

**BREASTFEEDING SELF-EFFICACY IN WOMEN OF AFRICAN DESCENT**

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Running head: BREASTFEEDING SELF-EFFICACY

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**ABSTRACT OF A DISSERTATION SUBMITTED TO THE FACULTY OF THE  
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## Abstract

Black women (women of African descent) have the lowest rate and duration of breastfeeding compared to other racial groups. Breastfeeding self-efficacy, defined as a mother's belief that she will be able to organize and carry out the actions necessary to breastfeeding her infant, has been shown to predict breastfeeding pattern and duration, but has not been studied in black women. The purpose of this study was to examine the relationship between breastfeeding self-efficacy and duration and pattern of breastfeeding. Black women (N = 155) with full-term infants who were planning to breastfeed were recruited from a large urban teaching hospital in New England. Breastfeeding self-efficacy was measured using the Breastfeeding Self-Efficacy Scale-Short Form (BSES-SF) (Dennis, 2003). Self-efficacy and demographic data were collected during the first postpartum week by written questionnaire. At one month postpartum, 143 women completed the follow-up interview. At this time, breastfeeding pattern and duration data were collected by telephone interview. Higher BSES-SF scores were predictive of longer breastfeeding duration ( $p = .04$ ) and more exclusive breastfeeding pattern ( $p < .01$ ) in this sample, consistent with prior research with other samples. Planned pattern of feeding (exclusive or in combination with formula) was also predictive of the actual pattern of feeding ( $p < .01$ ). Variables predictive of breastfeeding self-efficacy included previous breastfeeding experience, planned exclusive breastfeeding, education, ethnicity and level of network support for breastfeeding. Based on self-efficacy theory, interventions designed to enhance breastfeeding self-efficacy will help improve breastfeeding outcomes. Further research with larger samples is needed to understand if there are significant differences in self-efficacy among ethnic groups. Research designed to determine if self-efficacy mediates the influence of demographic variables on breastfeeding outcomes is also needed.

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The manuscript contained herein represents a mountaintop experience of my career as a nurse, and now as a scholar. The climb to this mountaintop has been an adventure, sometimes arduous, but always rewarding. From this mountaintop, the view of where I have been is breathtaking. I can see so many people and so many experiences that have contributed to my success in this endeavor. My life has been rich with mentors and role models, even from the beginning of my career as a new graduate nurse. Without them I could never have even conceived of attempting this goal of a PhD, let alone actually achieve it. It is my sincere desire that I can pass on that gift, and be a mentor and role model to many others.

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## CHAPTER I: INTRODUCTION

Breastfeeding has numerous health benefits for both mothers and infants. A goal of the U.S. Department of Health and Human Services (U.S. Department of Health and Human Services (DHHS), (2002) is to increase to 75% the proportion of mothers who breastfeed their infants in the early postpartum period, and to increase to 50% those who continue to breastfeed for six months. Currently, 64% of all mothers breastfeed their infants in the early postpartum period, and 29% breastfeed for six months. However, significant racial disparities exist. For women of African descent (black women), the rate of breastfeeding in the early postpartum period is 45%, compared to white women at 68%. At six months postpartum, black women breastfeed at a rate of 19%, as compared to white women at 31%. Although the proportion of black women who breastfeed has increased (Ahluwalia, Morrow, Hsia, & Grummer-Strawn, 2003), the rate still falls below national goals and differs significantly from the proportion of white women who breastfeed their infants.

Women of African descent are generally referred to either as Black or as African-American. However, among black women in the United States, many ethnic origins are represented, including Cape Verdean, Haitian, West Indian/Caribbean, African and African-American, with many individuals describing themselves as multiracial (Black, 1996). Some black women would also identify themselves as Hispanic or Latina. Many black individuals do not identify themselves as Black or African-American, but rather by

their country of origin (Black). Thus, in order to include all black women of all ethnic backgrounds, the term “women of African descent,” a term used by Black, has been used in recruitment of research participants. Being “of African descent” is used as a substitute for the Black/African-American racial category as it is described in census data (U.S. Census Bureau, 2000). However for the sake of simplicity in this manuscript, women of African descent will henceforth be referred to as black women. In this case, black is used as an adjective to include all women sharing a similar skin color, who are of African descent, rather than a racial category.

Self-efficacy, a key concept of Social Cognitive Theory is defined as “the belief in one’s capabilities to organize and execute the courses of actions required to produce given attainments” (Bandura, 1997, p. 3). Previous researchers (Ertem, Votto, & Leventhal, 2001) have acknowledged the important influence of maternal confidence on breastfeeding behavior. Maternal confidence can also be described as breastfeeding self-efficacy (Dennis & Faux, 1999). Breastfeeding self-efficacy is defined as a mother’s belief that she will be able to organize and carry out the actions necessary to breastfeed her infant. Breastfeeding self-efficacy has been shown to predict duration of breastfeeding, as well as whether a mother chooses to exclusively breastfeed or to breastfeed in combination with formula (Blyth et al., 2002).

The purpose of this study was to examine breastfeeding self-efficacy in relationship to breastfeeding duration and pattern in black women. It is hoped that the results will better inform practice and research related to possible interventions to increase the breastfeeding rate among black women.

## Review of the Literature

### *Health Benefits of Breastfeeding*

In their policy statement on breastfeeding, the American Academy of Pediatrics described and summarized current understanding about the health benefits of breastfeeding (AAP, 2005) including a decreased incidence of infectious diseases, decreased rates of sudden infant death syndrome (SIDS), and reductions in incidence of type 1 and type 2 diabetes mellitus, lymphoma, leukemia, Hodgkin disease, obesity and overweight, hypercholesterolemia and asthma, as compared to individuals who have not been breastfed. These health benefits are particularly significant for black infants, in light of the health disparities between blacks and whites (DHHS, 2002).

*Breastfeeding and cognitive development.* Quinn, Williams, Najman, Andersen & Bor (2001) found that breastfeeding significantly benefited child development as measured by a standardized picture vocabulary test, after controlling for other confounding factors, while Jacobson, Chiodo, & Jacobson (1999) found that IQ measurements in children who were breastfed were higher, but not significantly when adjusting for the mother's IQ. These studies addressing the benefits of breastfeeding on cognitive development (Jacobson et al.; Quinn et al.) differ in their conclusions, demonstrating that developmental outcomes purportedly related to breastfeeding are confounded by environmental, genetic and social factors.

Drawing conclusions about breastfeeding's influence on cognitive development is difficult from these and other studies because of differences in measuring cognitive development and defining breastfeeding. The benefits to cognitive development also



seem to be related to the duration of breastfeeding (Mortensen, Michaelsen, Sanders, & Reinisch, 2002). However, research studies suggest that breastfeeding may enhance cognitive development in infants born small for gestational age (Rao, Hediger, Levine, Naficy & Vik, 2002) and in infants born preterm (Lucas, Morley, Cole, Lister, & Leeson-Payne, 1992). Black infants are more likely to be born at a low birth weight, and therefore breastfeeding could help to provide this cognitive benefit. In addition, breastfeeding has particular benefits for infants born preterm (Callen & Pinelli, 2005), and black infants have the highest rate of preterm birth in the United States (DHHS, 2002).

*Breastfeeding and cardiovascular benefits.* Recently, researchers have found an association between breastfeeding and blood pressure. Martin, Ness, Gunnell, Emmett, and Smith (2004), in a prospective cohort study, compared children who were never breastfed to children who were breastfed (partially or exclusively) at 7.5 years of age. They found that breastfed children had significantly lower blood pressures than children who had never been breastfed, after adjusting for socioeconomic factors and maternal and child body mass index (BMI). After adjusting for social and economic factors and body weight of parents and children, Lawlor et al. (2004) found that children who were breastfed for at least 6 months had lower blood pressures than those who were never breastfed or breastfed for less than 6 months. The effect of breastfeeding on preventing high blood pressure was also found in a sample of children born prematurely, when blood pressure was measured at age 13 to 16 (Singhal, Cole, & Lucas, 2001). It is not clear how significant the effect of breastfeeding on blood pressure is clinically, or whether it has

public health importance (Owen, Whincup, Gilg, & Cook, 2003). However, because blood pressure is associated with cardiovascular disease, and blood pressure in childhood may influence this risk, breastfeeding may be significant in reducing the population distribution of high blood pressure (Lawlor et al. 2004). Preventing high blood pressure through breastfeeding has the potential to contribute to the improvement of cardiovascular health, particularly for blacks, who have the highest rates of death from coronary heart disease and stroke, and the highest proportion of adults with high blood pressure as compared to other racial groups (DHHS, 2002).

*Breastfeeding and reduced risk of obesity.* Another recent area of study addresses the association between breastfeeding and the risk of obesity across the life course. In a review of published evidence, Owen, Martin, Whincup, Smith, and Cook (2005) concluded that breastfeeding does protect against obesity later in life, although they acknowledge that many confounding factors such as social class and parental obesity also contribute to obesity. Owen et al. did note that prolonged breastfeeding and more exclusive breastfeeding were associated with an additional reduction in obesity, which would support the presence of a dose-response relationship (Owen et al.; Raisler, Alexander, & O'Campo, 1999). Recognizing that obesity is a significant and complex problem affecting the health of children, the American Academy of Pediatrics (2003) recommended breastfeeding as one of the means of preventing childhood overweight and obesity. Blacks have the lowest proportion of adult women who are at a healthy weight and the largest proportion of adult women who are obese as compared to other racial groups. Black children are among the racial groups most likely to be obese (DHHS,

2002). Obesity is also a risk factor for diabetes. Breastfeeding is associated with a decreased risk of diabetes, and blacks are more likely to suffer from diabetes and its complications. Deaths from diabetes are two times higher for blacks than for whites (DHHS). Breastfeeding could have a significant short and long-term impact on the prevention of both obesity and diabetes.

*Breastfeeding and asthma.* Asthma rates are higher in blacks than whites and asthma hospitalization and deaths related to asthma are higher for blacks (DHHS, 2002). Evidence linking breastfeeding to asthma is conflicting, but Sears et al. (2002) found that prolonged or exclusive breastfeeding protected young children (under age 2), but not older children, from eczema and wheezing illness. Oddy (2004) described the importance of breastfeeding to the development of the infant's immune system and the impact this has on respiratory infection, allergies and the incidence and severity of asthma later in childhood, concluding that breastfeeding appears to have beneficial effects for protection against asthma. Kull, Almqvist, Lilja, Pershagen, and Wickman (2004), in a large prospective cohort study ( $N = 4,089$ ) in Sweden concluded that exclusive breastfeeding for 4 months does reduce the risk of asthma at the age of 4 years. The socioeconomic status of the participants was not reported in this study. Oddy et al. (2004), in a large prospective cohort study in Australia ( $N = 2,860$ ) reported that less exclusive breastfeeding was associated with an increase in asthma in children, and interestingly, a higher BMI was also a risk factor for asthma. In this Australian sample, socioeconomic status did not significantly contribute to either asthma or BMI. These

researchers identified the importance of the dose of breastfeeding as well, as exclusive breastfeeding provided the most protective effects against asthma.

*Breastfeeding benefits to the mother.* The benefits of breastfeeding extend to the mother as well as the child. In an analysis of 47 epidemiological studies, the Collaborative Group on Hormonal Factors in Breast Cancer (2002) found that a woman's risk of breast cancer declined by 4% for each year that she breastfed. This finding is consistent in developed and developing countries, and represents an additional protection over and above the decreased risk of breast cancer related to pregnancy and birth. Other benefits to the mother include a decreased risk of ovarian cancer (Rosenblatt, Thomas, & The WHO Collaborative Study of Neoplasia and Steroid Contraceptives, 1993) and possibly a decreased risk of hip fractures and osteoporosis (Cummings & Klineberg, 1993). There is some evidence that breastfeeding helps mothers to lose weight after birth. This effect is most significant when the mother breastfeeds exclusively for at least 6 months (Lederman, 2004).

*Breastfeeding and infant mortality.* Breastfeeding has been shown to decrease infant mortality both in developed and developing countries (Cunningham, Jelliffe, & Jelliffe, 1991). Although this benefit is often seen to be of more significance to infants in developing countries, Forste, Weiss, and Lippincott (2001) found in comparing black and non-black women in the United States, controlling for income, education, age, marital status, employment, smoking status, parity, type of delivery and region of residence, that breastfeeding accounted for the race differences in infant mortality as much as did low birth weight, with breastfeeding having a protective effect.

*Measuring Breastfeeding “Dose”*

The relationship between the amount or “dose” of breastfeeding and the health benefits has been noted in research on cognitive development (Mortensen et al., 2002) as well as when analyzing rates of diarrheal illness, upper respiratory infections, ear infections and fever (Raisler et al., 1999). This highlights the importance of measuring and accounting for the amount of breastfeeding when conducting and evaluating research findings. Measuring the “dose” of breastfeeding should include distinguishing between exclusive breastfeeding and various combinations of breastfeeding and formula feeding (Labbok & Krasovec, 1990) as well as the duration of breastfeeding. Piper and Parks (2001) describe this same concept as an “intensity ratio”, calculated by the number of breast milk feeds divided by the total number of all liquid feeds. They found that a higher intensity ratio was associated with longer breastfeeding duration.

*Health Benefits of Breastfeeding for Black Infants*

One of the goals of *Healthy People 2010* (DHHS, 2002) is to eliminate health disparities. Black individuals have higher mortality and morbidity from coronary heart disease, stroke, hypertension, diabetes, obesity and asthma than whites. Significant racial disparities also exist in the amount of breastfeeding, measured by breastfeeding rate, duration and exclusivity. Blacks have the lowest rates of breastfeeding initiation and duration. The health benefits of breastfeeding are well-documented. The amount, or dose, of breastfeeding, measured in both the duration and the level of exclusivity, appears to influence the impact of these health benefits. Increasing the breastfeeding rate among

blacks could have a significant impact on both short and long-term health of black infants.

### Factors Influencing Breastfeeding Initiation and Duration

#### *Demographic Factors Associated with Breastfeeding*

*Race and breastfeeding.* The DHHS (2002) reported lower rates of breastfeeding among blacks as compared to white or Hispanic women, but did not distinguish between levels of breastfeeding (exclusive or combined with formula). The 2002 National Immunization Survey (Li, Darling, Maurice, Barker, & Grummer-Strawn, 2005) showed that in the United States, based on a sample of 3,444 children, 71.4% of all children had been breastfed to some extent. Of the 502 black children in the sample, 51.5% of them had ever been breastfed to any extent (as compared to 72.1% of white children). At one month, this percentage was 43.6%, dropping to 19.7% at 6 months. In this survey, Hispanic women had the highest breastfeeding rates. When rates of *exclusive* breastfeeding were reported, 39.5% of black infants were breastfed exclusively at one month, and 5.4% at 6 months.

Bonuck, Freeman, and Trombley (2005) addressed the importance of racial and ethnic factors in the planned pattern of feeding in a sample that included 106 U.S.-born black women and 37 foreign-born black women. Women were asked their intended feeding pattern when they presented for prenatal care. Of the 143 black women in the sample, 65 (45%) planned to breastfeed in combination with formula, while only 46 (32%) planned exclusive breastfeeding, and 17 (12%) planned to formula feed only. Twenty-eight (20%) had not yet decided on a feeding plan. Interestingly, the only

significant variable associated with the intensity of intent to breastfeed was the country of origin. Women who were born in the continental United States were more likely to choose combination feeding (formula and breast feeding) rather than exclusive breastfeeding. Among the 142 black, non-Hispanic women in the sample, the ethnic backgrounds reported were Jamaican, Caribbean and African. There were six women in the sample who identified themselves as West Indian, but not as black, and they were not included in the analysis (Bonuck et al.). This study highlights the importance of addressing ethnicity as well as race in order to understand influences on breastfeeding intentions.

Although the racial disparities in breastfeeding rates are well-documented, none of the large epidemiologic studies described ethnic backgrounds of the black women studied. It cannot be assumed that people representing so many different ethnic backgrounds would have the same beliefs and behaviors, simply because they share a similar skin color. The statistics about breastfeeding distinguished only among the five racial categories used in U.S. Census Data, in which Black or African-American are included in one category (U.S. Census Bureau, 2000). In reality, the black population in the United States is very heterogeneous; by ethnicity, and also by history, economics and social characteristics. In order to understand the influence of race on breastfeeding, the effects of culture, ethnicity and socioeconomic factors must be considered.

*Geographic variations in breastfeeding rates.* In the National Immunization Survey (Li et al., 2005), the country was divided into nine regions, including New England, middle Atlantic, east north central, west north central, south Atlantic, east south central,

west south central, mountain and Pacific. The region that had the highest proportion of children who were ever breastfed was the Pacific region, and the lowest proportion was in the east south central region of the country. Breastfeeding rates in the New England region were the third highest, following the mountain region. Not surprisingly, these breastfeeding rates corresponded to the variations in public opinion about breastfeeding reported in a study by Hannan, Li, Benton-Davis, and Grummer-Strawn (2005). The most positive attitudes about breastfeeding in public were found in the mountain, New England and Pacific region. However, respondents from New England were among the least informed about the health benefits of breastfeeding. Attitudes about breastfeeding policy were more consistent across all regions, with a large number of people reporting that they believed employers should provide flexible work schedules and extended maternity leave to make it easier for breastfeeding mothers (Hannan et al.).

*Breastfeeding and employment outside the home.* Studies related to employment and its effect on breastfeeding suggests that the need to work outside the home is likely to influence breastfeeding duration as well as the pattern of breastfeeding. Women who work outside the home are less likely to be able to breastfeed exclusively once they return to work. Most of the studies however, were conducted with largely white samples of women with reasonably high incomes; thus, little is known about the influence of employment on breastfeeding for black women.

