300,000 women in the WIC program are breastfeeding each month (United States Department of Agriculture, 2000).

Additionally, Ball and Wright (1999) found a significant reduction in office visits, hospitalization, and prescription costs during the first year of life in infants who were breastfed during the first three months of life. Infants who were never breastfed had 2,033 more office visits, 212 additional hospital days, and 609 more prescriptions per 1,000 infants when compared to those infants breastfed for at least 3 months. Breastfeeding resulted in cost-savings to the health care system of approximately \$331 to \$475 per infant breastfed.

### Breastfeeding Education

Due to these various benefits, breastfeeding education and promotion programs are very common in the field of public health. Hartley and O'Conner (1996) utilized a multi-disciplinary breastfeeding education program through a women's health clinic to promote breastfeeding. To implement the program, educational training sessions were conducted for all health clinic staff members. A breastfeeding education checklist was then placed in each clinic patient's chart, and the education topics on the checklist were covered throughout the course of the patient's prenatal visits. Results indicated an increase in the breastfeeding initiation rate from 15% to 31% through these interventions. The study's success stressed the importance of participation by the entire health care team in a breastfeeding education program for a women's health clinic.

Using an another approach to breastfeeding education, Kaplowitz and Olson (1983) documented no increase in the incidence or duration of breastfeeding practice in the sample of low-income women. The researchers mailed educational pamphlets weekly to study participants over a five- week period. The pamphlet was successful in increasing the breastfeeding knowledge of participants that were undecided or originally intending to bottle-feed. However, this education method failed to increase breastfeeding initiation or duration in this sample. Also, no change in breastfeeding initiation or duration was observed in those participants intending to breastfeed prior to the study. Attitudes of participants failed to be affected by the pamphlet distribution. The study emphasizes the complex relationship between the breastfeeding attitudes, knowledge, intention, and practice of pregnant women.

Other documented methods of breastfeeding education include the classroom-based method and individualized breastfeeding counseling. Kristen, Benton, Rao, and Sullivan (1990) utilized a combination of these methods to study the effects they would have on a sample of low-income African-American women. Education included maternal and infant benefits, possible problems, and myths associated with breastfeeding. The study found that women who received either form of breastfeeding education were more likely to initiate breastfeeding when compared to women who received no intervention (45% vs. 23%). However, breastfeeding duration was not affected by these interventions. Both methods of education were effective to increase breastfeeding initiation for this sample of low-income African-American women.

To evoke partner-support for breastfeeding, Sciacca, Phillips, Dube, and Ratliff (1995) utilized a classroom-method for mothers enrolled in WIC. Classes conducted with partners discussed the concerns and questions of participants regarding breastfeeding. This approach was combined with a separate education class series for mothers and a breast pump rental program. Initiation was increased 17%, and breastfeeding rates at 3 months postpartum were increased by 25% using this design. Results of this study advocate breastfeeding education for both the pregnant mother and her partner.

The previously mentioned studies documented the benefits of breastfeeding education. Various methods have been used to increase breastfeeding initiation and duration with pregnant mothers. In addition to valuable education methods, these approaches also present ideas for future improvements in the breastfeeding

education process. Pregnant mothers should be allowed to make informed decisions regarding infant feeding. Active breastfeeding education and management is the key to successful breastfeeding promotion (Krebs & Murtaugh, 1997).

### Breastfeeding Trends in the United States

In the United States, the most comprehensive data on breastfeeding rates originates from a survey conducted by the Ross Products Division of Abbott Laboratories. This study originated in 1955, and it remains the largest national survey regarding infant feeding choices to date. The study utilized a list of live births in the United States that represents approximately 75% of births. At six months postpartum, mothers were mailed surveys that requested information regarding demographics as well as feeding practices after birth, in the hospital, and during the first six months of life. The two most recent surveys were conducted in 1989 and 1995 (Ryan, 1997).

The 1989 Ross survey included 89,640 mothers and revealed an overall two and a half -fold increase in breastfeeding initiation from 1971 to 1982. During this period a five-fold increase in the breastfeeding rate at 6 months postpartum was also observed. From 1984 through 1989 results showed a sharp 13% decrease for breastfeeding initiation and a decline in 6-month breastfeeding rates. The likelihood of initiating breastfeeding was increased by college education, Caucasian ethnicity, increased maternal age, and normal infant birth weight. Breastfeeding at 6 months of age was most common among women who were older, multiparous, non-WIC participants, homemakers, and lived in Western states. (Ryan, Rush, Krieger, & Lewandowski, 1991).

The most recent survey results have revealed increases in breastfeeding initiation as well as continued breastfeeding at six months of age. In 1995, Ross mailed 720,000 questionnaires to a representative sample of mothers when their infants were six months old. This survey resulted in a 50%  $\pm$  5% response rate. These data were analyzed to obtain the 1995 Ross Laboratories Mothers' Survey results. The survey illustrated breastfeeding initiation rates in 1995 were 59.7%, which was a 14% increase from 1989. The largest increases in breastfeeding initiation from 1989 through 1995 were seen in women who were African-American, less than 25 years old, low income, primiparous, and WIC participants. The increase of breastfeeding in these groups is encouraging, but these groups are still the least likely to breastfeed their infants. The 1995 Ross Mother's Survey revealed the 6-month breastfeeding rate was also increased by 19.3% when compared to the previous results. This 6 months breastfeeding rate continued to be increased in women who were older, multiparous, non-WIC participants, homemakers, and lived in Western states (Ryan, 1997).

#### Healthy People 2010 National Health Promotion Program

The previous survey results indicate the specific need for further breastfeeding education efforts. To aid in this effort, the United States has developed national health standards that include goals for breastfeeding. The Healthy People 2010 national health goals are part of a national health promotion program active in the United States. These goals are initiated by federal, state, and community agencies for the improvement of health in the United States (Marwick, 2000).



A large portion of these health goals is the promotion of maternal-child health. Included in this area is the promotion of breastfeeding. The consortium promotes breastfeeding as a strong support for infant health in the United States. As shown in Table 1, the Healthy People 2010 breastfeeding goals are to have 75% of women initiate breastfeeding in the early postpartum period, 50% of women breastfeeding at 6 months postpartum, and 25% of women breastfeeding at 1 year postpartum. The current 2010 (Table 1) goals are intended to increase the breastfeeding rates for all races of women in efforts to improve overall infant and maternal health outcomes (Healthy People 2010, 2000b).

Table 1

Healthy People 2010 breastfeeding goals

Year	Early Postpartum Period	6 months	1 year
1998	64%	29%	16%
2010 Goal	75%	50%	25%

(Healthy People 2010, 2000b)

Another maternal-child health topic included in the Healthy People 2010 goals is adolescent pregnancy. The consortium reported a 1996 baseline adolescent pregnancy rate of 68 pregnancies per 1,000 females aged 15 to 17 years. The current 2010 goal is set at 43 pregnancies per 1,000 females aged 15 to 17 years. This goal was designed to improve the overall potential of the nation's youth and the growth and development of newborns (Healthy People 2010, 2000a).

Adolescent Pregnancy and Birth Rates in the United States and Illinois

Due to these Healthy People 2010 public health goals, adolescent pregnancy is an area of particular interest to researchers. According to Moore, (as cited in

Felice et al., 1999) prevention of unintended, adolescent pregnancy has been a primary focus of the nation's health professionals for years. Historically speaking, adolescent pregnancy rates were the highest during the 1950s through the 1960s. The legalization of abortion in 1973 and improved contraception methods during the 1970s and 1980s likely contributed to a decrease until 1986. Following this, increases were observed in the rate of adolescent pregnancy until 1992 (Felice et al., 1999). Recent reports indicated that adolescent birth rates have declined from 62.1 births per 1,000 women to a rate of 49.6 births per 1,000 women United States (United States Department of Health and Human Services & Center for Disease Control, 2000). This is the lowest recorded rate for women ages 15-19 and a 20% decrease from the most recent high in 1991 (Curtin & Martin, 2000).

Data from the state of Illinois also reflected this trend of decreased adolescent pregnancy. Reports from 1999 (Ventura, Matthews, & Curtin) revealed that the state teenage birth rate declined 13.0-15.9 percent from 1991 to 1997. Despite this encouraging data, one half million teenage girls in the United States become pregnant each year, and over 90% of these pregnancies are unintended. Data substantiate that approximately half of these pregnancies result in live birth, and the remaining half end in miscarriage or abortion (Story & Stang, 2000; Ventura, Matthews, & Curtin, 1999; Wahl, 1999).

Studies have attributed poor adolescent pregnancy outcomes to a combination of physical and social factors. These poor outcomes include low infant birthweight, preterm labor, small for gestational age infants, and large for gestational age infants (Lao & Ho, 1998). Physical factors associated with poor outcomes

include low maternal weight and height, poor weight gain, and increased parity (Fraser, Brockert & Ward, 1995; Goldenberg & Klerman, 1995). In addition, the results of these risks from physical immaturity include increased neonatal and postneonatal mortality (Olausson, Cnattingius, & Haglund, 1999).

Many pregnant adolescents also may come from a low socioeconomic status and receive poor prenatal care (Fraser, Brockert, & Ward, 1995). In addition, physical abuse may also be a factor. A 1999 study revealed that 22% of the sample (n=30) experienced physical abuse during their pregnancies. The children born to these adolescents had significantly lower birth weight than those who were not abused. This factor was associated with lack of family support, household size, and poor prenatal care. The abused adolescents also had a history of miscarriages, substance abuse, and increased medical problems during their pregnancies (Renker, 1999).

Adolescent pregnancy is an issue that can be evaluated from several aspects. First, prevention of secondary pregnancy is a primary goal. Secondly, developing a health care system that promotes the improvement of maternal and infant health is essential. Previous research has proven the efficacy of psychosocial and nutritional support to promote successful adolescent pregnancy outcomes (Casanueva, Marin, Gelis, Diaz-Barriga & Legarreta, 1997). Part of this successful and supportive health care system previously mentioned is adequate support for breastfeeding among adolescent mothers (Rees & Worthington-Roberts, 1994).

### Breastfeeding Practices of the Adolescent Mother

Many factors contribute to the breastfeeding attitudes and practices of adolescent mothers. There have been many attempts to explain the attitudes of the adolescent concerning breastfeeding. First, the father's influence may be significant in determining the choice of a young mother. Many young fathers may have difficulty with the sexual aspects of their partner's breasts if she breastfeeds (Christopher, 1987). The influence of the mother's perception of the father's feelings about breastfeeding has been established in research. A study by Arora, McJunkin, Wehrer, and Kuhn (2000) documented the mother's perception of the father's preference was a primary reason for choosing bottle-feeding over breastfeeding.

Second, adolescent girls may also have issues with their own body image and self-confidence that cause difficulty for them with breastfeeding (Hudson & Ineichen, 1991). A study conducted by Ineichen, Pierce, and Lawrenson (1997) investigated adolescent mothers and breastfeeding. Two deterrents to breastfeeding cited by the non-breastfeeders were embarrassment and having to "do it all yourself" (p. 507). This study supported the concept that body image issues and self-confidence played a role in the adolescent's decisions to breastfeed.

Third, peer and family influence may also be especially important to adolescent mothers in their decision to breastfeed. This exposure to breastfeeding has been shown to affect breastfeeding initiation in adolescents. Research has documented the effect of peer-group feeding choices on an adolescent mother's breastfeeding choice (White, Freeth, & O'Brien, 1993). An additional study documents that adolescents who had heard about breastfeeding at home or who

were themselves breastfed had more positive attitudes towards breastfeeding (Baisch, Fox, & Goldberg, 1989).

Fourth, functional barriers for adolescents may include employment, school attendance, and lack of breast pump availability and pump room space in the school setting (Story & Stang, 2000). A study by Avery et al. (1998) found early weaning problematic in primiparas who were younger, unmarried, less educated, and working or attending school. Possible reasons for this early weaning problem in primiparas working or attending school may be the lack of a breast pump and pump room space in these settings.

Fifth, breastfeeding may restrict some activities such as smoking, taking contraception, and social activities. Yoos (1985) reported that adolescents who chose bottle-feeding perceived breastfeeding as an interference with smoking and taking contraceptive pills. This study supports the notion that social issues impact the infant feeding decisions of adolescents.

Lastly, many adolescents have a deficit in knowledge about breastfeeding. This deficit has been shown in research to be a significant barrier when addressing adolescent breastfeeding behaviors. Baisch et al. (1989) reported that their sample of pregnant adolescents (51%, n=128) felt they did not have enough knowledge about breastfeeding. Additionally, lack of breastfeeding knowledge was associated with decreased breastfeeding practice in this sample of pregnant adolescents.

Attitudes about breastfeeding form well before pregnancy. Pascoe (1982) evaluated the attitudes and knowledge of 571 high school girls. The results showed that adolescents who were informed about breastfeeding were more likely to want to

breastfeed their infants in the future. However, there were several misconceptions about breastfeeding among adolescents (Ellis, 1983). Misconceptions included: breastfeeding was an instinctual behavior and breastfeeding success was linked to breast size. A serious misconception found was that breastfeeding practice was a sign of lower socioeconomic status. The results of this study indicated the need for comprehensive breastfeeding education programs throughout a child's education with breastfeeding discussions beginning in childhood (Ellis, 1983).

In support of Ellis' findings, Cusson (1985) established that adolescents were affected by the social context in which breastfeeding is viewed. Early exposures to breastfeeding influenced a positive view of breastfeeding. Those who were breastfed or had siblings who were also breastfed had more positive views of breastfeeding. This study further emphasizes the need for breastfeeding exposure and education throughout the education experience.

Maehr, Lizarraga, Wingard, and Felice (1993) compared adolescent and adult mothers that intended on breastfeeding. This study contributed to the awareness of adolescent mothers and breastfeeding behavior. The researchers used a sample of 48 adolescent mothers and 48 adult mothers. Each contained 40 Hispanic (83%), 5 (10%) Caucasian, 2 African-American (0.04%), and 1 Asian (0.02%) women. Study interviews were conducted at a university-based hospital within 48 hours postpartum. The study results showed that 48% of the adults and 27% of the teens made their decisions to breastfeed before pregnancy. Adolescent mothers were found to choose breastfeeding during or after pregnancy most often. Once again,

exposure to breastfeeding was found to be an indicator of early decision to breastfeed.

Income status of adolescent mothers may be lower than comparison groups. A 1990 study confirmed that women who have annual gross income less than \$15,000 have a lower incidence of breastfeeding their infants. This may be due to limited resources for breastfeeding education (Grossman et al. 1990). Prenatal breastfeeding education programs have proven successful with this target population of low-income women. These programs have shown to increase breastfeeding rates from 32% up to 61% in the research setting (Brent, Redd, Dworetz, D'Amico, & Greenberg, 1995).

Another factor influencing breastfeeding practices of adolescent mothers may be related to the fact that 90% of adolescent pregnancies are unintended (Wahl, 1999). Research data has shown that unintended pregnancy is associated with a lower likelihood of breastfeeding (Swigonski, Skinner, & Wolinsky, 1995). However, the benefits of breastfeeding are especially important in this instance. First, breastfeeding may provide health protection to this at-risk infant population. Second, breastfeeding may help stimulate mother-infant bonding. This bonding may allow the mother-infant relationship to overcome the difficulties associated with unintended, adolescent pregnancy. Results from a 1997 study confirmed these findings. Women who had planned pregnancies breastfed their infants at a rate of 52% compared with a rate of 44% for women who had unplanned pregnancies. These data supported the association between lower breastfeeding rates among unintended pregnancies (Dye et al., 1997). However, it is also important to note the key influence that health

care team members play in developing positive attitudes about breastfeeding among adolescent mothers. Education and exposure to breastfeeding in the health care setting is essential to this process (Baisch, Fox, & Goldberg, 1989).

Adolescent breastfeeding practices have also been evaluated on a basis of ethnicity. Several studies have been conducted using Black, White, and Hispanic adolescents as the subjects. Results of a 1992 study (Lizarraga, et al., 1992) showed that a total 72% of adolescents in the sample intended on breastfeeding their infants, and 58% of these had initiated breastfeeding at 48 hours postpartum. These percentages were higher than the national average of 30.2% at the time of that study. Of the 64 adolescents included in the study 67% (n=43) were Hispanic, 14% were Black (n=9), 11% were White (n=11). And 8% (n=5) were Asian. One explanation for the results of this study may be that Hispanic adolescents had more role models for breastfeeding and were more likely to be breastfed themselves.

An additional study investigating ethnicity's influence on breastfeed practice found similar results. Of the almost 200 (n=199) adolescents in a study conducted by Felice, Shragg, James, and Hollingsworth (1987), 40% were White (n=76), 38% were Hispanic (n=76), and 22% were Black (n=44). This study also found that Hispanic adolescents were the most likely to breastfeed their infants. They relied on the advice of others in infant feeding choice and had more breastfeeding role models.

In contrast, research has shown African-American adolescents (n=131, 9.2%) breastfeed their infants about 15% of the time. This was compared to a rate of 55% for Hispanics (n=62, 23%), and 45% for Caucasians (n=145, 43.5%). African-



Americans were found to have limited role models and education regarding breastfeeding (Wiemann, DuBois, & Berenson, 1998a). Other studies have further confirmed these findings that breastfeeding rates vary among different ethnicities (Rassin et al. 1984).

Qualitative research conducted by Hannon, Willis, Bishop-Townsend, Martinez, and Scrimshaw (2000) identified three major influences on the decision of African-American and Hispanic mothers to breastfeed. These included "a) their perception of the benefits of breastfeeding, b) their perceptions of the problems with breastfeeding, and c) influential people" (399). In this minority population, the decision was an ongoing, dynamic process. This research stresses the importance of ongoing breastfeeding education throughout adolescent pregnancy.

#### The Theory of Planned Behavior

The Theory of Planned Behavior (TPB) is one theory that can be utilized to predict behaviors such as breastfeeding (Wambach, 1997). Developed as an extension of the Theory of Reasoned Action by Fishbein and Ajzen, the TPB states that a person's behaviors are a function of their intent to perform or not to perform the behavior. Factors that may influence a person's intention include attitude, perceived social norm (subjective norm), and perceived control over performing or not performing the behavior (volitional control). Outcome beliefs and evaluation of outcomes contribute to a person's attitude, and motivation to comply and beliefs about others contribute to the social norm. When combined with a person's perceived behavioral control (volitional control), all of these factors influence

behavioral intention. This, in turn affects the performance of a behavior (Ajzen, 1988; Ajzen & Madden, 1986).

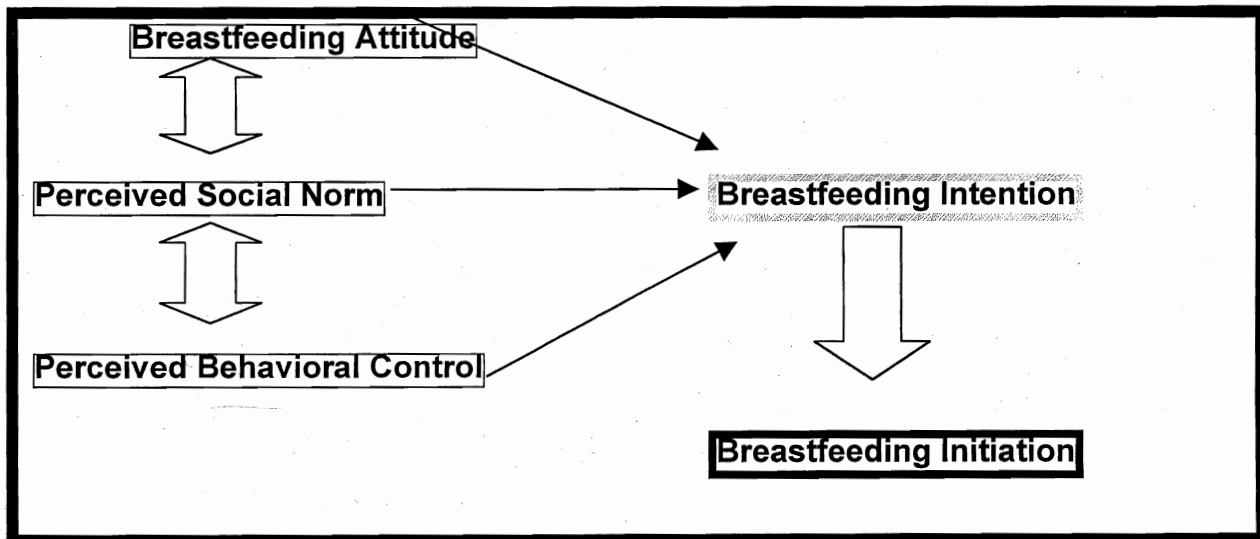
A meta-analysis for the application of the theory of planned behavior to health-related behaviors found that the theory explains intention well. The analysis also found that attitude and perceived behavioral control seem to be more important to intention than social influence (Godin & Kok, 1996). The TPB has been linked to many health-related behaviors. Breastfeeding is a behavior well matched to this theory because there are many maternal and infant variables that influence the decision to breastfeed (Wambach, 1997).

Several previous studies have utilized the TPB in the evaluation of the breastfeeding model (Avery et al., 1998; and Duckett et al., 1998; Wambach, 1997). A study conducted by Wambach in 1997 partly supported the use of the TPB in the prediction of breastfeeding intentions and behavior. A sample of 274 women was recruited and surveyed during the prenatal and postpartum period. The survey results identified prenatal breastfeeding attitudes were the primary predictor of prenatal attitudes but perceived social norm was not a major predictor (Figure 1).