The Infant Feeding Practices Study (Fein & Roe, 1998) described the effects of work status on infant feeding in a sample of 1,488 women drawn from a consumer mail panel designed to be balanced on the characteristics of geographic region, income,



population density, household size and age, relative to the U.S. Census. Inclusion criteria were that a member of the household was pregnant and due within three months of the survey. They found that full-time employment after childbirth had a negative effect on both breastfeeding initiation and duration. Compared to not working at all, part-time employment did not have an effect on initiation or duration, but did have an effect on the pattern of breastfeeding, in which the more hours a mother worked, the less breast milk the child received, including expressed breast milk. Compared to a nationally representative sample of mothers, the respondents to this mailed survey were more likely to be white, married and older. Mail panels require respondents to be stable and literate, thus limiting the generalizability of the results (Fein & Roe).

Lindberg (1996), using data from the National Survey of Family Growth, in which black women were over sampled, also found that women who worked part-time were more likely to breastfeed, and to breastfeed for a longer duration, than those that worked full-time. In this study, 37% of the sample was black. Analyses were stratified by race. Among women who worked full-time, black women were more likely to stop breastfeeding than white women. Lindberg also found a strong association between the timing of weaning the infant (discontinuing breastfeeding) and the timing of returning to employment after maternity leave for both black and white women. McKinley and Hyde (2004) conducted a longitudinal study of 548 primarily European American women recruited for the Wisconsin Maternity Leave and Health Project, and found that being employed was related both to the intent to breastfeed for shorter periods of time and also to a shorter duration of breastfeeding.

Studies of the reasons that women discontinued breastfeeding also provide some insight into the influence of employment on breastfeeding. McLeod, Pullon and Cookson (2002), in a prospective study of New Zealand women who were receiving care in an urban setting, addressed various social and experiential influences on the duration and pattern of breastfeeding. Participants answered questions by written mailed questionnaire during the prenatal period, and again at six to ten weeks postpartum. Respondents were less likely to be breastfeeding if they returned to work or school (McLeod et al.). In this sample, respondents were asked their ethnicity, but only Maori ethnicity (the indigenous people of New Zealand) (yes/no) was reported, and the majority of the sample (96%) was not of Maori ethnicity. Receiving an income-tested subsidy for health care was considered to be a proxy for socioeconomic status, and the sample was divided into two categories of socioeconomic status; deprived or not deprived, based on this criterion. Twenty percent of the sample was categorized as socio-economically deprived (McLeod et al.).

Returning to work was found to be an important reason for weaning by Schwartz et al. (2002). In a prospective cohort study, Schwartz et al. recruited 946 breastfeeding women in Michigan and Nebraska. The participants from Michigan were recruited from women attending orientation at a freestanding birthing center. The women in Nebraska were recruited when applying for maternity leave from a large company. The groups were reported to be similar in race, household income and marital status, but the actual data were not recorded for these variables. It is presumed that the sample was largely white, as the authors suggested an inability to generalize their results to women of color.

Respondents were interviewed by telephone at 3, 6, 9 and 12 weeks postpartum.

Returning to work was given as the most common reason for discontinuing breastfeeding in weeks 7 through 9 (53% of those weaning at 7 to 9 weeks gave this as the reason) and weeks 10 to 12 (58% of the sample of those weaning at weeks 10 to 12 gave this as the reason).

Similar results of the effect of employment on weaning were found by Taveras et al. (2003). In a prospective cohort study, 1,163 low-risk mother infant-pairs in a managed care group practice in California were interviewed. Data were collected during face-to-face interviews during the postpartum hospitalization and telephone interviews at 2 and 12 weeks postpartum. In this sample, 62% were white, 12% Hispanic, 6% black, 5% Asian, 11% multicultural and 3% other. Sixty-five percent of the sample reported household incomes of over \$30,000/year, but 14% reported incomes less than \$20,000/year. Most mothers were married and had at least some college education. By 10 to 12 weeks postpartum, returning to work or school was one of the strongest predictors of breastfeeding discontinuation (58% of the sample). Socioeconomic status was more likely to predict breastfeeding continuation during the first few days of breastfeeding (Taveras et al.).

In a study of predictors of breastfeeding duration for employees of the WIC program, Whaley, Meehan, Lange, Slusser, and Jenks (2002) reported that availability of work-site breast pumps had a significant influence on breastfeeding duration, suggesting that the environment of the workplace of employed mothers has an impact on breastfeeding duration. This sample included 108 participants, all of whom were

categorized as paraprofessionals (with a high school diploma or the equivalent). Ninety percent of the sample was Hispanic, 7.4% African-American, 6.6% white and 4.1% Asian. Interestingly, 79.6% of the sample reported the intent to breastfeed exclusively, which also was a predictor of longer breastfeeding duration.

Socioeconomic status is likely to influence the impact of employment on breastfeeding. Women who must return to work because of economic necessity or lack of job protection are often those who have lower incomes, and who work in the casual and informal sectors of the labor market, which includes an overrepresentation of women of color (Galtry, 2000). These jobs are often lower-skilled positions which do not offer the job flexibility or negotiating power to demand facilities for expressing milk on the job or access to their infants, and maternity leaves are likely to be unpaid (Galtry, 2000). Only a small proportion of women in the United States are employed in management and professional positions which at least theoretically gives them more control over their work environment (Galtry, 1997; Wootton, 1997), allowing access to and the ability to take advantage of policies which encourage breastfeeding. This would suggest that it is not simply employment, but the nature of the employment that influences whether women are able to combine working and breastfeeding.

It is possible that the gender mix in the employment setting may have an influence on breastfeeding as well. The gender mix has been reported as a factor in job satisfaction and psychological well-being, because of its influence on sexism and gender discrimination (Bond, Punnett, Cazeca, & Cooperman, 2004). Because breastfeeding is by nature gender-specific, attempting to combine employment and breastfeeding could

lead to gender discrimination. In order to understand the influence of employment on breastfeeding for black women, they must be adequately represented in research studies, and the nature of the employment must also be addressed.

All of these studies suggest that maternal employment has some effect on breastfeeding, including an influence on the intended duration of breastfeeding, the actual duration of breastfeeding and the pattern of breastfeeding. It appears that the type of employment also influences breastfeeding, and this may vary by the characteristics of the employment setting. The influence of employment on breastfeeding is summarized using an ecological framework by Johnston and Esposito (2007) who describe characteristics of the individual woman, her support system and her work environment (including maternity leave). Influences at each of these levels may either facilitate or create barriers to successfully combining breastfeeding and employment outside the home (Johnston & Esposito).

*Other variables associated with breastfeeding.* Several other demographic variables have been associated with breastfeeding, including age, marital status, education and varying measures of socioeconomic status (Callen & Pinelli, 2004; Dennis, 2002; Scott and Binns, 1999). Breastfeeding has been positively associated with increasing age and education, and positively associated with higher socioeconomic status. In some, but not all studies, breastfeeding is more common in married women (Scott & Binns). Another variable associated with breastfeeding was smoking, with smokers less likely to initiate breastfeeding (Dennis; Scott & Binns). Parity has also been associated with breastfeeding, but less consistently. Fein and Roe (1998) reported that mothers who

had not previously breastfed were less likely than new mothers to initiate breastfeeding, but those who had breastfed previously were more likely to breastfeed. Duration of breastfeeding for mothers who had previously breastfed appeared to be related to the number of children they had breastfed, with longer durations if they had breastfed two or more children. Mode of delivery has been suggested as a factor influencing breastfeeding. Some studies report a negative influence of Cesarean birth on breastfeeding, while others report no effect of the mode of delivery on breastfeeding (Dennis).

*Psychosocial Factors Influencing Breastfeeding Initiation and Duration*

*Maternal attitudes.* Studies identify various maternal attitudes that influence breastfeeding; however none of these studies included a significant representation of black women in the sample. In a review of the literature, Scott and Binns (1999) reported that most studies indicated that prenatal intention to breastfeed is a strong predictor of the duration of breastfeeding. A mother's knowledge about breastfeeding's health benefits and her attitudes about breastfeeding were also identified as factors. This was noted by Kong and Lee (2004) in a sample of primiparas in Hong Kong, and by Scott, Shaker and Reid (2004) in a sample of pregnant women in Scotland. McKinley and Hyde (2004) confirmed the importance of the correlation between intention and duration, but also described the influence of enjoyment of breastfeeding, with greater enjoyment of breastfeeding being predictive of longer duration of breastfeeding. This sample included mostly white women in Wisconsin (McKinley & Hyde).

*Confidence.* Many researchers have addressed the importance of a mother's confidence in predicting breastfeeding behavior, although not all have included black

women in the sample. Ertem et al. (2001) did however have a representation of black women in a longitudinal study of English-speaking mothers who received their health care at Yale New Haven Hospital in Connecticut. Inclusion criteria included eligibility for WIC, the delivery of a healthy, full-term newborn, the intent to receive pediatric care at the hospital's primary care center, and having initiated breastfeeding in the first 48 hours of the infant's life. Sixty-four women participated in the study. Fifty-six percent were black and 35% were Puerto Rican. Data were collected by a semi-structured interview conducted on the postpartum unit, a telephone interview at one week postpartum, a face-to-face interview at the infant's two-week pediatric visit, and a review of medical records at two and four months of the age of the infant. They found that a mother's lack of confidence that she could breastfeed for two months (as identified in the baseline interview) strongly predicted the discontinuation of breastfeeding as reported at the two-month data collection (Ertem et al.).

A small percentage of black women were represented in a study by Tavaras et al. (2003), addressing reasons mothers discontinued breastfeeding. These mothers were low-risk mothers recruited from a large health maintenance organization in California. Only 6% of the sample included black mothers, as most were either white (62%) or Hispanic (12%). They found that lack of confidence reported in an interview at one to two days postpartum predicted the discontinuation of breastfeeding by two weeks postpartum.

Dennis and Faux (1999), in a sample of primarily white, middle-class Canadian women, found a strong correlation between maternal confidence, measured as breastfeeding self-efficacy, and the pattern of breastfeeding at 6 weeks postpartum, with

more confident mothers being more likely to be exclusively breastfeeding at 6 weeks postpartum. Creedy, Dennis, Moyle, Pratt, and DeVries (2003) also found that maternal confidence predicted whether a mother would be breastfeeding at 4 months postpartum. This research was conducted with a sample of Australian women, of whom 86% were Caucasian, 4% were Australian aboriginal, 4% were Asian and 6% were of other ethnic origin. Most of the women had a minimum of a high school education (Creedy et al.).

*Perception of milk supply.* Closely related to confidence is the perception of a breast milk supply adequate to meet the infant's needs. Creedy et al. (2003) using a sample of Australian women, found significant correlations between an instrument designed to measure breastfeeding confidence, the Breastfeeding Self-Efficacy Scale, and with the maternal confidence subscale of the H&H Lactation scale (HHLS). Maternal confidence, the belief that one can breastfeed successfully, is one of three indicators of maternal perception of milk supply in the HHLS (Hill & Humenick, 1996).

Studies of reasons for discontinuation of breastfeeding also cite insufficient milk as a common reason for weaning. This was noted by Arora, McJunkin, Wehrer, & Kuhn (2000), using a sample of 245 mothers from a family practice in Pennsylvania, of whom 85.5% were white, and 11.3% were black. Using a mailed survey sent to mothers who had children between the ages of six months and three years, women provided information about reasons for initiating as well as discontinuing breastfeeding. The results showed that the inability to assess how much milk the baby was getting was a common reason for formula feeding.



Binns and Scott (2002) studied a cohort of mothers from Western Australia, and recruited them in the hospital where they completed a baseline questionnaire, and followed up with telephone interviews at 2, 6, 10, 14, 18 and 24 weeks postpartum. Race was not reported in this study, but it was reported that most of the women were born either in Australia or the United Kingdom. Almost 25% of the women interviewed who had expressed anxiety over their milk supply at the two-week interview had weaned their infants by six weeks postpartum. The most common reason given for stopping breastfeeding in the first two weeks was that the infant appeared unsettled, which may be related to a perception of insufficient milk. Throughout the study period, concern about milk supply persisted for approximately 10% of the sample of 556 mothers (Binns & Scott).

Ertem et al. (2001) conducted a study with a sample consisting primarily of women of color eligible for WIC. They found that a perception of insufficient milk was reported by 28.1% of the sample at the 2-week measurement. In this study however, perception of insufficient milk did not predict early termination of breastfeeding. Insufficient milk supply was also reported as a breastfeeding problem in a study by Tavaras et al. (2003). In this study, women were interviewed at two and twelve weeks postpartum, and provided information about the timing of and their reasons for discontinuing breastfeeding. Twenty-seven percent reported not having enough milk at zero to one week, and 38% reported insufficient milk at four to six weeks postpartum, giving this as their reason for weaning.

It has been suggested that mother's perception of an insufficient milk supply leads to early weaning (Binns & Scott, 2002), and early introduction of bottles may be an indicator of this perception. A mother's perception of insufficient breast milk may indicate an actual inadequacy of milk, or may simply be a perception related to lack of confidence. In either case, the outcome may be formula supplementation or weaning (Hill & Humenick, 1997). In a study of risks for cessation of breastfeeding, Hall et al. (2002) reported that the number of bottles given to an infant during the maternity hospitalization was one of eight significant predictors of weaning by 7 to 10 days postpartum, with the odds of weaning increasing with each bottle of formula used. Their sample was recruited from nine hospitals in the Kansas City metropolitan area. No racial or ethnic information was reported for this sample of 1,108 mother-infant pairs. Although the reasons for giving bottles is not identified in this study (Hall et al.), early supplementation with bottles of formula has been shown to be associated with a decrease in breast milk and with early weaning (Hill & Humenick). Thus either real or perceived insufficient milk supply can negatively influence breastfeeding pattern (exclusive breastfeeding or combination of breastfeeding and formula) and duration.

McCarter-Spaulding and Kearney (2001) found a relationship between parenting confidence, defined as parenting self-efficacy, and perception of milk supply in a sample of 60 well-educated, married, white women in the greater Boston area. Women with higher levels of parenting confidence also had lower scores on a scale measuring perception of insufficient milk supply (thus perception of a greater milk supply).

*Social support.* Social support clearly has an influence on breastfeeding behavior. However, it is the characteristics of the social support network that are likely to determine the nature of the support received for breastfeeding. Members of the network are most likely individuals with something in common, and therefore the social network and social support would be expected to be influenced by the cultural context. The social network may or may not contain role models for breastfeeding, depending on social norms. House and Kahn (1985) suggested that when one is trying to make a change in role or identity, a social network with weaker ties and more social and cultural heterogeneity would be preferred over a smaller, closer more homogenous network. Such would be the case if a woman were choosing to breastfeed her infant when this was not the norm in her social or cultural context.

Heaney and Israel (2002) acknowledged that during times of transition and change, such as having a new baby, networks that are larger, more diffuse and less emotionally intense may be more able to facilitate social outreach and exchange of informational support. Thus, breastfeeding support may not necessarily be provided by the closest members of the network. The social support for breastfeeding in some contexts may be negative, depending on the attitudes and opinions of the network members (McIntyre, Hiller, & Turnbull, 2001).

Social support is widely acknowledged as an important factor influencing breastfeeding success. Raj and Plitcha (1998) in a review of literature on breastfeeding and social support, reported that social support can either be positive or negative for breastfeeding confidence and persistence, and that sources of support vary according to a

woman's age, social class, ethnic group or culture. Humphreys, Thompson, and Miner (1998) studied the influence of social support on the intention to breastfeed in low-income pregnant women. Support in this study was described as members of the woman's support network, including health professionals as well as family and friends. The intention to breastfeed was positively correlated with hearing about breastfeeding's benefits from family members and the baby's father. Advice from health professionals was less influential than that from the woman's social support network (Humphreys et al.).

The importance of the infant's father to the support of breastfeeding has been frequently studied and acknowledged to influence both the decision to breastfeed and the duration of breastfeeding (Bar-Yam & Darby, 1997). Pollock, Bustamante-Forest, and Giarratano (2002) sampled men of diverse racial backgrounds, and asked fathers about their knowledge and attitudes about breastfeeding. The fathers were asked if they would support the infant's mother in breastfeeding. While support was not defined specifically, it seemed to imply emotional support. The father was identified as a key member of the social network, potentially offering either positive or negative breastfeeding social support.

Kessler, Cielen, Diener-West, and Paige (1995), in a sample of women from Baltimore, Maryland, studied the influence of the significant other on breastfeeding. The mothers in the sample were 74% black and 26% white. The significant other was defined as the person whose opinion matters the most, as identified by the mother. In this sample 71% of the respondents identified the infant's father as the significant other, and 29%

identified the infant's maternal grandmother. The quality of the influence of these individuals was measured by asking them about their attitudes and preferences about breast or formula feeding. McIntyre et al. (2001) in a sample of women in a low socioeconomic area of Australia surveyed the attitudes of mothers, fathers and grandmothers, as well as members of the community, about breastfeeding. They defined social support for breastfeeding as being emotional and physical assistance for breastfeeding provided by the woman's social network, although what was measured was characteristics of the social network, i.e. the attitudes of different individuals about breastfeeding. They found little social support for breastfeeding in the sample, citing this as a barrier to breastfeeding (McIntyre et al.). Both of these studies actually described the characteristics of the most significant people in the social network with regard to breastfeeding, and their potential or likelihood of social support for breastfeeding, rather than the act of support itself.

Dennis et al. (2002) studied peer support for breastfeeding in a randomized, controlled trial, using a sample of primiparous mothers recruited from two community hospitals in Toronto, Canada. The peer counselors were not initially members of the woman's social network, but were volunteers who provided telephone-based breastfeeding support. Such support included informational, appraisal and emotional support for new mothers. The intervention was intended to modify the social network of a new mother by including a peer to provide support for breastfeeding. Mothers who received the peer support intervention were more likely to be breastfeeding exclusively at 3 months postpartum, and were satisfied with their infant feeding method (Dennis et al).

*Public perception of breastfeeding.* Women are frequently concerned about how they will be perceived if they breastfeed in public places (Riordan, 1998), and this may influence breastfeeding behavior. In a qualitative study exploring duration of breastfeeding in low-income mothers in the South West of England (no race or ethnicity was reported for these 10 women), Hawkins and Heard (2001) reported that women felt embarrassed to breastfeed, which made it difficult and inconvenient to continue.