A second study conducted by Avery et al. (1998) also utilized the Theory of Planned Behavior to attempt further understanding of breastfeeding behavior. Complete data was obtained from 602 mothers immediately postpartum and at 1, 2, 6, 9, and 12-month intervals. In this study, breastfeeding intention did not fully explain the relationship between attitude and behavior. There was some variability when other factors were considered. Early weaning was a primary problem identified. Researchers modified the TPB to include breastfeeding variables such as

childcare, early breastfeeding problems, and postpartum employment plans. They found this model useful in predicting early weaning behaviors among primiparas.

The third, most recent study utilizing the TPB in understanding breastfeeding obtained complete data from 602 mothers over the course of their breastfeeding experience. The prospective, longitudinal study found the TPB useful in explaining differences in breastfeeding duration for this sample. The researchers stressed the importance of the theory in understanding the stimulus for individuals to breastfeed (Duckett et al, 1998).



(Wambach, 1997; Avery et al., 1998; and Duckett et al., 1998)

Figure 1. Breastfeeding intention and initiation model utilizing the Theory of Planned Behavior

For the purpose of this proposed study, the variables from the Theory of Planned Behavior were defined as follows (Wambach, 1997):

1. Intention: a mother's intention to breastfeed.
2. Attitudes: a mother's positive or negative attitude towards breastfeeding.

3. Beliefs about Outcomes: a mother's beliefs about the potential benefits about breastfeeding for her and her infant.

4. Perceived Social Norm (Subjective Norm): A mother's assessment of how others think she should feed her baby (breast vs. bottle).

5. Perceived Behavioral Control: A mother's belief in herself about whether or not she could successfully initiate and maintain breastfeeding for her infant.

### Summary

In summary, the previously mentioned studies have documented the health and economic benefits of breastfeeding. Breastfeeding may provide additional health benefits for adolescent mothers and their children. Despite this, research has shown that adolescent mothers have lower breastfeeding rates when compared to adult mothers. Several studies indicated ethnicity might also affect breastfeeding decisions by limiting breastfeeding role models and education. The highest breastfeeding rates were observed among Hispanic adolescents, and the lowest rates were observed among African-American adolescents. The Theory of Planned Behavior is one theory that can be applied to predict adolescent breastfeeding behaviors.

Although research regarding adolescents and breastfeeding exists, these existing studies have limitations. First, most research has been conducted in Western states where breastfeeding rates tend to be higher. These studies also utilized a varied demographic population. While useful to health professionals, there is a lack of information using adolescents from the Midwest states. The proposed population would likely vary from the population in the Western states. Second, the

previous research also did not define differences among adolescents in rural, urban, and urbanized area (suburban) community settings. Third, the previous research also did not clearly define the interrelationship among educational level, plans to return to work and/or school after pregnancy, and subsequent breastfeeding intention. Fourth, there is no present data on the adolescent breastfeeding rates of the Illinois WIC population. The proposed study addressed all of these previously lacking variables and provided new information about adolescents and breastfeeding attitudes, knowledge, intentions, and breastfeeding practices in the Illinois WIC population.

## Chapter 3

MethodologyPopulation and Sample

These study data were derived from two different sources. The first data source was a breastfeeding questionnaire that was distributed to WIC agencies throughout Illinois for distribution to pregnant adolescents during the December 2000 calendar month. The second data source was the Illinois WIC Cornerstone database which included pregnant WIC mothers enrolled in the Illinois WIC program during the calendar year 2000.

Breastfeeding questionnaire. Data were gathered from a breastfeeding questionnaire distributed to WIC agencies throughout Illinois for distribution to pregnant adolescents. In order to determine the agencies chosen to distribute the breastfeeding questionnaire, several steps were taken. First, all of the WIC agencies in the state of Illinois were separated into the community settings of suburban, urban, or rural. Second, WIC agencies were randomly chosen utilizing a Table of Random Numbers (Patten, 2000) from each community setting group to participate in the study. Third, the researcher then telephoned the chosen WIC agencies to request their participation. Next, questionnaires were mailed to each agency that agreed to participate along with a cover letter (Appendix A) from the researcher and a study fact sheet (Appendix B). Finally, the completed questionnaires (Appendices C and D) were returned to the researcher by mail resulting in a convenience sample of participants from the three community settings. Illinois WIC agencies from suburban Chicago

(suburban), central Illinois (urban), and rural Illinois represented the three community settings previously described for the purpose of the study.

Illinois WIC Cornerstone database. The Illinois WIC Cornerstone database was a retrospective database which profiled all of the pregnant mothers enrolled in the Illinois WIC program during the year 2000. The computer disk containing this previously existing information was obtained from the Director of Nutrition Services for the Illinois State Department of Human Services. The entire population of adolescents (age  $\leq 17$  years) from the 2000 calendar year was included in this analysis. No personal identifiers were used in this WIC computer database.

#### Data Collection Instruments

Breastfeeding questionnaire. The questionnaire instrument was a 35-question, forced choice questionnaire (see Appendices C and D) adapted from a Berger and Winter Questionnaire (1980). Part one had ten questions documenting age, race, education level, school and work plans, personal feeding information for the pregnant mother and/or significant other, and pregnancy intention. Part two of the questionnaire contained twenty-five questions regarding breastfeeding knowledge, attitude, and intention. All questions in part two were yes/no responses or nominal level data. Items were both positive ("breastfeeding is convenient for the mother") and negative ("breastfeeding disturbs family life") (Baisch et al., 1989). Of the 25 items, numbers 4, 5, 6, 7, 10, 12, 13, 14, 15, 16, 21, and 22, were reversed for scoring purposes. All of these previously mentioned questionnaire items had a

correct response of "no". The remaining questionnaire items had a correct response of "yes".

The questionnaire was utilized by three published studies regarding breastfeeding knowledge, attitudes, and intention (Baisch, Fox, & Goldberg, 1989; Berger & Winter, 1980; Pascoe, 1982). Validity and reliability were established by the successful use in these three previous studies. Two studies did not specify validation procedures (Berger & Winter, 1980; Pascoe, 1982). The third study did validate the questionnaire by having it reviewed by four nurse educators and a group of non-pregnant teens. Modifications for questionnaire clarity were made based on the reviewers' comments and knowledge (Baisch, Fox, & Goldberg, 1989).

The survey questions were grouped according to knowledge, attitude, and intention for the purpose of easy scoring. Participants were asked to select a response. Each positive response in part two scored one point. All negative responses scored zero points. The maximum possible points for this part was 25 points. This total score has been positively correlated to breastfeeding attitudes, knowledge, and intention in previous research. In addition to a total score, each questionnaire was assigned a knowledge score, attitude score, and intention score (Baisch, Fox, & Goldberg, 1989; Berger & Winter, 1980; Pascoe, 1982).

Knowledge. The questionnaire contained eleven questions regarding knowledge. These knowledge questions related to health, diet, lifestyle, maternal, and social issues. The maximum possible score for the knowledge section was eleven points. The score obtained reflected the current breastfeeding knowledge of the adolescent.



Attitude. The next thirteen questions were comprised of attitudinal factors affecting the decision to breastfeed. These questions assessed the attitudes of the adolescent towards exposure to breastfeeding, confidence, body image, and feelings regarding breastfeeding practice. This section of the questionnaire was designed to reveal the adolescent's attitude toward breastfeeding. A maximum score of thirteen points was possible in the attitude section.

Intention. The final question on the survey had two parts. The item asked the participant whether she had thought about the method she would choose to feed her infant. Section (a) stated "I will try to breastfeed", and section (b) stated "I have decided to breastfeed". Again, the adolescent was asked to select a "yes" or "no" response. One point was awarded for positive breastfeeding intention.

Illinois WIC Cornerstone database. The Illinois WIC Cornerstone database was a retrospective database which profiled all of the pregnant mothers enrolled in the Illinois WIC program during the 2000 calendar year. Data were in the form of official WIC reports that included the total number of pregnant women enrolled in WIC, total number of pregnant adolescents, and the breakdown of this information for each WIC agency in the State of Illinois. Breastfeeding initiation, duration, age, and ethnicity were included in the data set. No personal identifiers were used in this WIC Cornerstone computer database.

#### Data Collection Procedure

Prior to implementation of the procedures for this study, Institutional Review Board approval from the Springfield Committee for Research Involving Human Subjects and thesis committee approval were obtained.

Breastfeeding questionnaire. Data were obtained by administering the questionnaire to pregnant adolescents enrolled in WIC. Questionnaires were mailed to identified WIC agencies along with instructions to WIC personnel regarding administration. The questionnaire was given during WIC visits to adolescents meeting the criteria of the study design from each community setting. Study inclusion criteria were adolescents who were less than 17 years old at the time of conception from all ethnic backgrounds. Exclusion criteria were individuals with a history of mental incompetence or who were incarcerated. During a WIC visit, the questionnaire was administered by trained professionals from each community setting. The client was allowed to choose not to participate in the study and have her WIC visit in the same manner as she would have had in the absence of the study. The questionnaire could also be read to the client by the WIC professional if the client could not read English or Spanish. Confidentiality was assured in a written statement, and WIC personnel gave a brief verbal explanation of the study to each participant prior to questionnaire administration. The questionnaires were coded to the community setting and WIC agency, and completed data were returned to the researcher by mail. In addition, prior to beginning the data collection, the researcher met with the Illinois WIC Breastfeeding Coordinator and all of the Illinois WIC Regional Nutrition Consultants to discuss the study, answer any possible questions, and ensure uniform distribution of the questionnaire prior to implementation of the study.

Illinois WIC Cornerstone database. Additional data were obtained by contacting and requesting data from the Illinois Director of Nutrition Services. Following the completion of the 2000 calendar year, the database was mailed by the Illinois Director of Nutrition Services to the researcher for use in this study. This database was in the form of a computer disk.

### Data Analysis

Data obtained for this research study were nominal level data. Thus, statistical methods appropriate for this data level were utilized to answer the research questions. These methods included: descriptive statistics, crosstabulation, and Chi-square analysis. Results of Chi-square analysis were considered statistically significant if  $p < .05$  (Patten, 2000).

Data collected were analyzed to answer five research questions formulated for this study. Following is a description of how the specific data for each question were evaluated.

Research question one: What is the duration of breastfeeding practices of adolescent mothers participating in the Illinois WIC program? To address research question one, data from the Illinois WIC Cornerstone database were interpreted. Frequencies and percentages for breastfeeding duration were calculated in three-month increments. Statistical Package for the Social Sciences (SPSS) (SPSS Inc., 1999) was the program utilized to gather and assemble this data for analysis. Only usable data in the adolescent WIC population from the SPSS data file were included in the tabulation.

Research question two: To what extent does ethnicity influence prenatal breastfeeding attitudes, knowledge, and intentions of adolescent mothers participating in the Illinois WIC program? To address research question number two, crosstabulation and Chi-square analysis from questionnaire data were computed. The attitude, knowledge, and intention scores from the questionnaire were utilized in the comparison. The analysis was evaluated to determine differences in breastfeeding attitudes, knowledge, and intentions among different ethnic groups.

Research question three: To what extent do adolescent breastfeeding rates of adolescent mothers participating in the Illinois WIC program differ among rural, urban, and urbanized area community settings? To address research question number three, data from the Illinois WIC Cornerstone database were evaluated. Adolescent breastfeeding rates for the eighteen WIC agencies that completed research study questionnaires were calculated from the Illinois WIC Cornerstone database. These breastfeeding rates were determined for the entire Illinois WIC Cornerstone database sample and the selected database sample from the eighteen WIC agencies. The data were subsequently separated into the community setting categories to determine differences in the adolescent breastfeeding rates. Frequencies and percentages were calculated for the entire Illinois WIC Cornerstone database sample and for each community setting from the selected sample.

Research question four: To what extent do prenatal breastfeeding attitudes, knowledge, and intention of adolescent mothers participating in the Illinois WIC program vary among the rural, urban, and urbanized area community settings? To address research question number four, scores were calculated from the scored part

of the questionnaire which addressed breastfeeding knowledge, attitude, and intention. Each correct response in part two scored one point. All incorrect responses scored zero points (Baisch et al., 1989). The maximum possible points for this part was 25 points. In addition to a total score, each questionnaire was assigned a knowledge score, attitude score, and intention score. These scores were utilized in crosstabulation and Chi-square analysis to determine differences in breastfeeding attitudes, knowledge, and intentions among community settings.

Research question five: What is the relationship between plans to return to work and/or school, and adolescent breastfeeding intention in the rural, urban, and urbanized area community settings? To address research question number five, logistic regression was computed from questionnaire data. This method of evaluation was selected after statistical consultation (Verhulst, S., Statistical Consultant, Southern Illinois University School of Medicine, personal communication, February 12, 2001). The interrelationship among education level, plans to return to work and/or school, and adolescent breastfeeding intention was evaluated in this manner.

## Chapter 4

Results and Discussion

The presentation and discussion of the results of this study begin with a description of the questionnaire sample and the Illinois Cornerstone database sample. Following this, the results of each research question were discussed individually.

Description of the Sample

These study data were derived from two different sources. The first data source was a breastfeeding questionnaire that was distributed to WIC agencies throughout Illinois for distribution to pregnant adolescents during the December 2000 calendar month. The second data source was the Illinois WIC Cornerstone database which included information for pregnant WIC mothers enrolled in the Illinois WIC program during the calendar year 2000.

Questionnaire. Of thirty-one WIC agencies randomly selected for participation in the study, 18 (58.1%) agreed to participation. A total of 660 questionnaires were mailed to participating agencies along with a cover letter (Appendix A) from the researcher and a study fact sheet (Appendix B). Following this, a convenience sample of 171 participants from three community settings was obtained. Illinois WIC agencies from suburban Chicago (suburban) (n=35, 20%), central Illinois (urban) (n=102, 60%), and rural Illinois (n=35, 20%) represented the three community settings chosen for comparison. The total of 171 questionnaires reflected a 25% response rate. Samples of the English and Spanish questionnaire are included in Appendices C and D, respectively. These data quantified breastfeeding

attitudes, knowledge, and intentions from each community setting. The questionnaire also captured race, age, work and school attendance plans, and personal infant feeding information.

The mean total score was 17.9 points out of a possible 25 points. Mean score calculated for knowledge was 8.3 points (possible 11 points, 91.3%), attitude was 9.0 points (possible 13 points, 69.2%), and intention was 0.6 points (possible 1 point, 60%) (Table 2). These data appeared to suggest that WIC adolescents are knowledgeable about breastfeeding, but factors affecting their attitudes about breastfeeding interfered with their breastfeeding intention. This occurrence has been duplicated in previous research. Attitudinal factors affecting breastfeeding behavior may include family support, peer influence, body image, and significant other support (Baisch, Fox, & Goldberg, 1989; Berger & Winter, 1980; and Pascoe, 1982).

Table 2

Mean knowledge, attitude, and intention score for questionnaire (n=171)

Questionnaire Category	Possible Score	Mean Score	Percentage
Knowledge	11	8.3	91.3%
Attitude	13	9	69.2%
Intention	1	0.6	60.0%

Age and ethnicity analyses of questionnaire respondents were also assessed. Questionnaire respondents' (n=171) mean age of 16.6 years reflected the national trend of lower numbers of younger adolescents becoming pregnant (Curtin & Martin,

2000). Ethnicity data from the questionnaire sample data revealed the majority of the respondents were White (58%, n=100), followed by Black (25%, n=43), Hispanic (0.15%, n=25), American Indian, Eskimo, Aleut (0.01%, n=2), and the other category (0.006%, n=1) (Figure 2).

When comparing the ethnicity of the questionnaire sample to previous research, some differences were observed. The findings of this study revealed a higher percentage of the sample were White (58%) compared to previous study findings of 43% (Rassin et al., 1984) and 40% (Felice et al., 1987). One study reported a similar percentage of Blacks (22%) (Felice et al., 1987), compared to the 25% in this study. However, two studies (Lizarraga et al., 1992; Rassin et al., 1984) observed lower percentages of Blacks (11% and 9.2%), respectively. Similarly, the Hispanic population breakdown for this research study, 0.15%, was much lower than previously reported proportions of 67% (Lizarraga et al., 1992), 38% (Felice et al., 1987), and 23% (Rassin et al., 1984).



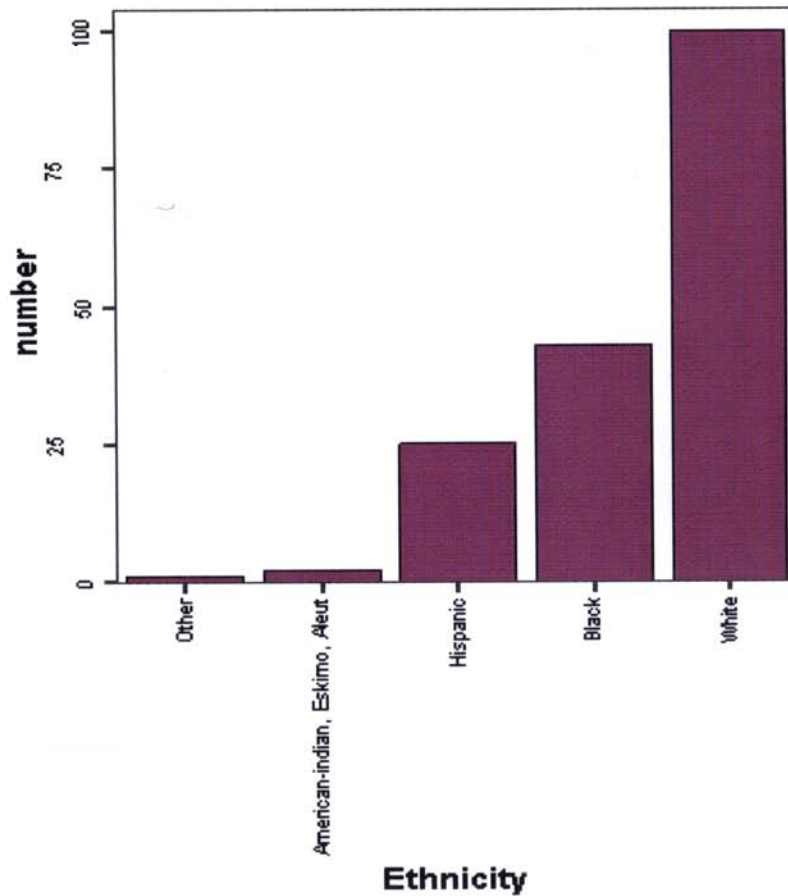
**Ethnicity of Breastfeeding Questionnaire Respondents****n = 171**

Figure 2. Ethnicity of Questionnaire Respondents

Illinois WIC Cornerstone database. The second data source was a retrospective database which profiled all of the pregnant mothers enrolled in the Illinois WIC program during the year 2000. A total of 70,423 pregnant women were enrolled in the Illinois WIC program during the calendar year 2000 of which 5,675 (8.1%) were adolescents.

Age and ethnicity analyses for the entire 2000 population of WIC adolescents were also determined. The mean age of the WIC adolescent population was 16.3 years. This again reflected the national trend of lower numbers of younger adolescents becoming pregnant (Curtin & Martin, 2000). When the mean age of the questionnaire sample (n=171) and the adolescent WIC population (N=5,675) were compared, virtually no difference was seen (16.6 years vs. 16.3 years).

In terms of ethnicity, the available data revealed the majority of the sample (n=5,654) were Black (n=2,509, 44%), followed by White (n=2,183, 38%), other (n=932, 16%; including Hispanic), Asian or Pacific Islander (n=23, 0.41%), and Native American (n=7, 0.12%). As illustrated in Figure 3, this sample had the highest percentage coming from the Black ethnicity (n=2509, 44%). In contrast, previous studies reported these percentages to ranged from 9-22% (Felice et al., 1987; Lizarraga et al., 1992; Rassin et al., 1984). This sample percentage of Blacks, 44%, was much higher in the 2000 adolescent WIC population compared to previous study findings of 9% (Rassin et al., 1984), 11% (Lizarraga et al., 1992), and 22% (Felice et al., 1987). Two studies (Felice et al., 1987; Rassin et al., 1984) reported similar percentages of Whites (40%, 43%) compared to the 38% reported in this study. In contrast, one study reported findings of an 11% White sample (Lizarraga et al., 1992). Due to the utilization of the "other" category in the Illinois WIC Cornerstone database, the exact number of Hispanics was not able to be determined. Although it was assumed that a large portion of the "other" category (n=932, 16%) was comprised of Hispanics, a direct comparison to other studies could not be made using these data. When compared to the questionnaire study

data (n=43, 25% Black), the 2000 population of WIC adolescents (n=5,654) had an increased percentage of Blacks (n=2509, 44%), but a direct comparison regarding Hispanics was unable to be made.