Guttman and Zimmerman (2000) reported similar results in a study of low-income women, who felt that there was a social disapproval of breastfeeding in public. This was true for both breastfeeding and formula feeding mothers in this sample. The sample included a total of 154 mothers in a U.S. urban setting, 33.8% of whom were black, 27.9% Hispanic, and 15.6% white. The data were collected by structured face-to-face interviews (Guttman & Zimmerman).

In a study of the influence of parental attitudes toward breastfeeding, Scott et al. (2004) included in their measurement of attitudes a question about whether women should breastfeed in public places. In this convenience sample of 108 women recruited from maternity clinics in Glasgow, Scotland, women with more positive attitudes toward breastfeeding reported that it was acceptable to breastfeed in public, and positive attitudes predicted the choice to breastfeed. No race or ethnicity data were reported for the participants (Scott et al.).

In a study of public perceptions of breastfeeding constraints, Li, Fridinger, and Grummer-Strawn (2002) reported that 27% ( $N = 2,369$ ) of adults responding to the Healthstyles 2000 national mail survey agreed that breastfeeding in front of others was

embarrassing. This sample included 79% white and 9.5% black respondents. The percentage of black and white respondents who agreed with the statement that breastfeeding in front of other was embarrassing was similar for whites (26.3%) and blacks (25%). Not being able to comfortably breastfeed in front of others constrains the practice of breastfeeding and could be expected to be a negative influence on both breastfeeding initiation and pattern, as breastfeeding mothers would be more likely to use bottles when in public. Black women are particularly vulnerable to censure for breastfeeding in public, because of a historical, racist legacy of black women being considered promiscuous and immoral (Davis, 1981).

Recent local news could easily reinforce a woman's concern about breastfeeding in public. In November of 2006, a woman in Vermont was asked by a flight attendant to leave an airplane because she was nursing an infant, sparking a protest by nursing mothers in several city airports, and a reprimand to the flight attendant (Curran, 2006; Mishra, 2006). In order to ensure that mothers can breastfeed their infants in public places, most states have enacted laws which protect the right of women to breastfeed in whatever location in which she has a right to be (Barber, 2005). Such a law has not yet been passed in Massachusetts.

Dennis (2003) included an item in the Breastfeeding Self-Efficacy Scale about being comfortable breastfeeding when family members are present. This suggests that being comfortable breastfeeding in front of others is a factor influencing breastfeeding confidence, which Dennis defines as breastfeeding self-efficacy.

*Health care provider influences.* Although demographic and personal factors contribute significantly to the variation in breastfeeding rates and patterns, there is some evidence that health care providers also influence breastfeeding decisions. DiGirolamo, Grummer-Strawn, and Fein (2003) analyzed data from the Infant Feeding Practices Study, a longitudinal mail survey with 1,620 women, beginning prenatally and continuing to 12 months postpartum. They used data from the prenatal, neonatal and two month questionnaires. This sample was predominantly (96%) white and only 1.9% black. The results of this analysis showed that when mothers perceived that hospital staff had no preference for breast feeding over bottle feeding, they were more likely to stop breastfeeding by six weeks postpartum. There was no significant influence on breastfeeding if the physician had no preference. However, the percentage of women who intended to breastfeed for a longer duration was higher among women who perceived their physician favored breastfeeding, compared to those who perceived their physician as favoring formula, or having no preference (DiGirolamo et al.).

Lu, Lange, Slusser, Hamilton, and Halfon (2001) conducted a telephone survey of 1,229 women which over sampled black and Hispanic parents, using census-tract data for data on race and ethnicity. The sample included 73% white women, 13% black women and 14% Hispanic women. Based on these data, Lu et al. found that women who were encouraged to breastfeed by their physicians or nurses were more likely to breastfeed, regardless of their social or ethnic background.

Taveras et al. (2004), using a sample of low-risk mothers recruited from a large specialty group practice in greater Boston, conducted a telephone survey of 288 mothers



who were breastfeeding at 4 weeks postpartum. The data were linked with that of their obstetric and pediatric clinicians' responses to a mail survey about the management of and their opinions about breastfeeding. The sample included 62% white, 13% black, 11% Hispanic, 7% Asian and 7% multiracial women. They reported that if a pediatric provider recommended formula supplementation, women were more likely to have discontinued exclusive breastfeeding by 12 weeks, with this effect being more significant for black women.

### Breastfeeding in Black Women

#### *Cultural Influences on Breastfeeding*

In addition to the statistical information on racial differences in breastfeeding rates, there are studies which describe the experience of breastfeeding for black women. Ludington-Hoe, McDonald, and Satyshur (2002) reviewed the current literature with the intention to describe cultural beliefs about breastfeeding for African-American women, and to identify the reasons for the disparity in breastfeeding. They reported that breastfeeding was not viewed positively among African-American women, and that early formula and cereal supplementation was common. Breastfeeding in public was also perceived negatively. The most important people to influence breastfeeding were the other women in the social network, especially the infant's maternal grandmother. Having breastfeeding role models increased breastfeeding rates significantly (Ludington-Hoe et al.).

Corbett (2000) conducted a study using an ethnographic field design, with unstructured interviews to explore infant feeding style of 10 black women from low-

income households in the Southeastern United States. The country of origin of the women was not reported. They were first interviewed when their infant was 2 weeks old, monthly until the infant was 6 months old, and then at 9 and 12 months of the infant's age. Formula feeding and early introduction of solid food were seen as necessary because of the belief that milk alone could not satisfy an infant, and that crying was a sign that the baby was still hungry. Holding a baby when s/he cried was seen as "spoiling", so feeding was the strategy used to stop with crying without "spoiling". Breastfeeding was not considered positive, so the women who chose to breastfeed were attempting a new behavior, but did not have knowledge or support from their social environment. Bottles were also used when a mother needed to feed her infant when others were present, as breastfeeding was seen as a private behavior (Corbett).

Other qualitative studies describing the experiences of black women focused on low-income women. Raisler (2000) conducted focus groups with nursing mothers who participated in the WIC program in Michigan. Participants were recruited by breastfeeding peer-counselors available through the WIC program. All but two of the women were currently breastfeeding, and the groups included black, white and multiracial women. No ethnic information such as country of origin was reported. The women described both positive and negative experiences of support from health care providers. They experienced ambivalence about the physical bond of nursing, worrying about whether they were too protective or reluctant to leave the baby. They found the need for modesty to be a major problem. They agreed that returning to work made

breastfeeding much more difficult, and most weaned the infant prior to returning to employment (Raisler).

Underwood et al. (1997) conducted focus groups with African-American women with household incomes under the poverty level, from a central city community of Wisconsin. These women acknowledged the belief that breastfeeding was the best infant feeding method, but most bottle-fed their infants. Whether the infant was bottle or breast-fed, they believed that infants should receive cereal supplementation as early as two weeks of age, even though their health care providers discouraged this practice. They learned about infant feeding practices primarily from the advice and experience of family and community members. Formula feeding was also the norm for a sample of African-American or Caribbean American women enrolled in WIC in the metropolitan New York area (Cricco-Lizza, 2005).

Although the experiences of the women studied were similar, using only low-income women in these studies makes it difficult to distinguish the influence of race/ethnicity from the influence of socioeconomic status. Little is known about the influence of a variety of demographic factors on breastfeeding for black women. Studies identifying predictors of breastfeeding behavior have largely been done with samples of predominantly white women of moderate incomes. One survey conducted with a random sample of black mothers from 48 states (Timbo, Headrick, & Klontz, 1996) found that breastfeeding rates in black women increased with increasing age, education and income, which is also noted in studies with white women. These results suggest that values and beliefs about infant feeding are influenced by the cultural and social environment. Being

black may represent aspects of the cultural environment which have an influence on breastfeeding, but the nature of the relationship is not clear. More research is needed with samples of black women with sufficient variation in age, socioeconomic status, ethnicity and employment status in order to accurately describe racial influences on breastfeeding behavior.

### *Health Professional Influence on Black Women*

There is some evidence to suggest that black women do not receive the same amount of encouragement to breastfeed as white women. Beal, Kuhlthau, and Perrin (2003) in a study of prenatal advice given by physicians and WIC counselors, reported that black women were less likely than white women to report having received advice to breastfeed from their medical providers, in spite of evidence that such advice is equally as effective in promoting breastfeeding for both groups. These results differ from those reported by Lu et al., (2001). In their nationally representative sample of 1,229 women, of whom 13% were black, respondents did not report a difference in provider encouragement to breastfeed. However, 70% of white and Hispanic women initiated breastfeeding, in contrast to 41% of the black women in the sample (Lu et al.). Bentley et al. (1999), in a study of black, African-American women eligible for WIC recruited from four prenatal clinics in Baltimore, Maryland, found that the opinion of the woman's doctor was significant in predicting whether she intended to breastfeed. In this sample, 43.3% of the women reported that they intended to breastfeed. No information about ethnicity or country of origin was reported for the women in this sample.

*Gaps in Current Knowledge on Breastfeeding in Black Women*

The current literature about breastfeeding in black women includes studies which for the most part sample only small percentages of black women, epidemiological studies describing the breastfeeding practices of black women or qualitative studies describing the effect of culture on breastfeeding in black women. There are few studies which examine modifiable factors which may influence breastfeeding behaviors in black women. Most studies using samples of predominantly black women include only low-income women, making it difficult to distinguish the effect of race from the effect of socioeconomic status. In addition, descriptive information about ethnicity, such as country of origin, is not included in studies of black women, although it appears that this information would be significant as an influence on breastfeeding practices (Bonuck et al., 2005). Although it is clear that as a whole, black women have low rates of breastfeeding initiation, duration and exclusivity, it is much less clear as to the reasons for the disparity. In order to plan effective, culturally sensitive interventions to increase breastfeeding, more information is needed about variables that contribute to breastfeeding practices in diverse groups of black women, especially variables that are amenable to intervention. One such variable that may be useful is maternal breastfeeding self-efficacy.

## Theoretical Framework

*Social Cognitive Theory*

Based on the review of the literature, maternal confidence is a factor which influences breastfeeding, and which can potentially be modified in order to encourage an increase in breastfeeding initiation, duration and a more exclusive pattern of

breastfeeding. Maternal confidence can be described as a perception of breastfeeding self-efficacy. Self-efficacy is a key concept of the psychological theory known as Social Cognitive Theory (Bandura, 1997). Self-efficacy is defined as the belief that one is able to organize and carry out the actions necessary to manage a prospective situation.

*Personal agency.* Central to the Social Cognitive Theory is the concept of personal agency. According to Bandura (2002), there are three modes of human agency. One of those modes is personal agency exercised individually. Self-efficacy is central to this mode of personal agency. The concept of personal agency presumes that an individual has the power to produce desired effects by one's own actions. One's perception of his/her own self-efficacy, or their power to accomplish the task at hand, will influence his/her behavior. This influence extends to the choices an individual makes as well as his/her behavior, motivation, perseverance and emotional experience and responses. Bandura (1997) contrasted personal agency with the idea of an individual being controlled by or reacting to the environment simply as an object rather than an agent. If a person does not believe that they have any personal control over their behavior or their circumstances, there would be little incentive to act, or to persevere in the face of difficulty (Bandura, 2002).

*Proxy agency.* The second mode of agency described by Bandura (2002) is that of proxy agency. Because individuals do not always have direct control over the circumstances in their lives, they seek to influence the world around them by the exercise of proxy agency. This mode of agency is socially mediated. In proxy agency, people

seek out and work together with others who have the resources, power, expertise or influence to accomplish the desired goal.

*Collective agency.* Bandura (2002) described the third mode of agency as collective agency. Collective agency is the shared belief that people can produce effects through collective action. Collective agency is not the collection of each individual's efficacy beliefs, but rather a group-level property. The perception of collective efficacy is a belief of individual group members, with the result that the individuals work together with shared beliefs and goals. Collective efficacy functions similarly to personal self-efficacy, in that the perception of collective efficacy will influence the goals that are chosen, motivation, perseverance and the level of vulnerability to discouragement when trying to achieve the group's goals.

*Cultural influences.* Efficacy beliefs, both personal and collective, vary across cultures (Bandura, 2002). How beliefs are developed and structured, what goals are sought and how they are achieved would be expected to differ in different cultures. Although Bandura contends that these three modes of agency are universal, these beliefs operate in the context of a complex psychosocial system. In addition, individuals bring their own personal orientation to a cultural system. Therefore, a person's behavior and beliefs are influenced by his/her culture as well as his/her own individual characteristics.

Cultures themselves are also very diverse and dynamic according to Bandura (2002). He acknowledges that there is substantial heterogeneity among individuals within a culture. Grouping individuals together based on a common regional or geographic location does not account for the differences attributable to ethnic heterogeneity. In

addition, even within a culture there are generational variations and differences based on socioeconomic status. Because many people have moved from one country to another, there is also the diversity caused by a mingling of different ethnic backgrounds, and the relative influences of an individual's own ethnic subculture with that of the larger culture of the society in which s/he now lives (Bandura).

*Relationship of personal agency and social environment.* These variations within cultural groups extend to social relationships. Members of cultures considered to be more collectivistic have close communal ties with family members, friends and colleagues. However, these ties may differ according to the activity being considered. People behave communally in some aspects of their lives, while they may behave individualistically in other aspects. Thus, the cultural orientation may be collectivistic, but this may be expressed differently under different conditions. This emphasizes that human behavior is "social situated, richly contextualized and conditionally expressed" (Bandura, 2002, p. 276). Behavior is not based entirely on personal characteristics nor is it entirely interdependent. Thus, personal agency, which is influenced significantly by one's efficacy beliefs, operates within a social structure. Individuals both influence and are influenced by the environment in which they live. The influence between the individual and the social environment is bidirectional. In this way, social cognitive theory rejects the notion that behavior is controlled entirely by the individual or entirely by the environment, but instead by a complex interaction of both the person and the social context (Bandura).



Bandura (2002) contended that social and environmental influences such as socioeconomic status, economic conditions and family structure do not affect behavior directly, but rather through their influence on an individual's sense of personal control. In the same manner, citing studies of diverse spheres of functioning, he concluded that social support influences behavior indirectly by its influence on perceived self-efficacy. In essence, he contended that self-efficacy is the mediator between these social influences and a person's behavior.

### *Self-Efficacy Concept*

Self-efficacy differs from confidence, a more colloquial term often used to describe the same concept. Confidence describes the strength of a belief, but is not necessarily specific to the object of that belief. Self-efficacy includes the concept of the strength of the belief, but also the affirmation of the capability to perform a *specific* behavior. Self-efficacy is a construct in a theoretical system, whereas confidence is a less descriptive term (Bandura, 1997).

*Sources of efficacy information.* A perception of self-efficacy is derived from information gained by four principal sources of information. While these sources are described individually, they operate together in an integrated fashion.

The first and most influential source of efficacy information is previous experiences or performance accomplishments (enactive mastery). When one is successful in a particular pursuit, self-efficacy is generally enhanced, while failing will lower a perception of self-efficacy, particularly if the failure occurs early in the course of events. However, it is not just the success or failure that influences efficacy beliefs, but

the cognitive appraisal of one's performance. Many factors can influence the cognitive appraisal of experience, including one's preconception of their capabilities, how difficult the task was/is perceived to be, the amount of effort expended, the amount of help received and the circumstances under which the action was performed (Bandura, 1997).

A second source of efficacy information is vicarious experience or modeling (Bandura, 1997). This is particularly important when a person has had little prior experience with the activity being considered. Modeling is most effective as a source of efficacy information if the person being observed is similar to oneself. What behavior is modeled depends on the value of the activity to the person observing, and who is available in the social environment to be modeled. Cultural practices are often developed through observational learning (Bandura, 2002). Thus, modeling is very culturally influenced (Bandura).

Verbal or social persuasion is another source of efficacy information. Information gained through verbal or social persuasion is most influential if the person providing the information is deemed credible and knowledgeable. In addition, the information provided is more effective if it is similar to one's own beliefs about oneself (Bandura, 1997).

Self-efficacy is also influenced by physiological responses and emotional/affective states (Bandura, 1997). Somatic information, such as pain or fatigue, can influence self-efficacy, depending on how this information is appraised. Stress and anxiety may cause a person to perceive that s/he is likely to perform poorly. Enhancing efficacy beliefs would involve enhancing physical status and reducing stress. Mood also influences self-

efficacy, as a source of affective information. Mood can influence how events are interpreted and remembered. Positive moods tend to enhance self-efficacy, while negative moods will diminish self-efficacy, especially if such moods are particularly intense.

*Specificity of self-efficacy.* Self-efficacy is not a general characteristic, but is task-specific (Bandura, 1997). A person's efficacy beliefs will differ depending on the activity being considered or attempted. A particular domain of functioning requires specific abilities. Efficacy beliefs are formed based on how well one perceives that they can perform the tasks necessary to meet a specific goal (Bandura).

*Dimensions of self-efficacy.* Efficacy beliefs differ in *level*, where one may perceive him/herself capable of only simple task demands, or of very challenging ones. Any activity undertaken requires different skills, and may also demand such qualities such as exertion, accuracy, productivity or self-regulation. In addition, these skills may be required repeatedly and under many different circumstances. People will judge themselves based on how well they believe they can perform a given pursuit based on all the activities and abilities required.

Efficacy beliefs also vary in *generality*. Individuals may see themselves as being able to succeed in a wide range of activities, or only in certain domains, depending on how similar the activities and capabilities required are perceived to be.

Efficacy beliefs also vary in *strength*. The stronger the sense of efficacy, the more likely a person is to persevere in the chosen activity and to be successful (Bandura,

1997). If one has a weak sense of self-efficacy; s/he would be more likely to give up if her/his experiences are disconfirming.

### *Self-Efficacy and Health Promotion*

Bandura (2000) elaborated on his theory with respect to health promotion by building a case for how efficacy beliefs affect health. He contended that in order to make any changes in health habits of any kind, people must have motivation and perseverance even to choose to make a change. They then will require a perception of self-efficacy in order to maintain the changes and to recover and restore control after setbacks. Knowledge of the health benefits of a particular behavior is not enough to adopt the behavior. A lifestyle change may require a sense of control over one's motivation, thought processes, emotions and/or environment. He maintained that self-efficacy affects health by this process of enabling personal changes and control over health habits, and also by the physiological benefit to the immune system provided by experiencing a sense of control over life's stressors (Bandura, 2000). Researchers have described the impact of therapeutic interventions on health behaviors as being mediated partly by self-efficacy (Bandura, 1997).