### Ethnicity of 2000 WIC Adolescents

n=5654

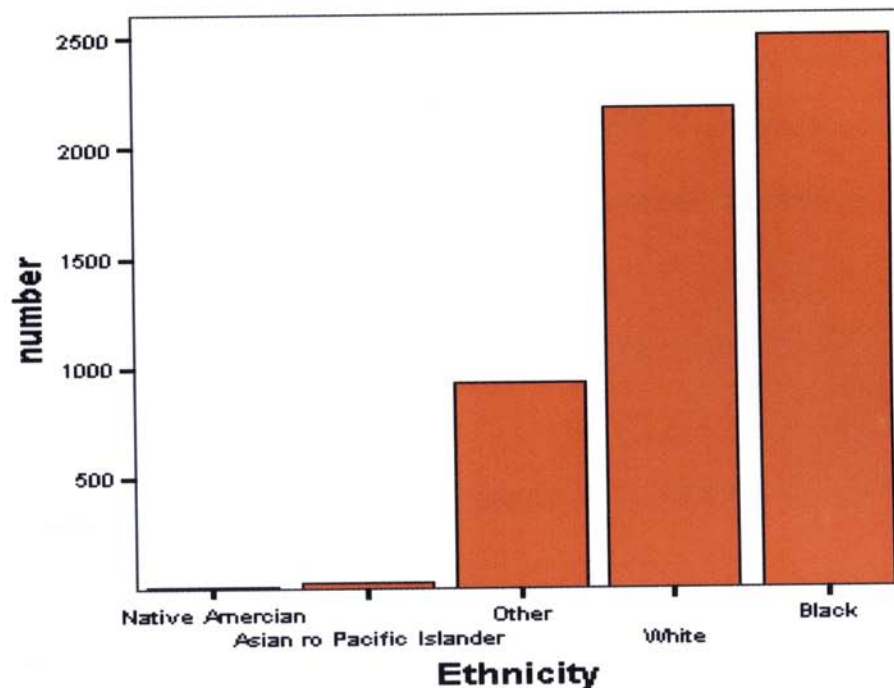


Figure 3. Ethnicity of 2000 WIC Adolescents

#### Research questions

Research question one: What is the duration of breastfeeding practices of adolescent mothers participating in the Illinois WIC program? To address research question one, data from the Illinois WIC Cornerstone Database were interpreted. Frequencies and percentages for breastfeeding duration were calculated in three-

month increments. All usable data (n=4,991) from the adolescent WIC population were included in the tabulation.

To determine the duration of breastfeeding for adolescent WIC mothers, the available data were assessed for breastfeeding practices throughout the first year of life. Data were missing for 684 of the 5,675 (n=4,991) adolescents included in the primary Illinois WIC Cornerstone database. Breastfeeding duration was categorized into three-month increments including 0 months, 1-3 months, 4-6 months, 7-9 months, and 10-12 months. Adolescents included in the 0-month category either did not initiate breastfeeding or breastfed less than 1 month. Frequencies and percentages were calculated for all categories of adolescent breastfeeding duration (Table 3).

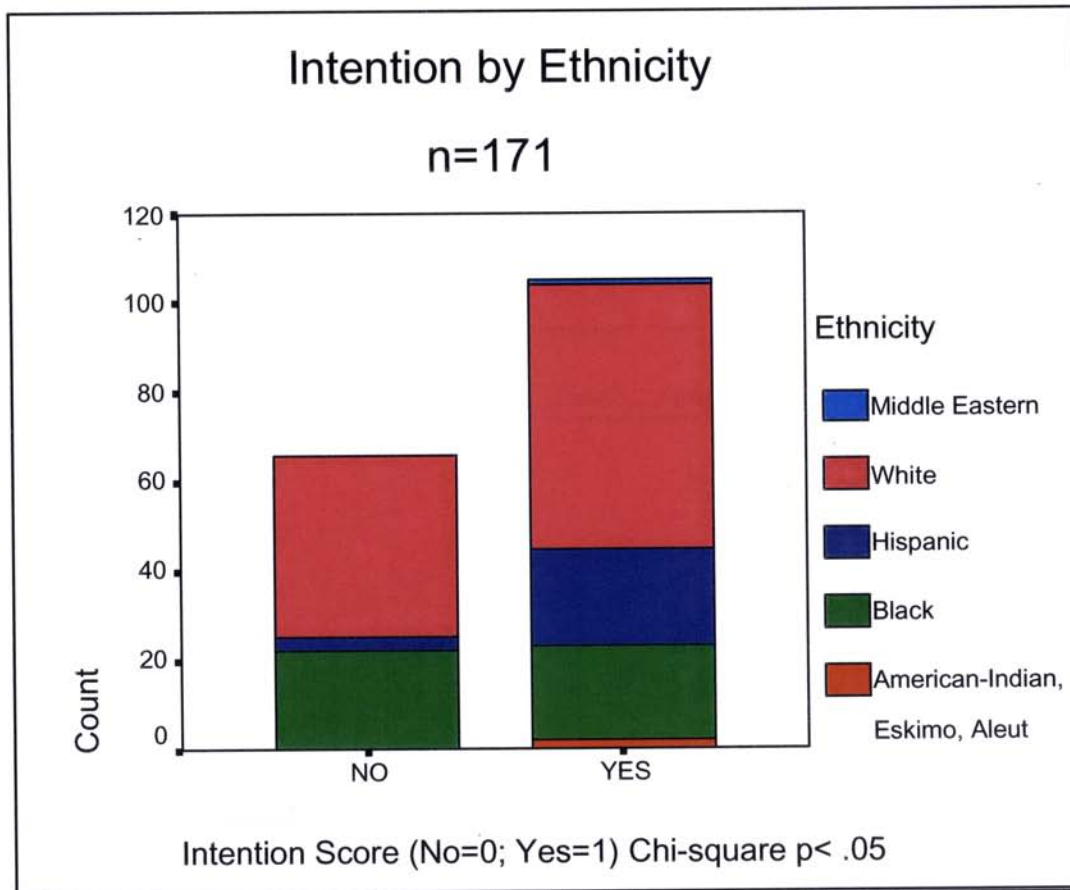
Table 3

Breastfeeding duration of 2000 WIC adolescents      n=4,991

Months	Frequency	Percent
0	4,278	85.7
1-3 months	559	11.2
4-6 months	111	2.2
7-9 months	21	< 0.1
10-12 months	22	< 0.1
TOTAL	4,991	100.0

Duration of breastfeeding for WIC adolescents (Table 3) reflected previous research findings. Results of the Ross Products Mother's Surveys of 1989 and 1995 revealed that breastfeeding at 6 months was increased in women who were older, multiparous, non-WIC participants, homemakers, and lived in Western states (Ryan et al., 1991; Ryan, 1997). The majority of the Illinois adolescent WIC mothers breastfed zero months (n=4,278, 85.7%), 1 to 3 months (n=559, 11.2%), and 4-6 months (n=111, 2.2%). These results illustrated the decreased breastfeeding duration in these young, WIC participants living in the Midwest.

Research question two: To what extent does ethnicity influence prenatal breastfeeding attitudes, knowledge, and intentions of adolescent mothers participating in the Illinois WIC program? To address research question number two, Chi-square analysis and crosstabulation from breastfeeding questionnaire data were computed. This analysis was evaluated to determine differences among different ethnic groups. Chi square analysis for ethnicity and attitude ( $p=0.74$ ), knowledge ( $p=0.79$ ), and intention ( $p < .05$ ) revealed only a statistically significant difference for breastfeeding intention among different ethnic groups (Figure 4).



**Figure 4.** Breastfeeding Intention by Ethnicity

Crosstabulation of breastfeeding knowledge, attitude, and intention revealed similar results. There appears to be little difference in knowledge and attitude with regard to ethnicity (Tables 4 and 5). However, the crosstabulation for intention (Table 6) and ethnicity exhibited an apparent difference. As displayed in Table 6, 22 of 25 Hispanic pregnant adolescents intended to breastfeed, while only 21 out of 43 Blacks, and 59 out of 100 Whites intended on breastfeeding. Hispanic adolescents

had a proportionately higher intention to breastfeed when compared to Black and Whites in the breastfeeding questionnaire sample.

Table 4

**Breastfeeding Knowledge by Ethnicity Crosstabulation**

Count							
		American-Indian, Eskimo, Aleut	Black	Hispanic	White	Middle Eastern	Total
Knowledge	1.00				1		1
	3.00				2		2
	4.00		2		1		3
	5.00		2	1	2		5
	6.00		7	3	7		17
	7.00		5	4	13		22
	8.00		5	6	18		29
	9.00		16	6	22		44
	10.00	1	4	4	25	1	35
	11.00	1	2	1	9		13
Total		2	43	25	100	1	171

<sup>a</sup> n=171

Table 5

**Breastfeeding Attitude by Ethnicity Crosstabulation**

Count		Ethnicity					Total
		American-Indian, Eskimo, Aleut	Black	Hispanic	White	Middle Eastern	
ATTITUDE	2.00				2		2
	3.00		1		1		2
	4.00		1	1	2		4
	5.00		3		6		9
	6.00		3		5		8
	7.00			2	12		14
	8.00		10	2	16		28
	9.00		9	2	17		28
	10.00	1	6	5	10		22
	11.00	1	5	6	17		29
	12.00		4	6	7	1	18
	13.00		1	1	5		7
Total		2	43	25	100	1	171

a. n=171

Table 6

**Breastfeeding Intention by Ethnicity Crosstabulation**

Count		Ethnicity					Total
		American-Indian, Eskimo, Aleut	Black	Hispanic	White	Middle Eastern	
INTENTIO	.00		22	3	41		66
	1.00	2	21	22	59	1	105
Total		2	43	25	100	1	171

0 = No; 1 = Yes

a. n=171



Research question three: To what extent do adolescent breastfeeding rates of adolescent mothers participating in the Illinois WIC program differ among rural, urban, and urbanized area community settings? To address research question number three, adolescent breastfeeding rates (n=953) for those eighteen WIC agencies that completed research study questionnaires and for the entire database population were calculated from the Illinois WIC Cornerstone database. Breastfeeding data were missing from 118 or 11% of the adolescents from the selected database sample. Frequencies and percentages were calculated for the entire Illinois WIC Cornerstone database population (N=5,675) as well as for the selected database sample (n=953) of rural (n=73), suburban (n=366), and urban (n=514) community settings separately (Tables 7 and 8).

Table 7

Breastfeeding behavior of 2000 WIC Adolescents

Breastfeeding Category	Frequency	Percent
CURRENTLY BREASTFEEDING	688	12.1
NEVER BREASTFED	3,671	64.7
INITIATED BREASTFEEDING	1,316	23.2
TOTAL	5,675	100.0

Source: Illinois WIC Cornerstone database

Table 8

2000 WIC adolescent breastfeeding practices based on community setting n=953

Breastfeeding Category	Rural		Suburban		Urban	
	n	%	n	%	n	%
CURRENTLY BREASTFEEDING	4	5.5	78	21.3	37	7.2
NEVER BREASTFED	32	43.8	193	52.7	306	59.5
INITIATED BREASTFEEDING	37	50.7	95	26.0	171	33.3
TOTAL	73	100.0	366	100.0	514	100.0

Source: Illinois WIC Cornerstone database

Adolescents in the Illinois 2000 WIC program initiated breastfeeding 23.2 percent of the time compared to 61.4 percent that intended to breastfeed according to the breastfeeding questionnaire sample data. These rates showed a much larger disparity in breastfeeding initiation and intent to do so when compared to data previously reported for the Hispanic population. Lizarraga et al. (1992) observed, by contrast, that 58% of Hispanic adolescents had initiated breastfeeding compared to a 72% intent to do so. These values were close to the national average of 20-30 percent for breastfeeding initiation, but they continued to fall short of the Healthy People 2010 Breastfeeding goal of 75% of mothers initiating breastfeeding in the early postpartum period (Healthy People 2010b, 2000; Lizarraga, et al., 1992).

When these percentages were evaluated for the three community settings in the eighteen WIC agencies (n=953) that completed questionnaires, differences were

observed (Table 8). Rural WIC agencies appeared to have higher breastfeeding initiation rates (50.7%) than suburban (26.0%) or urban agencies (33.3%). However, less than six percent were breastfeeding at the end of the 2000 calendar year. Due to this sharp decrease, further education and support would likely be beneficial to promote continuation of breastfeeding in this rural population.

The suburban community setting had the highest rate of adolescents still breastfeeding at the end of the 2000 calendar year (21.3% vs. 5.5% rural and 7.2% urban). This was possibly due to the Hispanic influence in these suburban areas. Hispanic adolescents have previously been shown to breastfeed their infants more often and for longer periods of time (Lizarraga, et al., 1992).

Urban adolescents fell close to the suburban community setting for those adolescents that initiated breastfeeding and never initiated breastfeeding (Table 7). Previous research did not document the relationship between community setting and breastfeeding behavior. This new information will allow Illinois WIC agencies to further tailor education programs to their specific client needs.

Overall, the results obtained from these WIC adolescents regarding breastfeeding initiation and duration were similar to findings from previous research. The 2000 Illinois adolescent WIC population demonstrated decreased rates of breastfeeding initiation and maintenance when compared to the Healthy People 2010 goals and other pregnant mothers. A prenatal breastfeeding education program tailored these pregnant women would likely be beneficial. Research has shown that these programs have the potential to increase breastfeeding initiation

and duration (Hartley & O'Conner, 1996; Kaplowitz & Olson, 1983; Krebs & Murtaugh, 1997; Kristen et al., 1990; Sciacca et al., 1995).

Research question four: To what extent do prenatal breastfeeding attitudes, knowledge, and intention of adolescent mothers participating in the Illinois WIC program vary among the rural, urban, and urbanized area community settings? To address research question number four, Chi-square analysis and crosstabulation from questionnaire data were completed to determine differences among community settings. Chi square analysis for community setting and attitude ( $p=0.27$ ), knowledge ( $p=0.43$ ), and intention ( $p=0.10$ ) revealed none of these items were significant at the  $p<.05$  level. The crosstabulation of breastfeeding knowledge (Table 9), attitude (Table 10), and intention (Table 11) yielded similar results. The disproportionate number of subjects from the three community settings likely influenced these results. In this sample, the suburban WIC population was underrepresented (20%,  $n=34$ ) and the urban population was overrepresented (60%,  $n=102$ ). However, when breastfeeding intention was assessed in percentages for the total sample ( $n=171$ ) as well as for each individual community setting, a breastfeeding intention rate of 61.4 percent was found. When analyzing this data further, a 50 percent intention rate for rural adolescents ( $n=34$ ), a 73.5 percent intention rate for suburban adolescents ( $n=34$ ), and a 78.4 percent intention rate for urban adolescents ( $n=102$ ) was noted. These results indicated suburban and urban adolescent had an approximately 50% higher breastfeeding intention rate when compared to rural adolescents. Although these results did not reveal a statistically significant difference in breastfeeding

attitudes, knowledge, and intentions among community settings, this remains an area for further study.

Table 9

**Breastfeeding Attitude by Community Setting** <sup>a</sup>

Count		Community Setting			Total
		suburban	rural	urban	
ATTITUDE	2.00		1	1	2
	3.00		1	1	2
	4.00			4	4
	5.00	1	1	7	9
	6.00		1	7	8
	7.00	1	3	10	14
	8.00	6	6	16	28
	9.00	6	7	15	28
	10.00	7	5	10	22
	11.00	6	5	18	29
	12.00	7	1	10	18
	13.00		4	3	7
Total		34	35	102	171

<sup>a</sup>. n=171

Table 10.

**Breastfeeding Knowledge by Community Setting Crosstabulation**

<sup>a</sup>

Count		Community Setting			Total
		suburban	rural	urban	
KNOWLEDG	1.00		1		1
	3.00			2	2
	4.00		2	1	3
	5.00	2		3	5
	6.00	2	2	13	17
	7.00	3	5	14	22
	8.00	6	7	16	29
	9.00	9	6	29	44
	10.00	8	8	19	35
	11.00	4	4	5	13
Total		34	35	102	171

<sup>a</sup> n=171

Table 11.

**Breastfeeding Intention by Community Setting Crosstabulation**

Count		Community Setting			Total
		suburban	rural	urban	
INTENTION	.00	9	18	39	66
	1.00	25	17	63	105
Total		34	35	102	171

0 = no; 1 = yes

<sup>a</sup> n=171

Research question five: What is the relationship between plans to return to work and/or school, and adolescent breastfeeding intention in the rural, urban, and urbanized area community settings? To address research question number five, logistic regression was computed from breastfeeding questionnaire data. This evaluation method was selected after statistical consultation (Verhulst, S., Statistical Consultant, Southern Illinois University School of Medicine, personal communication, February 12, 2001). Logistic regression performed to analyze the interrelationship among education level, plans to return to work and/or school, and adolescent breastfeeding intention in the rural, urban, and urbanized area community settings was inconclusive. The individual correlations for each of these variables was approximately zero. Thus, no relationship between these factors existed.

#### The Theory of Planned Behavior

The Theory of Planned Behavior has been previously successful as a theory base for breastfeeding education programs. It is important to understand the stimulus for individuals to breastfeed when developing education programs. Data obtained in this study suggested that WIC adolescents are knowledgeable regarding breastfeeding, but factors affecting their breastfeeding attitudes appear to exist. These factors interfered with their intention to breastfeed (Table 2 and Figure 1). Thus, these results supported the Theory of Planned Behavior. This occurrence has been duplicated in previous research. The attitudinal issues affecting breastfeeding intention may include family support, peer influence, body image, and significant

other support (Baisch, Fox, & Goldberg, 1989; Berger & Winter, 1980; and Pascoe, 1982).

Several studies have identified the relationship between attitude, subjective norm, and perceived behavioral control to breastfeeding intention, initiation, and duration. They also identify early weaning as a significant problem in adolescents (Wambach, 1997; Avery et al., 1998; and Duckett et al., 1998). Variables such as childcare, breastfeeding problems, and postpartum employment plans were found to be predictive of early weaning behavior and breastfeeding duration. The results of this study were inconclusive in the evaluation for the relationship between education level, plans to work and/or school, and adolescent breastfeeding intention in the three community settings. Further, the relationship of these breastfeeding early weaning and duration factors could not be refuted or supported by this research study.



## Chapter 5

Summary, Conclusions, and ImplicationsSummary

The purpose of this thesis research was to investigate the prenatal breastfeeding attitudes, knowledge, intentions, and breastfeeding practices of adolescent mothers from diverse ethnic populations in the Illinois WIC program, and comparison of adolescents from three community settings were made. The relationship of these practices to educational level and plans to return to work and school was analyzed. To this date, there is a lack of breastfeeding information about the WIC adolescent in Illinois.

These study data were derived from two different sources. The first data source was a breastfeeding questionnaire that was distributed to WIC agencies throughout Illinois for distribution to pregnant adolescents during the December 2000 calendar month. The second data source was the Illinois WIC Cornerstone database which included pregnant WIC mothers enrolled in the Illinois WIC program during the calendar year 2000.

Of 31 WIC agencies randomly selected for participation in the study, 18 (58.1%) agreed to participate. A total of 660 questionnaires were mailed to participating agencies along with a cover letter (Appendix A) from the researcher and a study fact sheet (Appendix B). Following this, a convenience sample of 171 participants from three community settings was obtained. Illinois WIC agencies from suburban Chicago (suburban) (n=35, 20%), central Illinois (urban) (n=102, 60%), and rural Illinois (n=35, 20%) represented the three community settings chosen for

comparison. The total of 171 questionnaires reflected a 25% response rate.

Samples of the English and Spanish questionnaire are included in Appendices C and D, respectively. These data quantified breastfeeding attitudes, knowledge, and intentions from each community settings. The questionnaire also captured race, age, work and school attendance plans, and personal infant feeding information.

The mean total score was 17.9 points out of a possible 25 points. Mean score calculated for knowledge was 8.3 points (possible 11 points, 91.3%), attitude was 9.0 points (possible 13 points, 69.2%), and intention was 0.6 points (possible 1 point, 60%) (Table 2). These data appeared to suggest that WIC adolescents are knowledgeable about breastfeeding, but factors affecting their attitudes about breastfeeding interfered with their breastfeeding intention. This occurrence has been duplicated in previous research. Attitudinal factors affecting breastfeeding behavior may include family support, peer influence, body image, and significant other support (Baisch, Fox, & Goldberg, 1989; Berger & Winter, 1980; and Pascoe, 1982).

Age and ethnicity analyses of questionnaire respondents were also assessed. Questionnaire respondents' (n=171) mean age of 16.6 years reflected the national trend of lower numbers of younger adolescents becoming pregnant (Curtin & Martin, 2000). Ethnicity data from the questionnaire sample data revealed the majority of the respondents were White (58%, n=100), followed by Black (25%, n=43), Hispanic (0.15%, n=25), American Indian, Eskimo, Aleut (0.01%, n=2), and the other category (0.006%, n=1) (Figure 2).

When comparing the ethnicity of the questionnaire sample to previous research, some differences were observed. The findings of this study revealed a

higher percentage of the sample were White (58%) compared to previous study findings of 43% (Rassin et al., 1984) and 40% (Felice et al., 1987). One study reported a similar percentage of Blacks (22%) (Felice et al., 1987), compared to the 25% in this study. However, two studies (Lizarraga et al., 1992; Rassin et al., 1984) observed lower percentages of Blacks (11% and 9.2%), respectively. Similarly, the Hispanic population breakdown for this research study, 0.15%, was much lower than previously reported proportions of 67% (Lizarraga et al., 1992), 38% (Felice et al., 1987), and 23% (Rassin et al., 1984).

The second data source was a retrospective database which profiled all of the pregnant mothers enrolled in the Illinois WIC program during the year 2000. A total of 70,423 pregnant women were enrolled in the Illinois WIC program during the calendar year 2000 of which 5,675 (8.1%) were adolescents.

Age and ethnicity analyses for the entire 2000 population of WIC adolescents were also determined. The mean age of the WIC adolescent population was 16.3 years. This again reflected the national trend of lower numbers of younger adolescents becoming pregnant (Curtin & Martin, 2000). When the mean age of the questionnaire sample (n=171) and the adolescent WIC population (N=5,675) were compared, virtually no difference was seen (16.6 years vs. 16.3 years).