When people are considering a health-promoting behavior, there is a process that begins with the intention to perform the behavior, but must continue into planning and then performing the behavior on a regular basis. Self-efficacy has been suggested to have an influence on the entire process (Bandura, 2000). There has been a large amount of research using self-efficacy theory, and describing how efficacy beliefs influence health behaviors in a variety of settings. Self-efficacy has been studied with respect to avoidance

of sexual risk behaviors such as unprotected intercourse or resistance to sexual coercion (Bengel, Belz-Merk, & Farin, 1996), both of which require an ability to negotiate interpersonally as well as technical skills such as condom use. Self-efficacy has been useful in explaining people's behaviors to perform regular physical exercise (Wilbur, Miller, Chandler, & McDevitt, 2003) and to control their nutritional intake and body weight (Wamsteker et al., 2005), both of which require a commitment to health behaviors over a period of time. Studies of addictive behaviors such as smoking have used self-efficacy theory to explain how people resist temptation and avoid or cope with relapse (Wilson, Wallston, & King, 1990). All of these behaviors involve the choice of a particular behavior or set of behaviors to promote health, and then continuing the behaviors over prolonged periods of time.

Looking at studies of women, Dennis et al. (2001) studied weight loss treatments in postmenopausal women, and found that enhanced weight-control self-efficacy, particularly through performance accomplishment, was the most important aspect of treatment for weight loss regardless of the level of self-efficacy the respondents had upon entering treatment. Reece and Harkless (1998) addressed self-efficacy in adaptation to the parenting role, and found that for mothers, parenting self-efficacy and stress were negatively correlated. Those mothers who had a higher perception of parenting self-efficacy were less likely to be experiencing stress. The same correlation was not noted for fathers, suggesting differences in self-efficacy between genders related to parenting.

Bishop, Marteau, Hall, Kitchener, and Hajek (2005), in a study of women who had received abnormal cervical smear test results, found that self-efficacy mediated the

impact of an educational leaflet describing the threat of cervical cancer due to smoking. The leaflet only increased the intention to quit smoking for women with high self-efficacy for quitting smoking. Eddy (1993) reported that self-efficacy predicted the intent to perform breast self-examinations and mammography screening. Because self-efficacy is task-specific, there are countless other reports of the influences of self-efficacy on various health behaviors (Bandura, 2000).

While the concept of self-efficacy is a central part of Social Cognitive Theory, it has also been incorporated into other theories of health promotion, including the Theory of Planned Behavior (Ajzen, 2002), Protection Motivation Theory (Weinstein, 1993), the Health Promotion Model (Pender, 1996) and the Health Action Process Model (Schwarzer & Fuchs, 1995), highlighting the importance of the concept of self-efficacy in health promotion and health behavior. It appears that self-efficacy is important for all stages of a health behavior, including choosing, motivating oneself and performing the activity, as well as recovering from setbacks (Schwarzer & Fuchs). As interventions to enhance self-efficacy appear to be productive in promoting positive health and lifestyle outcomes (Bandura, 1997), interventions could be developed that aim to modify efficacy beliefs as a way of achieving health goals.

#### *Cultural Influences on Self-Efficacy*

Self-efficacy has been criticized as being an individualistic theory, and therefore not applicable to collectivist societies, limiting its generalizability beyond Western cultures, which are more commonly considered individualistic. However, Bandura (2001) argues that self-efficacy is important to productive functioning by individuals in both

individualistic and collectivistic cultures. He maintained that the culture shapes the way that efficacy beliefs are developed, to what purposes they are used, and in what context they are exercised. People in individualistic as well as collectivistic cultures have personal goals and while the content of those goals is likely to differ, a strong sense of self-efficacy would still contribute toward realization of those goals (Oettingen, 1995). Oettingen wrote that self-efficacy beliefs are formed by appraising information from multiple sources, and the culture is likely to influence the type of information received from those sources, what is selected and valued and how it is then integrated into a person's judgment of his/her self-efficacy. In order to understand the link between culture and self-efficacy, one must observe the social transactions of the specific culture of interest because the social transactions would mediate the effect of culture on self-efficacy. Different social structures and different institutional practices would be expected to exert different effects on an individual's sense of personal efficacy.

#### *Self-Efficacy Research and Black Americans*

Studies of self-efficacy with black Americans have found self-efficacy to be predictive of various health behaviors. Bungum, Pate, Dowda and Vincent (1999) studied physical exercise among black adolescents. In this study, the instrument measuring self-efficacy was not described in detail, but they did find that self-efficacy was a robust predictor of physical activity. Diehl, Lewis-Stevenson, Spruill, and Egan (2001) studied readiness to change cardiovascular risk behaviors in a sample of women attending the 1999 National Black Nurses Association annual meeting. Self-efficacy was measured using an instrument that measured perceived ability to be physically active when faced

with barriers, and an instrument to measure readiness for physical activity. Higher self-efficacy was generally associated with stages of readiness to increase physical activity, with women in a more advanced stage of readiness having increased self-efficacy for physical activity. Interestingly however, women who were in early stages of readiness to change, such as precontemplation, had higher levels of self-efficacy than those who were in contemplation or preparation stages. By definition, being in the precontemplation stage of change means that there is no current intent to change behavior (Velicer, Prochaska, Fava, Norman, & Redding, 1998). The measure of self-efficacy in this study was the perception of the ability to be active when faced with barriers. Without intent to change, it is difficult to interpret the meaning of a perception of self-efficacy to overcome barriers. In the contemplation and preparation stages, there is intent to change, and active consideration of what is required in order to change a behavior. Increasing stages of readiness to change (excluding precontemplation), moving from contemplation to preparation and then to action, were associated with greater self-efficacy for physical activity (Diehl et al.). Self-efficacy perceptions are formed based on an individual's belief in how capable s/he is and how well s/he will be able to perform the activities required to reach a desired goal (Bandura, 1997). Measurement of self-efficacy would be more salient in the context of a person actually considering and actively planning to make a behavior change, such as in the case of women considering an increase in physical activity. Diehl et al. did find that once participants were actively considering an increase in physical activity, higher levels of self-efficacy were found in groups at more advanced stages of change, suggesting that people who are making efforts to increase physical



activity may be more aware of barriers than those who have chosen not to be physically active.

For some behaviors, what is required for success is not a perception of self-efficacy to perform the desired behavior, but self-regulatory self-efficacy. Self-regulatory self-efficacy is the belief that one can perform an activity in the face of obstacles that could interfere with one's efforts to succeed (Bandura, 1997). Diehl et al. (2001) measured self-efficacy in overcoming barriers to exercise in participants considering or planning to increase physical activity, which is likely to have been a measure of self-regulatory self-efficacy.

Martin, Dutton & Brantley (2004) studied overweight, low-income black women participating in a weight loss program. Participants were assigned to either a standard care (control) group or a treatment group. Women in the treatment group received six monthly, 15-minute appointments with their physician. Each session used a standard generalized format, and one of the sessions was focused on increasing self-efficacy by teaching the participants how to resist eating in certain difficult situations. Women in the control group received the usual obesity management provided by their physician during an office visit, and were seen only for regular medical care. Surprisingly, women with a high level of self-efficacy prior to treatment lost less weight. However, women whose self-efficacy increased during the treatment lost more weight. The finding that high self-efficacy preceding treatment had a negative effect on weight loss was unexpected and unexplained, but it was postulated that perhaps the respondents with high self-efficacy were over-confident in their abilities because they had less experience with the

experience of attempting to lose weight. The findings of Martin et al. support the contribution of performance accomplishments (Bandura, 1997), in this case, losing weight during the treatment, in the development of self-efficacy perceptions. In addition, participating in the treatment may have enhanced participant's self-efficacy through verbal persuasion and modeling. Prior to treatment, women may have had high *levels* but not strong self-efficacy, and thus it was readily diminished by any negative or disconfirming experiences (Bandura). This would have been the case if they did not lose weight, or found the treatment to be more difficult than anticipated. In this study, self-efficacy prior to the treatment was not predictive of weight loss. However, women participating in the treatment group, who received an intervention aimed at improving self-efficacy, did have increasing levels of weight loss self-efficacy over the treatment, and did lose more weight than those who received standard care.

Bandura (1997) described a number of conditions that might create a disparity between efficacy beliefs and behavior. This disparity could be caused by an inaccurate assessment of one's own abilities or the demands and skills required for the task being considered. Women who were being encouraged to or were considering losing weight may have higher self-efficacy because they did not truly appreciate the effort involved in losing weight and the barriers that might be encountered.

Sharma, Sargent, and Stacy (2005) studied physical activity self-efficacy in a sample of 240 black women recruited from the reception area of various health centers and churches in Nebraska. The only inclusion criterion was that the women be of African-American descent, ages 18 or above, and willing to participate in the study. They

found that physical activity self-efficacy and the frequency of social support from friends predicted participation in leisure time physical activity (Sharma et al.). In this study, both self-efficacy and social support from friends were predictors of leisure time physical activity.

In each of these studies with samples of black Americans, higher levels of self-efficacy had a positive relationship to the health outcomes being measured, and in general, higher levels of self-efficacy predicted the more desirable outcomes. This is consistent with prior research linking higher levels of self-efficacy with positive changes in health behaviors (Bandura, 1997).

#### *Comparisons of Self-efficacy in White and Black Women*

The research cited previously examined the role of self-efficacy in health promoting behaviors in samples of black Americans. In two studies, comparisons between racial groups on self-efficacy were analyzed. Bungum et al. (1999) studied correlates of physical activity in black and white female adolescents. The sample included 852 females between the ages of 14 and 18 who were living in South Carolina and attending one of eight public schools, and was comprised of 74% African-American adolescents, which Bungum et al. noted was a greater proportion of African-Americans than that of the South Carolina population. Data were collected on 25 constructs using an 81-item survey instrument. An 8-item self-efficacy scale was used as part of a measure of cognitive variables hypothesized to predict exercise behavior. Self-efficacy was a significant predictor of moderate physical activity in both groups; however it was only

significant for intense physical activity in white female adolescents. Barriers to activity predicted less intense physical activity in whites but not blacks.

In the study by Bungum et al. (1999), the beta weight of the effect of self-efficacy was different for each group, with self-efficacy having a significantly greater relationship on the outcome for whites than for blacks. Family support was a significant predictor of moderate activity among the black adolescents sampled, but not for white adolescents. Based on self-efficacy theory, family support may have influenced self-efficacy, and thus there may be some correlation between the variables of self-efficacy and family support which was not measured and/or reported. Self-efficacy and barriers to activity would also be expected to be related based on theory, as one's perception of self-efficacy will influence how one perceives and manages obstacles. This may suggest some differences in sources of efficacy information between black and white individuals, with family support being more significant for blacks, and barriers to exercise being more significant for whites.

In a study comparing determinants of physical activity and adherence to a walking program in white and black women, Wilbur et al. (2003) found that self-efficacy was high for both groups at the beginning of the walking program, but higher for the black women. Previous exercise experience had a negative effect on adherence for both groups. Self-efficacy for exercise predicted greater adherence to the program. Interestingly, self-efficacy scores for both groups decreased over the 24-week period of intervention, but the change in self-efficacy was only significant for the black women. Intrinsic motivation to exercise increased significantly for the white women only. Higher self-efficacy may have

influenced the decision of women to enter the program, but self-efficacy may have decreased with the experience of attempting to overcome barriers to maintaining a regular activity. Although this study suggests that self-efficacy is an important variable in predicting exercise behavior, it also suggests that self-efficacy may be influenced by different factors for white and black women. This would be consistent with Bandura's (2001) and Oettingen's (1995) opinion that culture, which might include social interactions and institutional influences, would influence the efficacy information that a person receives and how s/he appraises and integrates that information into his/her efficacy perceptions.

Although there are few studies comparing self-efficacy perceptions of racial groups, these two studies (Bungum et al., 1999; Wilbur et al., 2003) suggest that while self-efficacy is an important variable influencing various health outcomes, sources of efficacy information may be different for different racial or cultural groups. Thus, the concept of self-efficacy would be useful for predicting health behaviors in diverse groups, while recognizing that self-efficacy perceptions are likely to be informed by sociocultural influences such as race and social interactions. As breastfeeding an infant can be considered a health behavior, self-efficacy theory is likely to be fruitful for helping to explain breastfeeding behaviors.

#### *Self-efficacy and Breastfeeding*

*Defining breastfeeding self-efficacy.* Based on Bandura's (1997) theory, breastfeeding self-efficacy is a mother's belief that she will be able to organize and carry out the actions necessary to breastfeed her infant. Such actions include the techniques of

getting the infant latched on to the breast comfortably and establishing a sufficient milk supply, as well as managing the psychological and social aspects of incorporating breastfeeding into one's lifestyle, coping with various challenges and establishing a support network.

*Sources of breastfeeding self-efficacy information.* Enactive mastery experience, the experience of success, is an important source of efficacy information based on self-efficacy theory (Bandura, 1997). It might be expected then, that women who had a prior positive breastfeeding experience would have higher breastfeeding self-efficacy than those without any breastfeeding experience. Although greater parity (having had previous children) has been inconsistently associated with breastfeeding initiation (Scott & Binns, 1999), this is likely to be related to varying perceptions of whether or not prior breastfeeding experiences of breastfeeding were judged to be successful. If previous experiences were successful, this would increase self-efficacy because of an experience of past mastery (Bandura, 1997). Prior research measuring breastfeeding self-efficacy (Creedy et al. 2003; Dennis & Faux, 1999; Dennis, 2003; Torres et al., 2003; Wutke & Dennis, 2006) has consistently found that women with previous breastfeeding experience have higher breastfeeding self-efficacy than those who do not have any breastfeeding experience.

Vicarious experience, or the observation of the experience of others, is also a source of efficacy information (Bandura, 1997), and most influential when the individual being observed is judged to be similar to oneself. This role modeling is particularly important if one has little direct or personal experience, as would be the case in

primiparas. Dennis's (2006) findings that support from women with children predicted higher self-efficacy is consistent with self-efficacy theory (Bandura).

Although not measuring breastfeeding self-efficacy directly, Dennis et al. (2002) studied the effect of peer support on breastfeeding duration in a sample of 256 mothers from a semi-urban setting near Toronto. The women were randomly assigned to a control group which provided conventional breastfeeding support or to an experimental peer support group. Those in the peer support group were contacted by a lay volunteer member of a breastfeeding support organization within 48 hours after delivery and thereafter as the mother and peer supporter deemed necessary. More mothers in the peer support group were breastfeeding at each follow-up period of 4, 8 and 12 weeks postpartum, compared to mothers in the control group, even after controlling for all baseline demographic variables (Dennis et al.). These peer supporters were not part of the women's social network prior to birth, but were women similar to the study participants who had breastfeeding experience. Bandura (1977) wrote that verbal or social persuasion is most influential if the person providing the information is judged to be knowledgeable and credible. This would be the case in women providing peer support who had successfully breastfed an infant and were members of a breastfeeding support organization. The women providing support could also influence breastfeeding self-efficacy as role models and sources of vicarious experience.

Pugh, Milligan and Brown (2001) reported on a quasi-experimental pilot study of breastfeeding support. The sample included 20 women, 10 in the intervention group and 10 in control group (usual care), who were matched on type of delivery, previous

breastfeeding experience and race. All of the women were low-income, and 30% were black. They were recruited during the postpartum hospitalization, and follow-up data were collected at 1, 2, 3, 4 and 6 weeks postpartum, as well as at 4 months postpartum. The women in the intervention group had a breastfeeding support team, consisting of a community health nurse and a peer counselor, which included a nurse visit during hospitalization and at least three home visits during the first month. In addition, peer counselors visited and provided telephone support twice weekly until eight weeks postpartum, and weekly through five months postpartum. All of the women receiving the intervention were breastfeeding at each of the time periods, and reported less breastfeeding problems. The success of such interventions involving peer support suggests the importance of verbal persuasion and vicarious experience as sources of breastfeeding self-efficacy information.

Social persuasion helps to strengthen and sustain existing efficacy beliefs, particularly when difficulties arise that may challenge one's sense of efficacy (Bandura, 1997). The influence of social persuasion on breastfeeding self-efficacy has not been measured directly. However, social/verbal persuasion could also be understood as advocacy, described as motivating and empowering others to act on their own behalf, and encouraging them to maintain control (Finfgeld-Connett, 2005). A strong sense of self-efficacy could be described as being empowered or feeling in control, and according to Bandura (1997), efficacy beliefs influence motivation. Social persuasion in the form of advocacy would then be likely to influence self-efficacy. Finfgeld-Connett described advocacy as an important aspect of social support, which is enhanced when the provider



and the recipient of the social support share common demographic, sociocultural and religious backgrounds, as well as shared similar experiences. This is consistent with Bandura's concept of the role of vicarious experience and social/verbal persuasion in the development of a perception of self-efficacy.

Physiological and affective states also inform self-efficacy (Bandura, 1997).

Dennis (2006) measured maternal characteristics that predict breastfeeding self-efficacy, including personality style, life stressors, satisfaction with postpartum pain relief, mood and anxiety. Women who were depressed or anxious had lower breastfeeding self-efficacy scores. Self-efficacy scores were also lower in those who reported experiencing more stress. Women reporting greater satisfaction with their postpartum pain relief had higher levels of breastfeeding self-efficacy. These findings support the influence of physiological and affective states on perceptions of self-efficacy. It is possible that the differences noted in breastfeeding self-efficacy between mothers who delivered vaginally and those who had a cesarean birth (Dennis, 2003) may occur because of the experience of post-operative pain and recovery, as well as disappointment over an unexpected outcome of surgical birth.