In terms of ethnicity, the available data revealed the majority of the sample (n=5,654) were Black (n=2,509, 44%), followed by White (n=2,183, 38%), other (n=932, 16%; including Hispanic), Asian or Pacific Islander (n=23, 0.41%), and Native American (n=7, 0.12%). As illustrated in Figure 3, this sample had the highest percentage coming from the Black ethnicity (n=2,509, 44%). This sample percentage of Blacks,

44%, was much higher in the 2000 adolescent WIC population compared to previous study findings of 9% (Rassin et al., 1984), 11% (Lizarraga et al., 1992), and 22% (Felice et al., 1987). Two studies (Felice et al., 1987; Rassin et al., 1984) reported similar percentages of Whites (40% and 43%), respectively compared to the 38% reported in this study. In contrast, one study reported findings of an 11% White sample (Lizarraga et al., 1992). Due to the utilization of the "other" category in the Illinois WIC Cornerstone database, the exact number of Hispanics was not able to be determined. Although it was assumed that a large portion of the "other" category (n=932, 16%) was comprised of Hispanics, a direct comparison to other studies could not be made using these data. When compared to the questionnaire study data (n=43, 25% Black), the 2000 population of WIC adolescents (n=5,654) had an increased percentage of Blacks (n=2,509, 44%), but a direct comparison regarding Hispanics was unable to be made.

Adolescents in the Illinois 2000 WIC program initiated breastfeeding 23.2 percent of the time compared to 61.4 percent that intended to breastfeed according to the breastfeeding questionnaire sample data. These rates showed a much larger disparity in breastfeeding initiation and intent to do so when compared to data previously reported for the Hispanic population. Lizarraga et al. (1992) observed, by contrast, that 58% of Hispanic adolescents had initiated breastfeeding compared to a 72% intent to do so. These values were close to the national average of 20-30 percent for breastfeeding initiation, but they continued to fall short of the Healthy People 2010 Breastfeeding goal of 75% of mothers initiating breastfeeding in the early postpartum period (Healthy People 2010b, 2000; Lizarraga, et al., 1992).

When these percentages were evaluated for the three community settings in the eighteen WIC agencies (n=953) that completed questionnaires, differences were observed (Table 8). Rural WIC agencies appeared to have higher breastfeeding initiation rates (50.7%) than suburban (26.0%) or urban agencies (33.3%). However, less than six percent were breastfeeding at the end of the 2000 calendar year. Due to this sharp decrease, further education and support would likely be beneficial to promote continuation of breastfeeding in this rural population.

The suburban community setting had the highest rate of adolescents still breastfeeding at the end of the 2000 calendar year (21.3% vs. 5.5% rural and 7.2% urban). This was possibly due to the Hispanic influence in these suburban areas. Hispanic adolescents have previously been shown to breastfeed their infants more often and for longer periods of time (Lizarraga, et al., 1992).

Urban adolescents fell close to the suburban community setting for those adolescents that initiated breastfeeding and never initiated breastfeeding (Table 7). Previous research did not document the relationship between community setting and breastfeeding behavior. This new information will allow Illinois WIC agencies to further tailor education programs to their specific client needs.

Overall, the results obtained from these WIC adolescents regarding breastfeeding initiation and duration were similar to findings from previous research. The 2000 Illinois adolescent WIC population demonstrated decreased rates of breastfeeding initiation and maintenance when compared to the Healthy People 2010 goals and other pregnant mothers. A prenatal breastfeeding education

program tailored these pregnant women would likely be beneficial. Research has shown that these programs have the potential to increase breastfeeding initiation and duration (Hartley & O'Conner, 1996; Kaplowitz & Olson, 1983; Krebs & Murtaugh, 1997; Kristen et al., 1990; Sciacca et al., 1995).

Chi-square analysis and crosstabulation from questionnaire data completed to determine differences among community settings yielded the following results. Chi square analysis for community setting and attitude ( $p=0.27$ ), knowledge ( $p=0.43$ ), and intention ( $p=0.10$ ) revealed none of these items were significant at the  $p<.05$  level. The crosstabulation of breastfeeding knowledge (Table 9), attitude (Table 10), and intention (Table 11) yielded similar results. The disproportionate number of subjects from the three community settings likely influenced these results. In this sample, the suburban WIC population was underrepresented (20%,  $n=34$ ) and the urban population was overrepresented (60%,  $n=102$ ). However, when breastfeeding intention was assessed in percentages for the total sample ( $n=171$ ) as well as for each individual community setting, a breastfeeding intention rate of 61.4 percent was found. When analyzing this data further, a 50 percent intention rate for rural adolescents ( $n=34$ ), a 73.5 percent intention rate for suburban adolescents ( $n=34$ ), and a 78.4 percent intention rate for urban adolescents ( $n=102$ ) was noted. These results indicated suburban and urban adolescent had an approximately 50% higher breastfeeding intention rate when compared to rural adolescents. Although these results did not reveal a statistically significant difference in breastfeeding attitudes, knowledge, and intentions among community settings, this remains an area for further study.

Logistic regression computed from breastfeeding questionnaire data yielded the following results. Logistic regression performed to analyze the interrelationship among education level, plans to return to work and/or school, and adolescent breastfeeding intention in the rural, urban, and urbanized area community settings was inconclusive. The individual correlations for each of these variables was approximately zero. Thus, no relationship between these factors existed.

### Strengths

The research performed achieved the purpose of investigating the prenatal breastfeeding attitudes, knowledge, intentions and breastfeeding practices of adolescent mothers from diverse ethnic populations in the Illinois WIC program. Multiple strengths of this study were identified. First, the study provided breastfeeding information for adolescents living in the Midwest. There had been a lack of such previous breastfeeding data on adolescents in this geographic location. It was difficult to extrapolate data previously obtained from other ethnic backgrounds and regions of the country due to multiple confounding factors in the research.

A second strength of this study was that the information collected will contribute to required needs assessment information for developing breastfeeding promotion programs for adolescents in the Illinois WIC population. In the past, the primary source of breastfeeding information was the formula manufacturer, Ross Laboratories. This information will be shared with the Illinois State Breastfeeding Coordinator and Nutrition Services Coordinator from the Illinois Department of Human Services to aid in the development of these programs.

A final strength of this study was that the information gathered was detailed into defined community settings. By having the information specific for a defined community setting, the educational programs that will be developed can be tailored to fit the needs of each community setting regarding the attitudes, knowledge, and intention of the adolescents in that community.

#### Limitations

One major limitation was identified for this research study. This limitation related to the small and disproportionately distributed sample analyzed for the questionnaire data. This sample size likely limited the significance of the statistical analysis for this research study. The sample analyzed was limited for multiple reasons, and it may not accurately represent the population of pregnant WIC adolescents. First, the inconsistent number of questionnaires received from the WIC agencies in the different community settings, may lead to non-response bias. There is a possibility that the attitudes, knowledge, and intentions of the adolescents surveyed varied from that of the total population.

Second, the sample was also limited due to difficulties encountered with the Institutional Review Board (IRB) from the Chicago Department of Public Health. This prevented the fourth community setting, central place, from being incorporated into the study because of delay in IRB approval. This limitation will be corrected in the near future because IRB approval has been received, and the central place community setting is currently being surveyed therefore allowing for inclusion of this information in the needs assessment discussed earlier.



Third, the method of distribution for the questionnaire also limited the sample size of this study. Relying on outside agencies to distribute and return questionnaires was a key limiting factor. The questionnaires were distributed around the busy, holiday season possibly resulting in a problem with understaffing at the WIC agencies. Also, although support for the project was obtained from the Illinois Department of Human Services, participation from each WIC agency was on a volunteer basis. Often, limited staffing situations were a constraint mentioned by the selected WIC agencies.

### Conclusions

Five research questions were identified for this study. The following section contains conclusions for each of the five research questions previously presented.

Question one: What is the duration of breastfeeding practices of adolescent mothers participating in the Illinois WIC program?

Duration of breastfeeding for WIC adolescents reflected previous research findings. Results of the Ross Products Mother's Survey of 1989 and 1995 revealed that breastfeeding at 6 months was increased in women who were older, multiparous, non-WIC participants, homemakers, and lived in Western states (Ryan et al., 1991; Ryan, 1997). The majority of the WIC adolescent mothers studied breastfed 0 months (n=4,278, 85.7%), 1 to 3 months (n=559, 11.2%), and 4-6 months (n=111, 2.2%). These results illustrated the decreased breastfeeding duration in these young, WIC participants living in a Midwestern state .

Question two: To what extent does ethnicity influence prenatal breastfeeding attitudes, knowledge, and intentions of adolescent mothers participating in the Illinois

WIC program? Results of the study revealed a statistically significant difference ( $p < .05$ ) for breastfeeding intention among different ethnic groups. Hispanic adolescents had a proportionately higher intention to breastfeed when compared to Black and Whites in this questionnaire sample. These findings also indicated there was little difference in knowledge and attitude with regards to ethnicity.

Question three: To what extent do adolescent breastfeeding rates of adolescent mothers participating in the Illinois WIC program differ among rural, urban, and urbanized area community settings? Based on these study data, differences in breastfeeding rates are likely to occur in rural, suburban, and urban community settings. Rural WIC agencies appeared to have higher breastfeeding initiation rates (50.7%) than suburban (26.0%) or urban agencies (33.3%). However, less than six percent were breastfeeding at the end of the 2000 calendar year. In addition, the suburban community setting had the highest rate of adolescents still breastfeeding at the end of the 2000 calendar year (21.3% vs. 5.5% rural and 7.2% urban). Breastfeeding education programs tailored to these community settings would likely be beneficial.

Question four: To what extent do prenatal breastfeeding attitudes, knowledge, and intention of adolescent mothers participating in the Illinois WIC program vary among the rural, urban, and urbanized area community settings? No statistically significant difference was observed when comparing the three different community settings and the attitudes, knowledge, and intention of the adolescent WIC mothers. These results were likely influenced by the disproportionate number of subjects from the three community settings. Although these results did not reveal a difference in

breastfeeding attitudes, knowledge, and intentions among community setting, this remains an area for further study.

Question five: What is the relationship between plans to return to work and/or school, and adolescent breastfeeding intention in the rural, urban, and urbanized area community settings? The interrelationship among education level, plans to return to work and/or school, and adolescent breastfeeding intention in the rural, urban, and urbanized area community settings was inconclusive. The individual correlations for each of these variables was approximately zero. Thus, no relationship between these factors existed. This is an area that requires further study.

#### Implications

The results of this research study were consistent with previous data concerning ethnicity in relationship to breastfeeding attitudes, knowledge, and intentions. In combination with the information regarding the three community settings, these data will help design and implement community breastfeeding programs beneficial to the pregnant WIC adolescent. The possible addition of community setting individualization will only further personalize these education programs for the Illinois WIC population and likely enhance their effectiveness.

There were five primary findings of this research study:

1. Adolescent breastfeeding rates in the Illinois WIC population are similar to the nationally reported adolescent breastfeeding rates, but they remain short of the Healthy People 2010 National Health Promotion Program breastfeeding goals.

2. Community setting does appear to make a difference in the breastfeeding practices of adolescents. Breastfeeding education programs tailored to these community settings would likely be beneficial.

3. The results of this study appear to indicate that adolescents in the Illinois WIC program possess knowledge regarding breastfeeding as reflected in the high knowledge scores from the questionnaire sample. However, decreased attitudinal scores and breastfeeding intention were also observed. These data appeared to suggest that WIC adolescents are knowledgeable about breastfeeding, but factors affecting their attitudes about breastfeeding interfered with their breastfeeding intention. Adolescent breastfeeding education programs targeted at these attitudinal factors would likely be beneficial.

4. Based on this study, adolescents in the Illinois WIC program from rural community settings appear to have increased breastfeeding initiation rates but decreased breastfeeding duration. This might suggest that interventions aimed at increasing breastfeeding duration of adolescents in this community setting would likely be beneficial.

5. Based on this study, adolescents in the Illinois WIC program from suburban community settings appear to have increased breastfeeding duration, despite decreased breastfeeding initiation rates. Education efforts aimed at increasing breastfeeding initiation as well as reinforcing breastfeeding duration of adolescents in this community setting would likely be beneficial.

It was hypothesized that there would be a difference in breastfeeding attitudes, knowledge, and behavior among ethnic populations and among

community settings. These predictions were demonstrated by this study. The completion of this research study will likely aid WIC professionals in the breastfeeding education and promotion program development for adolescents. Overall, breastfeeding professionals must continue their efforts to provide more detailed data regarding adolescent breastfeeding practices. Adolescent breastfeeding education programs tailored to different ethnicities and community settings would likely be beneficial.

#### Suggestions for Future Research

Although this study evaluated a needed aspect of adolescent breastfeeding, there are still many questions regarding this subject. First, the influence of the presence of a WIC clinic in a school setting on the resulting breastfeeding rate should be evaluated. These mothers are a target population for breastfeeding education and promotion. Secondly, the influence of subsequent pregnancy or parity and failed breastfeeding attempts should also be considered. These factors may be affecting the adolescent breastfeeding practices observed. Finally, a large prospective study assessing the breastfeeding intention and subsequent practice of WIC adolescents in different community settings would be valuable. Such a study would likely result in statistically significant findings and the identification of specific factors affecting the breastfeeding intentions and practice of WIC adolescents. Overall, the outcomes of these studies will provide useful breastfeeding data to health professionals working with Illinois WIC adolescents.

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**Appendix A**

November 27, 2000

Dear WIC Professional:

Thank you for agreeing to participate in my research study titled: *Adolescent Breastfeeding Practices of Illinois Women, Infant, and Children Program Participants*. The purpose of this research is to investigate the prenatal breastfeeding attitudes, knowledge, intentions, and practices of adolescent mothers from diverse ethnic populations in the Illinois WIC Program. The relationship of these practices to educational level and plans to return to work and/or school will be identified, and a comparison of adolescents from four community settings will also be made.

It is hypothesized that there will be a difference in breastfeeding attitudes and behavior among ethnic populations and among community settings. Exposure to breastfeeding models and information may be limited among this adolescent population and differences may exist among community settings.

The long-term objective of this study is to increase the breastfeeding rate in the adolescent WIC population in Illinois. Prior to implementing interventions for this long-term objective, this needs assessment must be done.

I have enclosed a colored file folder with blank surveys, a self-addressed return envelope, and my business card. All responses will be kept **confidential**, and no identifiers will be used. Each clinic will be assigned a number code for tracking purposes only. Data collection will end **January 15, 2001**. Using the enclosed self-addressed stamped envelope, please return the completed questionnaires and colored file folder. Feel free to contact me with any questions you may have about this process.

Again, thank you for your cooperation and participation in this study.

Sincerely,

Rebecca Antonacci, RD, LD, CLC  
Instructor  
Southern Illinois University School of Medicine  
Department of Obstetrics and Gynecology  
Springfield, Illinois

rantonacci@siumed.edu

Appendix B

Thank you for participating in this adolescent breastfeeding study.

Data collection will continue through January 15<sup>th</sup>, 2001. Please return the completed questionnaires in the provided return envelope at this time.

Any currently pregnant WIC adolescent may participate in the study. The questionnaire may be read to the client if the client cannot read.

Please feel free to duplicate the questionnaires if more copies are needed.

Contact Becky Antonacci, RD at 217-785-3848 or [rantonacci@siumed.edu](mailto:rantonacci@siumed.edu) if assistance is needed.

**Appendix C**

**Questionnaire: Prenatal breastfeeding attitude and knowledge assessment**

**PURPOSE:** The purpose of this survey is to investigate the prenatal breastfeeding attitudes, knowledge, and intentions of adolescents in the Illinois WIC population.

**CONFIDENTIALITY:** All responses will remain confidential.

**Part 1**  
Please circle your response.

1. What is your current age? \_\_\_\_\_
2. Do you consider yourself?
 

American-Indian, Eskimo and Aleut	Asian and Pacific Islander
Black	
Hispanic	White
3. What was your last grade completed in school?      6 7 8 9 10 11 12  
or more
4. Do you plan to return to school after your baby's birth?  
Yes                      No
5. How soon do you plan to return to school after your baby's birth?  
Never      1-3 months      4-6 months      7-9 months  
1year or more
6. Do you work?  
Yes                      No
7. How soon do you plan to return to work after your baby's birth?  
Never      1-3 months      4-6 months      7-9 months  
1year or more
8. How were you fed as a baby?  
Bottle      Breast                      Bottle and breast                      Don't know
9. How was the father of the baby fed as a baby?  
Bottle      Breast                      Bottle and breast                      Don't know



10. Did you intend to become pregnant?  
Yes            No

**Part 2**

**Please circle your response.**

**Breastfeed(ing) will be abbreviated by "BF"**

1. Breastfeeding (BF) is the healthiest feeding for the infant.  
Yes   No
2. BF is natural.  
Yes   No
3. BF is cheaper than formula feeding.  
Yes   No
4. BF means no one else can feed the baby.  
Yes   No
5. BF means I can't go back to school.  
Yes   No
6. BF means I can't go back to work.  
Yes   No
7. BF means I have to eat differently.  
Yes   No
8. BF is convenient for the mother.  
Yes   No
9. BF promotes mother-baby bonding.  
Yes   No
10. BF leads to weight gain of the mother.  
Yes   No
11. BF helps the figure of the mother.  
Yes   No
  
12. BF is old-fashioned.  
Yes   No
13. I would feel embarrassed if someone saw me BF.  
Yes   No
14. BF disturbs family life.  
Yes   No
15. BF is not modern.  
Yes   No
16. BF makes your breasts sag.  
Yes   No
17. Have you ever seen your mother, or relative BF?  
Yes   No

18. Have you ever seen a friend BF?  
Yes No
19. I have heard that it is good to BF.  
Yes No
20. I would like to know more about BF.  
Yes No
21. I think BF is nasty.  
Yes No
22. I have heard that BF hurts.  
Yes No
23. My boyfriend/support person wants me to breastfeed.  
Yes No
24. I am tired of hearing about BF.  
Yes No
  
25. Have you thought about how you will feed your infant?
  - a. I will try to breastfeed.  
Yes No
  - b. I have decided to formula feed.  
Yes No

## Appendix D

**Objeto:** El objeto de está cuestionario es para evaluar en la población de Illinois WIC las actitudes respecto al concimiento, e intenciones que tiene los jovened para dar el pecho a su bebé.

**Confidencial:** Todos los repuestos serán mantenidas en un lugar seguro y serán confidenciales.

## Parte 1

Por favor, marque con un circulo su repuesta.

1. ¿Cuántos años tiene usted \_\_\_\_\_
2. ¿ De que raza o grupo étnico se considera usted?  
 Indio-Americano, Eskimal, Aleut                      Asiantico, Islander-Pasifico  
 Afro-Americano,  
 Hispanico/Latina                      Caucásico
3. ¿Cuál fue el último grado que ud. completó?    6 7 8 9 10 11 12 o más
4. ¿Va a volver a esuela después del nacimiento de su bebé?  
 Sí                      No
5. ¿Cuándo quiere volver a la escuela después del nacimiento de su bebé?  
 Nunca              1-3 meses    4-6 meses    un año o más
6. ¿Tiene un empleo?  
 Sí                      No
7. ¿Cuándo quiere volver al trabajo después del nacimiento de su bebé?  
 Nunca              1-3 meses    4-6 meses    un año o más
8. ¿Como alimenta a su bebé?  
 Botella              Pecho              Botella y pecho              No sé
9. ¿Como alimentaron al padre cuado era bebé?  
 Botella              Pecho              Botella y pecho              No sé
10. ¿ Tenía la intención de embarazarse?  
 Sí                      No

**Parte 2**

**Por favor, marque con un circulo su respuesta.**

**Dar el pecho se abreviará como "DEP"**

1. Dar el pecho (DEP) es más saludable para el infante.  
Sí No
2. DEP es natural.  
Sí No
3. DEP es mas barato que la fórmula.  
Sí No
4. DEP significa que nadie pueda alimentar el bebé.  
Sí No
5. DEP significa que no puedo volver a trabajo.  
Sí No
6. DEP significa que no puedo volver a la escuela.  
Sí No
7. DEP significa que tengo que comer de una manera diferente.  
Sí No
8. DEP es conveniente para la madre.  
Sí No
9. DEP une más la madre con el bebé.  
Sí No
10. DEP lleva al aumento de peso de la madre.  
Sí No
11. DEP ayunda la figura de la madre.  
Sí No
  
12. DEP está pasado de moda.  
Sí No
13. DEP me hace sentir avergonzada si alguna persona me ve DEP.  
Sí No
14. DEP altera la vida da familia.  
Sí No
15. DEP no es moderna.  
Sí No
16. DEP hace el pecho comba.  
Sí No
17. En el pasado, ¿ vió su madre o pariente DEP?  
Sí No
18. ¿ Vió a una amiga DEP?  
Sí No
19. ¿Oí que es mejor dar el pecho al bebé?  
Sí No

20. ¿ Quiero saber más sobre DEP?  
Sí No
21. Pienso que DEP es sucio.  
Sí No
22. Oí que DEP me lastimaría.  
Sí No
23. Mi novio, compañero/a, o esposo quiere que le de el pecho.  
Sí No
24. No quiero oír más de DEP.  
Sí No
25. ¿ Piensa como va a alimentar su bebé?  
a. Trataré darle el pecho  
Sí No  
b. Voy a usar fórmula.  
Sí No

**Translated by: Laura Weis, B. S., Spanish Curriculum Director Riverton High School, Riverton, Illinois**