*Measuring breastfeeding self-efficacy.* Dennis and Faux (1999) studied breastfeeding self-efficacy using an instrument they developed called the Breastfeeding Self-Efficacy Scale (BSES). This measure is based on Bandura's (1997) self-efficacy theory and the breastfeeding literature, and includes three concepts related to successful breastfeeding—technique, intrapersonal thoughts, and support. Technique is described as the physical actions and tasks required for successful breastfeeding. Intrapersonal

thoughts are the mother's attitudes, beliefs and perceptions about breastfeeding, and support is described as the assistance the mother perceives is available to help her breastfeed successfully (Dennis & Faux).

Breastfeeding self-efficacy measured by the BSES was studied with a convenience sample of 130 Canadian women (Dennis & Faux, 1999). Women completed the instrument during their postpartum hospitalization, and then were telephoned at 6 weeks postpartum to determine their infant feeding pattern at that time. The respondents were classified into three groups based on infant feeding pattern—exclusive breastfeeding, combination feeding and exclusive bottle feeding. A significant difference was found in the self-efficacy scores of each of the three groups of women. A post hoc procedure was performed, and a significant difference was found in self-efficacy scores between women who were exclusively breastfeeding and those who were exclusively bottle feeding. The higher the postpartum BSES score, the more likely a woman was to be breastfeeding exclusively at 6 weeks postpartum (Dennis & Faux). Breastfeeding self-efficacy scores were higher in women with breastfeeding experience as compared to women without experience, confirming the importance of the experience of past mastery in developing a perception of breastfeeding self-efficacy. The women in this sample were primarily Caucasian (92.5%), married (90%) and well-educated (mean 14.6 years). The mean age of the respondents was 28.7 years. As six-month maternity leaves are common in Canada, working outside the home was not a confounding factor for breastfeeding duration (Dennis & Faux). This initial study using the concept of breastfeeding self-efficacy showed the significance of breastfeeding self-efficacy to breastfeeding duration and

pattern. However, the sample of well-educated white women were representative of a group already known to have high levels of breastfeeding.

In a longitudinal study with a sample of Australian women, higher levels of breastfeeding self-efficacy predicted the duration of breastfeeding, based on the scores of the Breastfeeding Self-Efficacy Scale, when measured at 1 week and 4 months postpartum (Blyth et al., 2002). Higher levels of breastfeeding self-efficacy also predicted the level or pattern of breastfeeding, that is, the higher a mother scored on the self-efficacy scale, the more likely she was to be breastfeeding exclusively without formula supplementation. This sample included 300 women, 86% of whom were Caucasian, 4% Australian aboriginal, 4% Asian, and 6% were other ethnic minorities. The sample included both primiparous and multiparous women, but the percentages of each were not reported. The mean age of the respondents was 28.5 years. Eighty-eight percent of the sample was married, and all had at least a high school degree or higher. Only 33% of the sample did not work outside the home; however, Australia has a one year maternity leave provision, so returning to work was not a confounding factor for breastfeeding duration. The most common reason given for changing the infant feeding method was insufficient milk supply, with 8% of women reporting insufficient milk at 1 week postpartum, and 24.9% of women reporting insufficient milk supply at 4 months postpartum. An additional 21.5% of the women reported that they had begun to start solid food feeding at 4 months postpartum which accounted for the change in infant feeding patterns (Blyth et al. 2002). Blyth et al. also reported that there was a consistent increase in mean scores of breastfeeding self-efficacy over time. Self-efficacy scores recorded prenatally were

significantly different between women who were breastfeeding and those who were formula feeding at 4 months postpartum. The self-efficacy scores recorded at 1 week postpartum were also found to be significantly different in mothers who at four months were breastfeeding or those who were formula feeding. Using a hierarchical regression model, it was determined that maternal demographic factors accounted for 24% of the variance in breastfeeding duration, and that prenatal breastfeeding self-efficacy scores accounted for an additional 3% of the variance. When using the breastfeeding self-efficacy scores measured at one week postpartum, however, self-efficacy accounted for 9% of the variance in breastfeeding duration (Blyth et al.), which suggests that self-efficacy perceptions in the postpartum period are more predictive of breastfeeding behaviors than those measured prenatally. Self-efficacy scores were assessed in relation to the maternal demographic factors of age, marital status, education and race/ethnicity, and there were no significant differences between groups based on these factors. There were significant differences in breastfeeding self-efficacy between primiparous women and multiparous women, and these were consistent over each of the three measurement points—prenatal, one week postpartum and four months postpartum. Reporting on the psychometric characteristics of the BSES in the same sample, Creedy et al. (2003) found that the item related to support in the self-efficacy instrument did not load during a factor analysis of the instrument, suggesting that support in this sample did not relate to breastfeeding self-efficacy once a mother had decided to breastfeed.

The BSES was also translated into Spanish, and used with a sample of 100 Puerto Rican women recruited from a private hospital in San Juan (Torres, Torres, Rodriguez, &

Dennis, 2003). Women were eligible to participate in the study if they were 18 years of age or older, able to read and speak Spanish, and at least 37 weeks gestation when they gave birth. In this sample, the mean age of the respondents was 27 years old, 73% were married and the mean educational level was 14 years. Forty-one percent of the sample worked full-time, 17% worked part-time, and 42% did not work outside the home. The BSES was administered prior to hospital discharge. After completing the questionnaires, the respondents described their current breastfeeding behavior. Because both the breastfeeding pattern and the self-efficacy score were measured at the same time postpartum, predictive validity could not be established. However, self-efficacy scores were higher for women who were exclusively breastfeeding (44% of the sample) in the hospital than for those who were breastfeeding with some form of supplementation (56% of the sample). Fifty percent of the sample was multiparous. Multiparous women with breastfeeding experience (56% of all the multiparous women) had higher self-efficacy scores than women with no previous breastfeeding experience. Again, the item about family support did not load in a factor analysis (Torres et al.).

The BSES was translated into Mandarin and administered to a sample of 186 breastfeeding Chinese women in Tianjin City, China (Dai & Dennis, 2003). Participants entered the study at 3 - 5 days postpartum. They completed the BSES and described their current breastfeeding pattern at that time. Most participants were discharged by 4 days postpartum. Telephone follow-up was conducted at 4 and 8 weeks postpartum. Significant differences were found in the breastfeeding self-efficacy scores recorded during the postpartum hospitalization for mothers who were breastfeeding and mothers

who were bottle feeding at both 4 and 8 weeks postpartum. When mothers were categorized according to their breastfeeding level (exclusive breastfeeding, combination feeding or exclusive bottle feeding), mothers who were exclusively breastfeeding had higher mean BSES scores than those who were combination feeding or exclusively bottle feeding. The difference was statistically significant between scores of mothers who were exclusively breastfeeding and those who were exclusively bottle feeding. These differences persisted at the 8 weeks measurement point. In this sample, the mean age was 27.76 years, and most (94%) had completed at least a high school education. Eighty-four percent of the sample worked outside the home.

The BSES was translated into Polish and administered to a convenience sample of 105 women during their postpartum hospitalization at one of five urban hospitals in Lodz, Poland. Follow-up of infant feeding status was conducted at 8 and 16 weeks postpartum via a telephone interview. Women in the study had a mean age of 28, and more than half (58.1%) had some postsecondary education. Most of the mothers (74.3%) had no previous breastfeeding experience. Self-efficacy scores were significantly higher in mothers who were breastfeeding than mothers who were formula feeding at 8 weeks postpartum. Significant differences were also found between mothers who were exclusively breastfeeding, those who were partially breastfeeding and those who were formula feeding, with the higher levels of self-efficacy in mothers who were breastfeeding more exclusively. These differences persisted at 16 weeks postpartum (Wutke & Dennis, 2006).

While research suggests that breastfeeding self-efficacy influences breastfeeding behavior in women in diverse samples, most samples were of relatively well-educated women. Education is a demographic variable already known to be positively associated with breastfeeding. Breastfeeding self-efficacy has not been measured in samples of black women, or in groups of women who are more socio-economically disadvantaged.

### Summary of the Literature

Breastfeeding is an important aspect of health promotion for mothers and infants. The amount of breastfeeding, both in terms of duration and pattern (exclusive breastfeeding or a combination of breastfeeding and formula), appears to be important in determining the significance of the health benefits. However, both breastfeeding duration and amount of breastfeeding are the lowest for black women as compared to any other racial groups in the United States.

Breastfeeding has the potential to provide significant health benefits to black women and their infants. Health problems such as heart disease, high blood pressure, diabetes, asthma and obesity are overrepresented among blacks, and breastfeeding has been shown to contribute to a decreased risk of these conditions into adulthood. In addition, black infants are more at risk for preterm delivery, and breastfeeding provides significant health benefits for preterm infants, including a decreased risk of infant mortality. However, breastfeeding may not be the social norm for all black women. In order to plan breastfeeding promotion interventions that are fitted to the cultural and social norms, it is important to understand the variables that influence breastfeeding outcomes in black women.

Many demographic variables other than race influence breastfeeding, including age, education, socioeconomic status, geographic region of residence, country of origin and employment outside the home. However, breastfeeding rates are higher among those of higher socioeconomic status, and blacks are overrepresented among those of the lower socioeconomic status (Lillie-Blanton, Rushing, & Ruiz, 2003), making it difficult to separate the effects of race and socioeconomic status.

Maternal variables including attitudes about breastfeeding, perception of milk supply and maternal confidence have been shown to influence breastfeeding. The social context, including the public perception of breastfeeding and cultural influences, also influences breastfeeding behavior. Based on national statistics (DHHS, 2002) breastfeeding is not the norm for many black women, and cultural practices such as early supplementation with formula and solid food are common (Ludington-Hoe et al., 2002). These practices have been shown to decrease breastfeeding duration. In addition, there may be disparities in whether breastfeeding is encouraged as much for black women as it is for white women. All of these factors contribute to the low breastfeeding rate for blacks. Many variables influencing breastfeeding for black women and infants are not modifiable, at least on an individual level. Interventions designed to improve self-efficacy have been shown to have a positive influence on other health behaviors such as managing chronic illness or improving parenting self-efficacy. Maternal confidence, defined and measured more specifically as breastfeeding self-efficacy, may be a modifiable variable which could positively influence the rate and duration of breastfeeding for this more vulnerable population.



Self-efficacy is a useful concept in explaining various health-promoting behaviors. Self-efficacy predicts behavior, and it also influenced by culture. Breastfeeding is a health behavior requiring a variety of physical, intrapersonal and social skills to be successful. Self-efficacy is situation or task-specific. Breastfeeding self-efficacy has also been shown to have utility in predicting breastfeeding duration and pattern, but it has not been studied in black women.

## CHAPTER II: METHODOLOGY

### Research Questions and Hypotheses

The purpose of this study was to examine the relationship of self-efficacy to breastfeeding duration and pattern in a sample of black women. The following research questions were addressed:

1. Does breastfeeding self-efficacy immediately postpartum predict  
breastfeeding duration in black women, measured at 4 weeks postpartum?
2. Does breastfeeding self-efficacy immediately postpartum predict  
breastfeeding pattern in black women, measured at 4 weeks postpartum?

Researchers have not yet determined whether breastfeeding self-efficacy is predictive of breastfeeding duration and pattern in black women. Based on what is presently known about breastfeeding self-efficacy in other populations, the following hypotheses were proposed:

1. Higher levels of breastfeeding self-efficacy immediately postpartum will be predictive of longer duration of breastfeeding in black women.
2. Higher levels of breastfeeding self-efficacy immediately postpartum will predict a more exclusive pattern of breastfeeding in black women.

### Research Design and Operational Definitions

This research was a descriptive, prospective cohort study, which is part of a larger, ongoing longitudinal cohort study in which the participants are being followed each month until the infant is six months old or until they have completely discontinued any

breastfeeding. Participants for this study were recruited during their postpartum hospitalization (Time 1) with follow-up at 4 to 6 weeks postpartum (Time 2).

Black women were defined as women who identified themselves as being of African descent, including the ethnic backgrounds of African, African-American, Cape Verdean, Haitian, West Indian/Caribbean and Black Hispanic. Breastfeeding was defined as any feedings at the breast within the past 24 hours, or if the baby had not yet been fed, the reported intention to breastfeed. The breastfeeding pattern (dose) was described as the total number of feedings the infant had received in the past 24 hours, including both the number of breast feedings and the number of complementary food or formula feedings the infant had received. Based on this information, breastfeeding pattern was then placed in one of six categories of breastfeeding, as described by Labbok and Krasovec (1990). Breastfeeding duration was defined as the number of weeks the infant was breastfed in any pattern prior to completely discontinuing any breastfeeding (weaning). Breastfeeding self-efficacy was defined as a mother's belief that she will be able to organize and carry out the actions necessary to breastfeed her infant, as measured by the Breastfeeding Self-Efficacy Scale-Short Form (BSES-SF) (Dennis, 2003).

The first data collection point (Time 1) was during the first week postpartum, at which time data were collected by self-administered written questionnaires. The second data collection point (Time 2) was at 4 to 6 weeks postpartum, at which time data were collected via phone interview. Previous researchers (Cam, Akman, Cicekci, Senel & Erol, 2004; Day & Campbell, 2003; Pinnock, Juniper, & Sheikh, 2005) have found high correlations between responses obtained by self-report, mail, telephone and interview,

except in the case of requesting sensitive information (Pridemore, Damphousse, & Moore, 2005).

### Sample

The target population for this study was black women in Massachusetts (women of African descent) who were breastfeeding their infants. This convenience sample of black women was recruited from the three maternity units of a large urban teaching hospital in Boston, Massachusetts. The inclusion criteria were as follows: English-speaking women, self-identified as being of African descent, age 18 or above, who were healthy and gave birth to singleton infants at 37 weeks gestation or greater, and whose infants were admitted to the normal newborn nursery. Women were excluded from the study if they did not speak English because not all of the instruments had been translated and validated in languages other than English, and none had been translated into languages commonly spoken by women of African descent (e.g. Portuguese, Creole or native African languages). Women younger than the age of 18 were excluded from the study, as it was expected that adolescents would experience different influences on breastfeeding than would adults (Bensussen-Walls & Saewye, 2001; Maehr, Lizarraga, Wingard, & Felice, 1993), confounding the influence of breastfeeding self-efficacy on breastfeeding duration and pattern. Because there are unique challenges to breastfeeding preterm or ill newborns (Callen & Pinelli, 2005), women with newborns who were preterm (< 37 weeks gestation) or ill were also excluded to avoid confounding. Women who had multiple births were also excluded because the unique challenges to breastfeeding multiples (Riordan & Auerbach, 1998) could influence breastfeeding self-efficacy.

Participants were recruited from January to June of 2006. According to unpublished data provided by the Massachusetts Department of Vital Statistics (2006), 327 black women who were age 18 or older, and who gave birth to singleton infants at 37 or more weeks of gestation or greater and who reported intent to breastfeed were admitted to the hospital during the recruitment period. All women who were identified by the postpartum staff as eligible were invited to participate ( $n = 261$ ). A total of 155 women (59% of those who were offered participation) completed and returned the initial questionnaires at Time 1, within the first week after birth. At Time 2, 143 women were able to be reached for follow-up and completed the questionnaires.

In this sample, the average age of the women participating was 30.4 (SD = 6.5, range 18-45). The majority of participants (68.3%) was either married or living with a partner (see Table 1). The largest proportion of respondents was African American (32.2%), followed by West Indian/Caribbean (15.8%). Most of the respondents (96.7%) had at least a high school education. Seventy-nine percent (79%) had post-secondary education, with 44% having 16 years or more. The majority was multiparous (58%) and had delivered their infants vaginally (66%). Of those who reported their incomes, the largest proportion of the sample (32%) reported a household income of \$81,000/year or higher, but more than half of the sample (54%) reported a household income of less than \$40,000/year (see Table 2). In addition, 58% of the sample reported eligibility for participation in the Women, Infants and Children program (WIC), which considers both household income and number of household members.

Comparing the current sample with all black women ( $N = 5,927$ ) giving birth in Massachusetts in 2004 (MA DPH, 2006), some significant differences were noted (see Table 1). The study sample had a significantly higher education level, and a larger percentage of the respondents were married. A larger proportion of the study sample (8.6%) identified themselves as Hispanic compared to the Massachusetts sample (1.6%). There also appeared to be some differences in the proportions of women in each ethnic category, particularly with more West Indian/Caribbean women being included in the study sample.

A majority of the respondents had worked outside the home in the year prior to their pregnancy (83%), and their incomes generally represented up to one half of the household income. While most (81%) reported having a maternity leave, only half reported having a paid leave (see Table 2). Among women who reported having a paid maternity leave, the average length of that leave was 12 weeks ( $SD = 8$ ). The majority of women (87%) had maternity leave of 12 weeks or less. Paid maternity leave was more common among women who worked full time. Most (72%) of the women who worked full time reported having a paid maternity leave, while only 32% of women working part time had a paid leave. Interestingly, of the 12 respondents who were lost to follow up, 83% had been employed full-time prior to the birth, and of those 10 women, only 3 reported having a paid maternity leave.

## Instruments

### *Demographic Data Survey (DDS)*

Demographic data were collected using an investigator-developed instrument. The DDS measured age, parity, marital status, socioeconomic status, ethnicity, source of payment for health care, education, employment status, mode of delivery, and participation in WIC.

### *Breastfeeding Self-Efficacy Scale (BSES)*

Breastfeeding self-efficacy was measured using the Breastfeeding Self-Efficacy Scale-Short Form (BSES-SF) (Dennis, 2003). The BSES-SF is a 14 item, self-report questionnaire in a Likert format where the respondents respond to each of the statements by checking a number from 1 to 5, whereby 1 = not at all confident and 5 = very confident. The items are framed positively and include statements related to breastfeeding technique as well as intrapersonal thoughts. The internal consistency of the tool, using Cronbach's alpha, was reported to be .94 (Dennis).

The Breastfeeding Self-Efficacy Scale (BSES) was originally designed as a 43-item instrument. Psychometric testing of the 43-item instrument was conducted with a convenience sample of 130 women recruited from a large teaching hospital in a midsize Canadian city. The Cronbach's alpha for the instrument used with this sample was .96. Construct validity was assessed by factor analysis, resulting in three factors (Dennis & Faux, 1999). Factor I included items representing skills and tasks necessary breastfeeding, and this factor explained 39.2% of the variance. Factor II included maternal attitudes and beliefs toward breastfeeding and this factor explained 6.4% of the

Table 1*Demographics of Sample Compared to All Black Women Giving Birth in Massachusetts*

<i>Sample</i>	<i>All Black Women Giving Birth in Massachusetts 2004<sup>a</sup></i> ( <i>N</i> = 5,927)			
	<i>n</i>	<i>%</i>	<i>n</i>	<i>%</i>
Ethnicity ( <i>n</i> = 152)				
African	15	9.87	1,014	17.11
African-American	49	32.24	2,436	41.10
Cape Verdean*	12	7.89	292	4.93
Haitian*	14	9.21	1,122	18.93
West Indian/Caribbean*	24	15.79	510	8.6
Other*(includes multiple backgrounds)	38	25.00	553	9.3
Hispanic* ( <i>n</i> = 152)	13	8.55	96	1.6
Marital status ( <i>n</i> = 152)				
Married *	74	48.68	2,677	45.20
Not married	78	51.32	3,250	54.80
Education ( <i>n</i> = 154)				
Less than 12 years*	5	3.25	669	11.29
12 years*	27	17.53	2,255	38.05
Some college	54	35.06	1,887	31.84
16 years*	42	27.27	850 <sup>b</sup>	14.34
More than 16 years*	26	16.88	264 <sup>c</sup>	4.45
Mode of delivery ( <i>n</i> = 154)				
Vaginal birth	102	66.23	Not available	Not available
Cesarean birth	52	33.77	available	
Parity ( <i>n</i> = 155)				
Primiparous	65	41.94	Not available	Not available
Multiparous	90	58.06	available	

<sup>a</sup> Massachusetts Department of Public Health (MA DPH) (2006)<sup>b</sup> College graduate – number of years of education not specified (MA DPH, 2006)<sup>c</sup> More than college - number of years not specified (MA DPH, 2006)\**p* < .05



Table 2*Economic and Employment Characteristics of the Sample*

	<i>n</i>	%
Household income ( <i>n</i> = 155)		
10,000/year or less	16	10.32
11,000 - 20,000/year	11	7.10
21,000 - 30,000/year	21	13.55
31,000 - 40,000/year	15	9.68
41,000 - 50,000/year	12	7.74
51,000 - 60,000/year	16	10.32
61,000 - 70,000/year	13	8.39
71,000 - 80,000/year	10	6.45
81,000 or more	32	20.65
Not reported	9	5.81
WIC eligibility ( <i>n</i> = 146)		
Eligible	85	58.22
Not eligible	61	41.78
Source of health insurance ( <i>n</i> = 155)		
Private insurance	97	62.58
Government-provided	58	37.42
Worked outside home in past year ( <i>n</i> = 155)		
Yes	129	83.23
No	26	16.77
Percentage of household income from mother's work ( <i>n</i> = 123)		
Less than 25%	25	20.33
26-50%	42	34.15
51-75%	33	26.83
More than 75%	10	8.13
Mother earns only income in household	13	10.57
Women reporting having a maternity leave ( <i>n</i> = 131)		
Yes	106	80.92
No	25	19.08
Women reporting having a paid maternity leave ( <i>n</i> = 131)		
Yes	54	41.22
No	54	41.22
Missing	23	17.55
Employment status at one-month postpartum ( <i>n</i> = 143)		
Not working	138	96.50
Working/school part time	4	2.80
Working full time	1	0.70

variance. Factor III included maternal activities to aid breastfeeding, and explained 5.1% of the variance. The items loading on Factor III were deleted in the revision of the instrument (Dennis & Faux). Construct validity was also assessed by comparison of contrasted groups (women with prior breastfeeding experience and women with no previous experience) and correlations with measures of the theoretically related constructs of postnatal depression (negative correlation at one week, four weeks, and eight weeks postpartum), self-esteem (positive correlation at four weeks postpartum), and perceived stress (negative correlation at one week and eight weeks). Predictive validity was determined by the relationship between breastfeeding self-efficacy measured in the early postpartum period and infant feeding method at six weeks postpartum. Significant differences were found in breastfeeding self-efficacy scores between women who were exclusively breastfeeding, combination feeding (both breastfeeding and formula feeding) and exclusively formula feeding. Based on the factor analysis, a revised version of the BSES was developed which included 33 items (Dennis & Faux).

The 33-item instrument was then administered to a sample of 300 women who were recruited from a large antenatal clinical in Australia. The respondents completed initial questionnaires during a prenatal appointment, and telephone follow-up was conducted at 1 week and again at 4 months postpartum for women who had been still breastfeeding at 1 week postpartum. The Cronbach's alpha for the BSES in this study was .96 (Creedy et al. 2003). Construct validity was assessed by factor analysis, comparison of contrasted groups (mothers experienced with breastfeeding and primiparous mothers without experience) and correlation with the theoretically-related

construct of perception of milk supply as measured by the maternal confidence subscale of the H & H Lactation Scale (Hill & Humenick, 1996). Predictive validity was determined by examining the participants' breastfeeding self-efficacy scores at 1 week and 4 months postpartum. Significant differences were found in the mean scores of mothers who were predominantly breastfeeding and those who were formula feeding (Creedy et al.).

The 33-item BSES was also translated into Spanish and administered to a sample of 100 Puerto Rican women (Torres et al., 2003), and translated into Mandarin and administered to a sample of 186 Chinese women (Dai & Dennis, 2003). The psychometric testing of the instrument was replicated in these studies.

Based on factor analysis, Dennis (2003) reduced the number of items on the Breastfeeding Self-Efficacy scale to 14, and this short form (BSES-SF) continued to have excellent construct and predictive validity as well as reliability, as described previously. All fourteen items had a factor loading  $> .65$ . There were significant mean differences in breastfeeding self-efficacy between breastfeeding and bottle feeding mothers at four weeks and eight weeks postpartum in this sample of Canadian mothers (Dennis, 2003). Items that were deleted from the previous 33-item instrument included a statement about family support and a statement about support from friends. Creedy et al. (2003) and Torres et al. (2003) have written that perceived support is important to mothers making the decision to breastfeed, but once the decision is made, support does not affect breastfeeding self-efficacy, which may explain why the support items did not perform well on the original instrument. The BSES-SF was also administered to a convenience

sample of 105 women recruited from 5 hospitals in Poland. The Cronbach's alpha for this sample was .89, and the in-hospital self-efficacy scores significantly predicted breastfeeding pattern and duration at 8 and 16 weeks postpartum (Wutke & Dennis, 2006). The internal consistency of the BSES-SF in the current study of black mothers was .94.

*Network Support for Breastfeeding (NSB)*

*Development of the NSB.* Network support for breastfeeding (NSB) was measured by an investigator-developed instrument. The instrument was designed based on previously used measures of breastfeeding support and social support, review of the literature related to breastfeeding support, clinical experience, and consultation with colleagues. It is similar to a 5-item tool utilized by Kearney, Cronenwett, & Barrett (1990), in which the respondents were asked to identify up to 5 people from whom they expected support as a new parent and then to estimate the support for breastfeeding that each might provide, rating them on a scale of 1 (negative and vocal about it) to 5 (positive and helpful). The score was calculated as a sum of the ratings. Kearney et al. evaluated this instrument during a pilot study ( $N = 19$  fathers and 29 mothers), and the test-retest reliability was  $r = .68$  (no  $p$  value was reported) over a 2 to 3 week period.

The NSB is also similar to the Norbeck Social Support Questionnaire (NSSQ) which asks respondents to identify up to 24 network members, and the amount of support they perceive to be available from the network (Norbeck, Lindsey, & Carrieri, 1981). The NSSQ has been used widely in a variety of populations and found to be valid and reliable (Gigliotti, 2002). However, the NSSQ measures support in general, rather than support

that is context-specific as recommended by Hupcey (1998). While childbirth is a normative life event (Schultz & Rau, 1985) and social support for a new mother would be expected, support for breastfeeding may or may not be available, and so must be distinguished from more general support provided to a new mother.

Based on these previously used instruments and social support theory, the NSB was developed to measure the existence and quantity of the network support available in the context of breastfeeding, and the functional quality of those relationships related to breastfeeding support for 5 to 7 individuals in the social network, as well as the professionals in the hospital and primary care setting. House and Kahn (1985) suggested that measures of support should measure two or three aspects of social relationships (for example, their existence and quantity, aspects of the structure and the functional quality of the relationships) and be limited to 10 to 15 people. The goal for using the NSB in this sample of black women was to help to determine who are the key members of the support network for these cultural/ethnic groups, how much support they might be able to provide, as well as what individuals or groups outside the close network are available to provide breastfeeding support.

*NSB Pretest 1.* The first pretest of the instrument was performed using a convenience sample of 13 white, well-educated, married women. The respondents were asked to list the 5 most significant people in their lives and to rate their level of breastfeeding support. Statistical analysis using Cronbach's alpha for 25 items (5 items for each of the 5 individuals listed) yielded a reliability coefficient of 0.87. Based on verbal feedback from this group of women, the instrument was revised to provide the

opportunity to list up to two more people who might provide breastfeeding support that were not part of the five most significant people in their network. Also based on recommendations from this group of women, two additional questions were added. One question was added to allow respondents to rate the support from the nurses in the hospital, and other was added about the support expected from pediatric care providers.

*NSB Pretest 2.* After making the revisions recommended during the first pretest, another pretest was conducted using a convenience sample of eight black women. Statistical analysis using Cronbach's alpha for 35 items (5 items for each of 5 support individuals, 5 items each for support from doctors and nurses in the hospital) yielded a reliability coefficient of .90. This was slightly higher (Cronbach's alpha = .95) when up to two additional support people were included (McCarter-Spaulding, 2005). Although the pretest groups were small, the Cronbach's alpha for the NSB in the current study ( $N = 155$ ) was similar at .91.

Respondents in both pretest groups reported that the instrument was easy to understand and complete, and was an accurate measure of breastfeeding support, thus establishing face validity. Content validity was established by evaluation and review by a group of experienced nurses with advanced degrees and a researcher with experience in instrument development. Minor revisions were made in the wording of the instrument after the pretesting, and the changes reviewed with three of the women who had initially completed the pretest, who confirmed that the new wording did not change their understanding of the meaning of the question. The instrument was then reviewed again

by several experts in social support and breastfeeding for further validation, and minor revisions were suggested.

*Description of the NSB.* In the revised NSB used for this study, respondents were first asked to report their infant feeding intention, including both pattern (exclusive breastfeeding or a combination of breast feeding and formula feeding) and intended duration. They were also asked if they themselves were breastfed, or if any of their family members have breastfed an infant, in order to elicit information about the social norms for breastfeeding. They also reported whether they had previously breastfed any other children. Women were asked about the importance of 11 different influences on their feeding decision, by making a mark in a box next to each influence, where they chose one of four answers on a Likert scale from “not important” to “very important”. These initial responses were used for descriptive information only, and were not included in the Cronbach’s alpha analysis of the instrument or in the calculation of the network support score.

After the initial descriptive information, participants were asked to identify up to five of the most important people in their lives, and then rate the level of support each provided for breastfeeding. Five questions about characteristics of breastfeeding support were answered about each important person, with the answers ranging from 0 -3 for each of the five questions. A response of 0 designated that the respondent’s perception of support from the individual identified based on that particular characteristic of breastfeeding support was ‘not at all’. A response of 1 meant “a little bit” of support, 2, “an average amount” and 3, “very much” (see Appendix A). An average level of support

from each person was then calculated. Each individual could be described as providing an average level of breastfeeding support which ranged from 0 to 3. The average level of support from the close network (up to five persons) was then calculated. In addition, participants could identify up to two additional people who were available specifically for breastfeeding support. The same scale from 0 to 3 was used to rate the level of support each of these people provided for breastfeeding, and an average level of support expected from these additional people was calculated. The support from the close network and the extended network was averaged to create a score measuring the average network support for breastfeeding for each respondent. Network support was measured at each of the two data collection points; within one week postpartum (Time 1), and at 4 weeks postpartum (Time 2).

#### *Breastfeeding Pattern and Duration*

Breastfeeding pattern was measured by asking the respondents to report how many feedings the infant received in the past 24 hours, and how many of those feedings were at the breast, as well as how many were bottle feedings (formula or expressed breast milk) or other foods (see Appendix B). This is consistent with World Health Organization protocols for collecting data on current breastfeeding practices, as it minimizes recall error (Li, Scanlon, & Serdula, 2005). The responses were then further categorized into the six categories described by Labbok and Krasovec (1990): exclusive breastfeeding, almost exclusive breastfeeding (breast milk and other fluids such as vitamins or water, but not formula), high breastfeeding (less than 1 bottle of formula/day), partial breastfeeding (at least 1 bottle of formula per day), token breastfeeding (breastfeeding for



comfort but not for nutrition) and bottle feeding with formula only (no breast milk at all). This consistency in definition allows for more accurate comparison between the findings from this study and previously published studies. Breastfeeding pattern information was collected at both Time 1 and Time 2.

Breastfeeding duration was measured by the respondent's report of when she completely discontinued all breastfeeding, and the age of the infant at that time. Breastfeeding duration was measured at Time 2 (4 - 6 weeks postpartum). Ertem et al. (2001) reported that in a sample of mothers eligible for the WIC program, there were two peak times for the termination of breastfeeding. The first was within the first week postpartum, when 25% of the mothers had discontinued breastfeeding, and the second was between 2 weeks and 2 months postpartum when another 40% had discontinued breastfeeding (Ertem et al.). Collecting data at 4 weeks postpartum allowed for enough breastfeeding experience to influence a mother's perception of breastfeeding self-efficacy. Data were collected prior to weaning for some of the respondents, and close to the time of weaning for others, allowing for the comparison of breastfeeding self-efficacy scores between those who were breastfeeding and those who had discontinued, and accurate recollection of the exact timing of weaning. Li et al. (2005) reported maternal recall of duration of breastfeeding was most accurate when recalled over a period less than three years. In this study, the period for recall was four weeks or less, enhancing accuracy.

## Procedure

### *Time 1*

The DDS, BSES-SF and NSB were compiled into one packet of questionnaires entitled “Breastfeeding Survey” for ease of administration (see Appendix A). At Time 1, in the initial postpartum period, women who met the inclusion criteria for the study were identified by the postpartum nurse caring for them. The nurse was asked to approach the woman to obtain verbal permission for the researcher to introduce the study, and provide a flyer that briefly described the study (see Appendix C). For ease of understanding, the flyer is written at a 5<sup>th</sup> grade reading level, based on a Flesch-Kincaid grade level analysis (Microsoft Word XP, Professional Version 2002, Service Pack 2).

If permission was granted, the researcher entered the room and introduced the study, informing the potential participant of benefits and risks. Women interested in participating were given the informed consent at that time (see Appendix D). Once consent was obtained, the DDS, BSES-SF and NSB (see Appendix A) were given to the participant to complete in writing. Those mothers who requested more time to consider participating were visited by the researcher at a mutually convenient time. Most women returned the packet of questionnaires when the researcher returned the following day to collect them. Questionnaires were completed at an average of 2.3 days postpartum (range 0 - 7). If the woman preferred or requested assistance in completing the questionnaires, the researcher assisted her by reading the questions and recording the answers. Only 14 women requested this option. Women were then asked to provide contact information (see Appendix E), including ways to be reached by phone, in anticipation of the second

data collection at four weeks postpartum. Women who were interested in participating, but were not able to complete the questionnaires prior to discharge, were asked to complete the contact information form, and arrangements were made for the researcher to collect the questionnaires from them at their home within the next few days, before completion of the first postpartum week. The questionnaires took approximately 20 to 30 minutes to complete.

### *Time 2*

The second data collection point was scheduled for four weeks postpartum. Data were collected via a phone interview. At approximately three weeks postpartum, the BSES and the NSB were mailed to the participant's home to be referred to if needed during the phone interview. At four weeks postpartum, the researcher telephoned the participant, and asked for the responses to the BSES and the NSB. Information about breastfeeding pattern and duration was also collected at that time (see Appendix F). Interviews took approximately 5 to 10 minutes to complete. Participants were given a \$10 Toys R Us gift certificate, which was mailed to their homes after the second data collection point. If participants were unable to be reached by telephone during the fourth postpartum week, they were contacted by mail at 5 weeks postpartum, and efforts to reach them by telephone continued. If participants were not reached by 6 weeks postpartum, they were considered to be lost to follow-up ( $n = 12$ ).

*Protection of Participants*

This proposal was approved by the Institutional Review Board of the University of Massachusetts Lowell, and the Human Research Committee of the participating hospital. Potential or actual participants were not awakened if sleeping when approached. They were not interrupted during any medical or nursing procedure. They were encouraged to take as many breaks as necessary to avoid fatigue in completing the questionnaires. Phone calls were made at a mutually convenient time, and rescheduled if participants requested. Women were informed verbally and in writing that participation was entirely voluntary and could be terminated at any time. The flyer about the study and the informed consent document contained information about who could be contacted if they had any questions or concerns. Contact information was kept separately from the instruments to ensure confidentiality, and the instruments were identified by number only. Although provisions had been made to refer any breastfeeding questions or concerns raised during the study to the hospital's lactation service, such questions were not raised to the researcher and thus referral was not necessary.

*Data Analysis**Demographic Data*

Data were analyzed using Stata 9 Statistical Software (StataCorp, 2005). Demographic data included age ( $M$ ,  $SD$ ), ethnicity, marital status, education, mode of delivery and parity. Employment and economic characteristics were described by household income, eligibility for WIC, source of health insurance, percentage of

household income derived from mother's work income, and maternity leave variables.

The number of participants in each demographic category and the percentage of the total population this represented were reported. In addition, breastfeeding characteristics of the sample were described, including previous experience with breastfeeding, intended feeding pattern, intended duration of breastfeeding and timing of feeding decision.

### *Breastfeeding Self-Efficacy*

The breastfeeding self-efficacy scores collected immediately postpartum (Time 1) were used in the current analysis. Breastfeeding self-efficacy scores at Time 2 will be used for future analyses. Breastfeeding self-efficacy scores were calculated as a sum of the scores for each of the 14 items on the BSES-SF instrument. The scores were entered into the regression models as a continuous variable. Mean breastfeeding self-efficacy scores in first week postpartum were analyzed by breastfeeding characteristics, including planned pattern and duration of breastfeeding, hospital feeding pattern, feeding pattern at one month (Time 2) and previous breastfeeding experience. Mean breastfeeding self-efficacy scores were also analyzed with respect to the demographic characteristics of age, living with a partner, education, household income, source of health insurance, ethnicity and mode of delivery, as these variables have been associated with breastfeeding in previous research. Differences in breastfeeding self-efficacy between groups based on both demographic and breastfeeding characteristics were analyzed using t-tests when two groups were being compared and analysis of variance (*ANOVA*) when more than two groups were compared. A multiple regression analysis using breastfeeding self-efficacy as the dependent variable was also undertaken. The breastfeeding self-efficacy scores in

this sample were also compared to the scores in other reported samples where the BSES-SF was used to measure breastfeeding self-efficacy.

#### *Network Support for Breastfeeding*

Descriptive data about the breastfeeding support network were described as the important people identified as part of the network, and the number of respondents reporting each relationship as being important. In addition, factors important to making a decision to breastfeed were described, with percentages of the sample reporting these factors as not important, slightly important, important or very important. The network support for breastfeeding was calculated by first calculating an average for each of up to five individuals reported to be the most important people in the network. Each individual in the network could receive an average score from 0 to 3. These scores were then averaged to determine the average support score for the close network. Two additional individuals could be reported who were expected to provide breastfeeding support as well. An average score was calculated for each of these breastfeeding supporters in the extended network, if any, and an average score was calculated for these additional people. An average score for the close network and the extended network combined was then calculated. Each respondent could have a total network support score ranging from 0 to 3. The network support scores were entered into the regression models as a continuous variable. Support from pediatric providers was analyzed separately.

#### *Breastfeeding Pattern and Duration*

Breastfeeding pattern was calculated by recording the number of breast feedings and the number of other feedings reported by the respondents in the past 24 hours. These

responses were then categorized according to Labbok and Krasovec's (1990) six categories of breastfeeding: exclusive breastfeeding, almost exclusive breastfeeding (breast milk and other fluids such as vitamins or water, but not formula), partial/high breastfeeding (more than 80% of feeding was breast milk), partial/medium breastfeeding (20-80% of infant's feeding was from breast milk), partial/low breastfeeding (less than 20% of infant's feeding was from breast milk), token breastfeeding (some breastfeeding, not a significant nutritional impact) and formula feeding only (weaned completely from breastfeeding). Several cases were reviewed with M. Labbok (personal communication, May 16, 2006, & August 1, 2006) to confirm that they were placed in the appropriate breastfeeding category. A feeding was considered to be breastfeeding if the infant received breast milk either directly from the breast or in a bottle of expressed breast milk. If an infant received formula after each breast feeding, responses were placed in the partial/medium breastfeeding category. Respondents who were breastfeeding less than once/day were categorized as token breastfeeding. The breastfeeding pattern of the sample was reported using six categories, but in order to have enough responses in each breastfeeding category in the regression analyses, the responses were recoded into a variable with three categories of feeding: exclusive or high breastfeeding, partial breastfeeding, and weaned or token breastfeeding.

Breastfeeding duration was reported as the age of the infant when weaned. Most women reported the age of the infant was weaned in weeks, with the exception of the five women who had weaned before the infant was a week old. The duration of breastfeeding for these women was entered as a fraction of a week. Infants who had not been weaned

by four weeks were described as breastfeeding, regardless of the breastfeeding pattern. Reasons respondents gave for weaning were also categorized. The relationship between the intended feeding pattern as reported in the early postpartum period (Time 1) and the actual feeding pattern at Time 2 was analyzed using chi square analysis.

### *Relationships among Variables*

Data were collected on age, marital status, ethnicity, parity, mode of delivery, employment, income, education, planned pattern of breastfeeding and previous experience with breastfeeding. These variables have been found in previous research to be associated with breastfeeding, and so were included as controlling variables in the regression models. Prior to developing the regression models to analyze breastfeeding pattern and duration, relationships among these variables were analyzed using correlation analysis for evidence of multicollinearity. Relationships between categorical variables and breastfeeding self-efficacy (a continuous variable) were analyzed using either t-tests or ANOVA, depending on the number of categories. Finding no significant evidence of multicollinearity, each of these variables were analyzed individually using multinomial logistic regression to determine if there was a significant relationship ( $p \leq .05$ ) between the variable and the outcome of breastfeeding pattern. Each variable was also entered into a Cox regression model to determine if there was a significant individual relationship with breastfeeding duration. Variables which showed a significant individual relationship were entered into the regression models for further analysis.



### *Variable Transformation*

In order to have at least five responses in each category, and groups that were approximately similar in size, some variables were collapsed into fewer categories. For example, marital status, a variable with five categories reported, was redefined as two categories, living with a partner: yes/no. The ethnic categories of Cape Verdean, Haitian and West Indian/Caribbean were grouped together, as each group could be represented as being from the islands in the West Indies. Those who reported their ethnicity as “multiple” or “other” were also grouped together and described as “multiple or other”, so that ethnic category was entered in the model as a variable with four categories. Categorical variables were transformed into indicator variables (“dummy variables”) for the regression models. If there were missing data in a respondent’s BSES, the missing item was replaced with the mean of the respondent’s other responses (Munro, 2005). In one case, there were missing data for 7 of the 14 items in the BSES, and these were not replaced, resulting in missing data for the BSES for one respondent at Time 1. Missing data for other variables were not replaced. Participant’s responses were omitted from analyses if variables entered had missing data; therefore some of the analyses did not include all the participants. Interaction variables, using the product of the BSES and each of the other significant variables, were formed and analyzed, but were not found to be statistically significant.

Regression models using significant independent variables were compared using the Bayes Information Criteria (BIC) (Stata base reference manual, 2005) to measure goodness-of-fit (Crown, 1998). The calculation of the BIC uses the log likelihood of the

model while taking into account the sample size and the number of regressors in the model. Better models have a higher likelihood, and using the formula for BIC (Stata base reference manual), smaller values are considered the best fit. In general, variables that were not significant at the  $p = .05$  level were not included in the models. However, variables with a relationship at the  $p = .10$  level were analyzed, and were retained in the model if they improved the model fit.

#### *Analysis of Breastfeeding Duration and Pattern*

Breastfeeding duration was analyzed using the Cox Proportional Hazards Model. The dependent variable was “time until weaned” in weeks. Most of the women (85%) were still breastfeeding at four weeks postpartum (Time 2). These respondents were right censored and thus included in the analysis, and compared to the respondents who had already weaned their infants. The Cox model allows for the estimate of a hazard ratio while controlling for the effects of other covariates (Rosner, 1999). Results were reported as a hazard ratio, with a hazard ratio  $< 1$  considered being protective of breastfeeding.

Breastfeeding pattern was analyzed using ordered logistic regression. Breastfeeding pattern in three categories was the ordered dependent variable. The highest category in the order was exclusive breastfeeding, followed by partial or combination breastfeeding and weaned or token breastfeeding was the lowest category. The results were reported using odds ratios and confidence intervals.

### CHAPTER III: RESULTS

#### Breastfeeding Characteristics

Nearly half of the sample had previous experience with breastfeeding at least one previous infant, and the majority (56.9%) had been breastfed themselves (see Table 3). A larger proportion of women planned to exclusively breastfeed (53%), compared to those who planned to combine both breastfeeding and formula feeding. Significant differences among groups were found in planned pattern of feeding (see Table 4). Women who identified themselves as being West Indian (including Cape Verdean, Haitian, or West Indian/Caribbean) were more likely to plan to breastfeed in combination with formula. African-American women were more likely to plan exclusive breastfeeding. Women with higher education were more likely to plan exclusive breastfeeding. Income level had a varied relationship to planned pattern. At lower income levels, women were more likely to plan to combine breast and formula and at higher levels they were more likely to plan exclusive breastfeeding. However, in the category of household income of \$41,000 to 60,000/year, women were equally likely to choose exclusive breastfeeding or combination feeding.

#### Breastfeeding Self-Efficacy

##### *Breastfeeding Self-Efficacy by Breastfeeding Characteristics*

The average score for breastfeeding self-efficacy in the first week postpartum (Time 1) for the whole sample ( $N = 154$ ) was 51.86 ( $SD = 12.05$ , range 18 - 70). Average breastfeeding self-efficacy scores differed by breastfeeding characteristics, and these

results are reported in Table 5. Breastfeeding self-efficacy scores were higher than the sample average in women who were breastfeeding at the highest (most exclusive) level at one month postpartum, and in women who had previous breastfeeding experience. For women who were breastfeeding at the highest level at 4 weeks postpartum, the average BSES score at Time 1 was 55.34 ( $SD = 10.77$ , range 31.20 – 70.00).

For women who were partially breastfeeding at 4 weeks postpartum, the average BSES was 50.93 ( $SD = 10.80$ , range 24 – 70), and for women who had weaned or were token breastfeeding at 4 weeks postpartum, the average BSES score was 45.43 ( $SD = 15.24$ , range 18 - 67). Women who planned to combination feed had lower BSES scores at Time 1 than those who planned to exclusively breastfeed, although the difference was not statistically significant.

#### *Breastfeeding Self-Efficacy by Demographic Characteristics*

Some differences in average breastfeeding self-efficacy scores based on demographic characteristics were noted (Table 6). Significant differences were noted among different ethnic groups when mean breastfeeding self-efficacy scores were compared using *ANOVA*. A post-hoc analysis using the Bonferroni multiple comparison method revealed that the significant difference was between women who identified themselves as African, and those who identified themselves as African-American. Women who were West Indian, Cape Verdean or Haitian appeared to have had higher BSES scores than African-American women, but this was not statistically significant.

Mean breastfeeding self-efficacy scores appeared to differ based on educational level, such that those with higher education had lower mean breastfeeding self-efficacy

**Table 3***Breastfeeding Characteristics of the Sample (N = 155)*

	<i>n</i>	%
Previous experience with breastfeeding?		
Yes	76	49.03
No	79	50.97
Intended feeding pattern*		
Exclusive breastfeeding	82	53.25
Both breast and formula feeding	72	46.75
Intended duration of breastfeeding*		
6 weeks or less	1	0.65
7-12 weeks	11	7.19
13-24 weeks	20	13.07
25-36 weeks	8	5.23
More than 36 weeks	11	7.19
As long as the baby wants	47	30.72
Don't know	55	35.95
Was breastfed as an infant*		
Yes	87	56.86
No	46	30.07
Don't know	20	13.07
Members of family have breastfed an infant*		
Yes	136	88.31
No	18	11.69
Saw a lactation consultant in hospital		
Yes	14	9.03
No	123	79.35
Attended class only	8	5.16
Consult planned, not yet received	10	6.45
Timing of feeding decision		
Before pregnancy	104	67.10
During pregnancy	48	30.97
After birth	3	1.94

\*Data missing for some respondents

Table 4

*Significant Influences on Planned Pattern of Feeding*

<i>Variable</i>	<i>Planned feeding pattern</i>		$\chi^2$	<i>p</i>
	<i>Exclusive Breastfeeding n (%)</i>	<i>Combination breast and formula n (%)</i>		
<b>Ethnicity (<i>n</i> = 151)*</b>				
African	6 (7.4)	9 (12.8)	9.54	.02
African-American	32 (39.5)	17 (24.3)		
West Indian <sup>a</sup>	19 (23.5)	30 (42.9)		
Multiple or other	24 (29.6)	14 (20.0)		
<b>Education (<i>n</i> = 155)</b>				
12 years or less	10 (12.1)	23 (31.9)	11.44	.01
>12 and ≤ 16 years	54 (65.1)	42 (58.3)		
>16 years	19 (22.9)	7 ( 9.7)		
<b>Household Income (<i>n</i> = 146)*</b>				
\$20,000/year or less	14 (18.0)	13 (19.1)	10.19	.04
21,000-40,000/year	12 (15.4)	24 (35.3)		
41,000-60,000/year	15 (19.2)	13 (19.1)		
61,000-80,000/year	16 (20.5)	7 (10.3)		
81,000 or more/year	21 (26.9)	11 (16.2)		
<b>Eligibility for WIC (<i>n</i> = 146)*</b>				
Eligible	39 (50.6)	46 (66.7)	3.84	.05
Not eligible	38 (49.4)	23 (33.3)		

<sup>a</sup>Includes Cape Verdean, Haitian, West Indian/Caribbean

\*Data missing for some respondents

Table 5

*Average Breastfeeding Self-efficacy Scores (BSES) at Time 1 by Breastfeeding Characteristics*

Breastfeeding Characteristic	BSES (Time 1)	
	Mean	(SD)
Intended pattern of feeding ( $n = 154$ ) <sup>a</sup>		
Exclusive breastfeeding	52.32	(12.28)
Combination breast and formula	51.32	(11.84)
*Intended duration of feeding ( $n = 151$ ) <sup>a</sup>		
24 weeks or less	49.30	(13.14)
More than 24 weeks or as long as baby wants	50.43	(12.68)
Don't know	55.98	( 9.94)
*Feeding pattern while in hospital ( $n = 141$ ) <sup>a</sup>		
Exclusive or high breastfeeding (> 80%)	53.2	(10.64)
Partial, low or not yet initiated	49.07	(14.20)
**Feeding pattern at one month postpartum ( $n = 143$ ) <sup>a</sup>		
Exclusive or high (> 80%)	55.34	(10.77)
Partial	50.93	(10.80)
Weaned or token breastfeeding	45.43	(15.24)
**Previous breastfeeding experience ( $n = 155$ )		
Has breastfed at least one child	54.81	(10.96)
No previous experience	48.98	(12.44)

<sup>a</sup> Data missing for some respondents

\* $p < .05$

\*\* $p < .01$

scores (see Table 6), but the difference was not statistically significant. There was a significant difference noted in breastfeeding self-efficacy based on the source of health insurance. Women who had private health insurance had lower breastfeeding self-efficacy than women whose health insurance was provided by government sources.

#### *Variables Predicting Breastfeeding Self-Efficacy*

In the multiple regression analysis with breastfeeding self-efficacy as the outcome, several factors were noted to have a significant influence on breastfeeding self-efficacy (Table 7). Previous breastfeeding had a significant relationship to breastfeeding self-efficacy ( $p < .01$ ), with higher levels of breastfeeding self-efficacy noted in those with previous experience. Planning to breastfeed exclusively was associated with breastfeeding self-efficacy, but this did not reach statistical significance ( $p = .057$ ). Education was significantly associated with self-efficacy. Using women with over 16 years of education as the reference group, higher breastfeeding self-efficacy was found in women with 12 to 16 years of education, as well as those with 12 years of education or less. Ethnicity was another variable associated with self-efficacy. Using African-American women as the reference group, all of the other ethnic groups had higher levels of breastfeeding self-efficacy, but the difference was statistically significant only for those who reported their ethnicity as African. In addition, network support for breastfeeding was significantly associated with breastfeeding self-efficacy in this sample. Women who had higher scores on the NSB (higher levels of total support) had higher BSES scores as well.



*Breastfeeding Self-Efficacy Compared to Other Samples*

Breastfeeding self-efficacy scores for this sample were compared to the scores in other reported samples (including Canadian women and Polish women) where the BSES-SF was used to measure breastfeeding self-efficacy (see Table 8). In each of the samples, average breastfeeding self-efficacy was higher in women with previous breastfeeding experience, and was also higher in women who were breastfeeding more exclusively as compared to those who were combination breastfeeding and formula feeding (partial breastfeeding) (Dennis, 2002; Wutke & Dennis, 2006).

*Network Support for Breastfeeding*

In making the decision to breastfeed, most of the women reported that the opinion of their baby's father and their own mother were important. An even larger percent of the sample reported that the advice of their health care providers was important in their decision (see Table 9). When listing the most significant people who provided support, most of the women included their partners and their mothers (see Table 10).

Average support scores as measured by the NSB could range from 0 - 3. In this sample, the average level of network support for breastfeeding was 2.27 (range 0.2 - 3) at Time 1. If a respondent rated an individual with a score of 2, this meant that she perceived that the individual provided an "average amount" of support (NSB instrument is included in Appendix A). Based on the NSB scoring system, most participants had a higher than average perception of breastfeeding support. Support from the postpartum woman's mother (Table 10) was rated the highest (average support score 2.6, range 0.8 - 3), followed by partners (mean 2.3, range 0.2 - 3) and friends (mean 2.3, range 0.9 - 3).

The average number of support people for each respondent was 5 ( $SD = 1$ ), so they were in general well-supported. Perceived support from members of the network appeared to increase for all of the relationships reported when measured at Time 2, at one month postpartum (Table 10). Women who had previous experience with breastfeeding reported a slightly lower perception of support (support score = 2.2) than those who were breastfeeding for the first time (support score = 2.3), but this difference was not statistically significant. All respondents were asked at Time 2 to rate the support they received from their pediatric providers. The average support from pediatric providers was 2.8 ( $SD = 0.45$ , range 0 - 3).

#### Breastfeeding Pattern and Duration

While in the hospital, half of the sample reported exclusive breastfeeding. Another 44% were breastfeeding in combination with formula. By one month postpartum (Time 2), 34.27% continued to be breastfeeding exclusively, and 35.67% were breastfeeding in combination with formula (partial breastfeeding). Among those who were partially breastfeeding, the largest percentage was breastfeeding at a high level, with more than 80% of the infant's nourishment being from breastfeeding (see Table 11). Twenty-two infants (15.38%) had already been weaned, most by 2 weeks of age. The most frequently reported reasons the mothers gave for weaning were insufficient milk and sore nipples (see Table 12).

As expected, there was a significant relationship between what women reported in the early postpartum period as their plan for infant feeding (exclusive breastfeeding or combination of breast and formula feeding), and their actual feeding pattern at one

Table 6

*Average Breastfeeding Self-Efficacy Scores (BSES) by Selected Demographic Variables*

<i>Maternal Demographic Variables</i>	<i>BSES</i>	
	<i>Mean</i>	<i>(SD)</i>
Age category ( $n = 149$ ) <sup>a</sup>		
18-25 years old	50.05	( 9.54)
26-34 year old	51.32	(12.20)
35 years or older	52.62	(13.67)
Living with partner ( $n = 152$ ) <sup>a</sup>		
Yes	51.89	(13.22)
No	51.80	( 9.07)
Education ( $n = 154$ ) <sup>a</sup>		
12 years or less	53.77	(11.11)
More than 12, up to 16 years	52.60	(11.88)
More than 16 years	46.79	(12.88)
Household income ( $n = 155$ )		
\$20,000/year or less	55.07	( 7.55)
21,000 - 40,000/year	51.30	(12.58)
41,000 - 60,000/year	49.73	(13.95)
61,000 - 80,000/year	55.65	( 9.70)
81,000 or more/year	46.28	(13.98)
*Source of health insurance ( $n = 154$ ) <sup>a</sup>		
Private insurance	50.40	(12.40)
Government-provided	54.35	(11.12)
*Ethnic background ( $n = 155$ )		
African	60.71	( 8.53)
African-American	47.90	(12.26)
Cape Verdean	52.08	(13.69)
Haitian	53.01	(13.29)
West Indian/Caribbean	52.37	(11.95)
Multiple ethnic backgrounds	51.87	(11.15)
Other	57.00	( 7.79)
Mode of delivery ( $n = 154$ ) <sup>a</sup>		
Vaginal birth	50.72	(11.83)
Cesarean birth	53.77	(12.24)

<sup>a</sup> Data missing for some respondents\* $p < .05$

Table 7

*Variables Associated with Breastfeeding Self-Efficacy (N = 151)*

<i>Source</i>	<i>SS</i>	<i>df</i>	<i>MS</i>		
Model	6231.69	8	779.0	F (8,142) = 6.98	
Residual	15835.7	142	111.5	Prob >F = < .001	
Total	22068.4	150	147.1	R <sup>2</sup> = 0.28	
				Adjusted R <sup>2</sup> = 0.24	
				Root MSE = 10.56	

  

	<i>Coefficient</i>	<i>SE</i>	<i>95% CI</i>	<i>p</i>
Previous breastfeeding experience	7.0	1.8	3.5 - 10.5	<.01
Planning to exclusively breastfeed <sup>a</sup>	3.6	1.9	-.1 - 7.3	.06
Having 12 years or less education <sup>b</sup>	9.1	3.0	3.2 - 15.1	<.01
Having >12 and ≤ 16 years education <sup>b</sup>	6.7	2.4	1.9 - 11.5	<.01
Ethnicity: Cape Verdean, Haitian, or West Indian <sup>c</sup>	2.8	2.2	-1.6 - 7.3	.20
Ethnicity: African <sup>c</sup>	10.0	3.3	3.5 - 16.5	<.01
Ethnicity: Multiple <sup>c</sup>	3.6	2.3	-1.1 - 8.2	.13
Level of breastfeeding support (NSB)	6.3	1.8	2.75 - 9.8	<.01

<sup>a</sup>Planning to combine breastfeeding and formula feeding is the reference group<sup>b</sup>Having over 16 years of education is the reference group<sup>c</sup>Ethnicity: African-American is the reference group

Table 8

*Comparison of Mean Breastfeeding Self-Efficacy Scores (Time 1) by Breastfeeding Characteristics from this Sample with Other Reported Scores*

	<i>Current Sample N=142</i>	<i>Canadian sample N=104<sup>a</sup></i>	<i>Polish sample N=105<sup>b</sup></i>
	<i>BSES Mean (SD)</i>	<i>BSES Mean (SD)</i>	<i>BSES Mean (SD)</i>
<i>Breastfeeding experience</i>			
Women with previous breastfeeding experience	56.8 (11.0)	58.2 (10.9)	60.4 (6.5)
First time mothers	49.0 (12.5)	53.5 (10.3)	54.2 (8.4)
<i>Breastfeeding pattern at 4 weeks postpartum</i>			
Exclusive breastfeeding	55.3 (10.8)	58.4 (8.9)	n/a
Combination feeding	50.9 (10.8)	50.1 (12.2)	n/a
Formula feeding only (weaned)	45.4 (15.2)	41.56 (12.2)	n/a

<sup>a</sup>(Dennis, 2002)

<sup>b</sup>(Wutke & Dennis, 2006)

month, with 59% of women feeding according to their plan reported at Time 1 (see Table 13). Of the 67 women who planned to combine breast and formula feeding, 14 (21%) had weaned their baby by one month postpartum, but interestingly, 11 (16%) were exclusively breastfeeding. Nine of the 75 women (6%) who had planned to breastfeed exclusively had weaned their infant at one month. Sixteen percent (16.8%) of the entire sample had weaned by one month postpartum.

Table 9*Social Network Factors Reported as Important to Breastfeeding Decision*

	<i>Not important</i> <i>n (%)</i>	<i>Slightly</i> <i>important</i> <i>n (%)</i>	<i>Important</i> <i>n (%)</i>	<i>Very</i> <i>important</i> <i>n (%)</i>
The opinion of the baby's father	25 (16.34)	26 (16.99)	54 (36.60)	46 (30.07)
Mother's opinion	17 (11.26)	33 (21.85)	54 (35.76)	47 (31.13)
What most of female relatives do	67 (43.79)	32 (20.92)	38 (24.84)	16 (10.46)
What most friends do	87 (57.24)	38 (25.00)	19 (12.50)	8 (5.26)
Health care provider's advice	2 (1.31)	18 (11.76)	66 (43.14)	67 (43.79)

*Relationship between Breastfeeding Self-Efficacy and Breastfeeding Duration*

The first hypothesis, that higher levels of breastfeeding self-efficacy immediately postpartum would predict a longer duration of breastfeeding in black women, was supported. Breastfeeding self-efficacy in the first week postpartum (Time 1), as measured by the BSES-SF, was significantly ( $p = .04$ ) predictive of continued breastfeeding (hazard ratio = .97), as reported in Table 14. Women with higher levels of breastfeeding self-efficacy at Time 1 were more likely to be continuing to breastfeed at one month postpartum (Time 2). For each unit change in breastfeeding self-efficacy (the range of scores = 18 – 70), there was a decreased risk of having weaned by one month postpartum.

Table 10

*Average Network Support Scores for Significant Members of Network*

<i>Important People in Network</i>	<i>Number Reporting Time 1 (first week postpartum)</i>	<i>Mean Support Score<sup>a</sup> (Range)</i>	<i>Number Reporting Time 2 (1 month postpartum)</i>	<i>Mean Support Score<sup>a</sup> (Range)</i>
Partner	131	2.3 (0.2 – 3.0)	122	2.4 (0.0 – 3.0)
Mother	129	2.6 (0.8 – 3.0)	110	2.7 (0.6 – 3.0)
Other female relatives	215 <sup>b</sup>	2.0 (0.0 – 3.0)	212 <sup>a</sup>	2.6 (1.0 – 3.0)
Friends and work/school associates	123 <sup>b</sup>	2.3 (0.9 – 3.0)	111 <sup>a</sup>	2.5 (1.0 – 3.0)
Male relatives (including father)	58 <sup>b</sup>	1.4 (0.0 – 3.0)	63 <sup>a</sup>	2.0 (0.0 – 3.0)
Church-related person (clergy, church friends, godparents, God)	52 <sup>b</sup>	1.9 (0.2 – 3.0)	25 <sup>a</sup>	2.5 (1.2 – 3.0)
<i>Professionals in Network</i>				
Lactation consultants	5	2.8 (2.4 – 3.0)	16	2.9 (2.2 – 3.0)
Pediatric health care provider	n/a	n/a	118 <sup>c</sup>	2.8 (0.0 – 3.0)
Other health care professionals	39	2.8 (1.5 – 3.0)	18	2.8 (2.2 – 3.0)

<sup>a</sup> 0 = “not at all”

1 = “a little bit”

2 = “an average amount”

3 = “very much”

<sup>b</sup> Some respondents reported more than one significant person in this category<sup>c</sup> All respondents were asked to rate the support provided by their pediatric provider at Time 2

Breastfeeding self-efficacy was the only predictor related to breastfeeding duration that was significant at the .05 level. Age, specifically being between the ages of 26 and 34, had a relationship to breastfeeding duration ( $p = .07$ ) which was not statistically significant, but age was left in the model because it improved the model fit based on the BIC. Other variables that were analyzed and not significantly related to breastfeeding duration in the bivariate analysis were not included in the model. These variables included network support for breastfeeding as measured by the NSB, household income, percentage of household income provided by mother's salary, source of health insurance, mother's education, ethnicity, planned pattern of breastfeeding, planned duration of breastfeeding and living with a partner.

#### *Relationship between Breastfeeding Self-Efficacy and Breastfeeding Pattern*

The second hypothesis, that higher levels of breastfeeding self-efficacy immediately postpartum would predict a more exclusive pattern of breastfeeding in black women, was also supported. Breastfeeding self-efficacy, as measured by the BSES-SF at Time 1, was significantly associated ( $p < .01$ ) with more exclusive breastfeeding at 4 weeks postpartum (Table 15). For each unit change in breastfeeding self-efficacy (range = 18 - 70) the odds of breastfeeding at a higher level (more exclusive breastfeeding) increased.



Table 11

*Breastfeeding Pattern (Time 1 & Time 2) and Duration of Breastfeeding at Four Weeks Postpartum (Time 2)*

	<i>n</i>	%
Feeding pattern in hospital (at study entry, <i>n</i> = 141)*		
Full, exclusive	71	50.35
Full, almost exclusive	2	1.42
Partial, high (> 80%)	13	9.22
Partial, medium (20 - 80%)	49	34.75
Partial, low	3	2.13
Not yet initiated	3	2.13
Feeding pattern at one-month postpartum ( <i>n</i> = 143)		
Full, exclusive	49	34.27
Full, almost exclusive	4	2.80
Partial, high (> 80%)	17	11.89
Partial, medium (20 - 80%)	45	31.47
Partial, low (< 20%)	4	2.80
Token/weaned	24	16.78
Age of infants when weaned ( <i>n</i> = 143)		
Less than 1 week	5	3.5
1 week	2	1.3
2 weeks	8	5.6
3 weeks	4	2.8
4 weeks	3	2.1
Not yet weaned	121	85.0

\* Data missing for some respondents

Table 12*Reasons for Weaning (n=24)*

<i>Reason for weaning<sup>a</sup></i>	<i>Number of women reporting</i>
Not enough milk, baby not satisfied	7
Painful latch-on, sore nipples	6
Baby wouldn't latch on	5
Health issue with mother	4
Mother too overwhelmed	2
Health issue with infant (jaundice)	1

<sup>a</sup>Several women reported more than one reason

Although age was not a significant predictor of breastfeeding pattern, the variable was kept in the model to allow for comparison between the results and other research studies. Variables that were entered into the model, but were not found to be predictive included level of breastfeeding support as measured by the NSB, mother's education, household income, percentage of household income provided by mother's income, living with a partner, mode of delivery, parity, ethnicity, and intended duration of breastfeeding.

*Other Variables Related to Breastfeeding Pattern*

In addition to breastfeeding self-efficacy, planned pattern of breastfeeding was a significant predictor of breastfeeding pattern at 4 weeks postpartum in the regression analysis, as it was in the bivariate analysis (see Table 13). Planning to breastfeed

Table 13

*Intended Feeding Pattern Compared to Actual Feeding Pattern at One Month Postpartum (N = 142)*

<i>Intended Pattern</i>	<i>Actual Pattern</i>			
	<i>Exclusive Breastfeeding</i>	<i>Combination Breast &amp; Formula</i>	<i>Weaned</i>	<i>Total</i>
<i>Exclusive breastfeeding</i>				
Observed frequency	42.0	24.0	9.0	75.0
Expected frequency	28.0	34.9	12.1	75.0
$\chi^2$ contribution	7.0	3.4	0.8	11.2
Cell percentage	29.6	16.9	6.3	52.8
<i>Combination breast &amp; formula</i>				
Observed frequency	11.0	42.0	14.0	67.0
Expected frequency	25.0	31.1	10.9	67.0
Expected frequency	7.8	3.8	0.9	12.5
$\chi^2$ contribution	7.8	29.6	9.9	47.2
Cell percentage				
<i>Total</i>				
Observed	53.0	66.0	23.0	142.0
Cell percentage	37.3	46.5	16.2	100.0

Pearson  $\chi^2$  (2) = 23.8  $p < .001$

Table 14

*Predictors of Breastfeeding Duration at Four Weeks Postpartum (N = 137)*

<i>Variable</i>	<i>Hazard Ratio<sup>b</sup></i>	<i>95% CI</i>	<i>p</i>
Breastfeeding self-efficacy (Time 1) <sup>a</sup>	0.97	0.933 - 0.999	.04
Age 18 – 25 <sup>c</sup>	0.61	0.221 – 1.678	.34
Age 26 – 34 <sup>c</sup>	0.39	0.140 – 1.067	.07

<sup>a</sup>Breastfeeding self-efficacy is a continuous variable<sup>b</sup> Hazard ratio <1 is considered protective of breastfeeding<sup>c</sup> Reference category is "Age 35 or older"

Table 15

*Predictors of Breastfeeding Pattern at Four Weeks Postpartum<sup>a</sup> (N = 137)*

<i>Predictors</i>	<i>Odds ratio</i>	<i>(95% CI)</i>	<i>p</i>
Breastfeeding self-efficacy (Time 1) <sup>b</sup>	1.05	(1.02 – 1.08)	< .01
Age 18-25 <sup>c</sup>	.66	(0.28 – 1.60)	0.4
Age 26-34 <sup>c</sup>	.95	(0.43 - 2.11)	0.9
Planned exclusive breastfeeding <sup>d</sup>	4.10	(2.05 – 8.17)	< .01

<sup>a</sup> Breastfeeding pattern:

1 = weaned/token breastfeeding

2 = partial (combination breastfeeding and formula feeding)

3 = exclusive breastfeeding

<sup>b</sup> Breastfeeding self-efficacy is a continuous variable<sup>c</sup> Reference category is "Age > 35"<sup>d</sup> Reference category is "Both breast and formula feeding planned"

exclusively was a significant predictor ( $p < .01$ ) of exclusive breastfeeding at one month postpartum (Time 2).

### Summary of Results

Breastfeeding self-efficacy measured within the first week postpartum significantly predicted both breastfeeding duration and breastfeeding pattern in this sample of black women. Higher levels of breastfeeding self-efficacy at Time 1 predicted continued breastfeeding at 4 weeks postpartum (Time 2), in answer to the first research question. Higher levels of breastfeeding self-efficacy predicted a more exclusive pattern of breastfeeding at 4 weeks postpartum, answering the second research question. Both research hypotheses were supported by this analysis.

## CHAPTER IV: DISCUSSION

### Breastfeeding Self-Efficacy and Breastfeeding Duration and Pattern

#### *Breastfeeding Self-Efficacy and Breastfeeding Duration*

Breastfeeding self-efficacy, defined as a mother's belief that she will be able to organize and carry out the actions necessary to breastfeed her infant (as measured by the BSES administered in the early postpartum period), was a significant predictor of breastfeeding duration in this sample of black women. Women with higher levels of BSES were more likely to be breastfeeding at 4 weeks postpartum. This is consistent both with the proposed hypothesis, as well as with previous studies using the BSES instrument (Blyth et al., 2002; Dai & Dennis, 2003; Dennis & Faux, 1999; Wutke & Dennis, 2006) in other populations. Interestingly, few variables other than breastfeeding self-efficacy were predictors of breastfeeding duration in this sample.

Planned duration was not a significant predictor of the actual duration of breastfeeding in this sample. However, there was a significant difference in average self-efficacy scores based on the planned duration of breastfeeding. Women who planned to breastfeed 24 weeks or less had significantly lower average breastfeeding self-efficacy scores in the first week postpartum than those who planned to breastfeed for more than 24 weeks or as long as the baby wanted. Women with the highest average level of breastfeeding self-efficacy reported that they did not know how long they planned to breastfeed. This high level of breastfeeding self-efficacy could mean that not knowing how long one was intending to breastfeed actually represents willingness to breastfeed for

a prolonged period of time. However, this finding is difficult to interpret without more qualitative information about what factors women expect to influence how long they continued breastfeeding. The relationship between higher average self-efficacy scores and the intention to breastfeed for longer period of time does suggest that breastfeeding self-efficacy may influence how long a woman plans to breastfeed. This would explain why breastfeeding self-efficacy was a significant predictor of breastfeeding duration while planned duration was not.

None of the participants had reported the intent to breastfeed less than 6 weeks, so all of the 22 women who were exclusively formula feeding at one month postpartum had weaned their infants earlier than intended. Some of the reasons for weaning given by the respondents (see Table 8) were related to unexpected circumstances such as maternal illness or infants who could not successfully latch on. These circumstances may have had an independent effect on breastfeeding duration, or they may have had a negative influence on breastfeeding self-efficacy.

Other reasons given for weaning, such as the perception of not having enough milk, may also have been related to breastfeeding self-efficacy. Several mothers reported that they weaned because they were never able to get the infant to successfully latch on to the breast. Based on self-efficacy theory (Bandura, 1997), breastfeeding self-efficacy is likely to have an influence on how long a mother persists in attempting to initiate breastfeeding, and how much support and assistance she seeks from others when she encounters difficulties. Women with higher levels of breastfeeding self-efficacy may have persisted longer to achieve latch-on and sought more assistance before deciding to

wean because the infant could not latch-on. Johnsen (2004) provided qualitative descriptions of many women who persisted in breastfeeding despite a variety of problems, including poor latch-on and feeding problems, describing them as having “the will to keep going, to keep giving, to persevere, to find answers, support and advice that will help” (p. 47). These women appeared to continue breastfeeding despite problems because of a strong perception of breastfeeding self-efficacy.

The reasons women gave for weaning, including not having enough milk to satisfy the baby and painful or unsuccessful latch-on, may also have influenced the decision to give formula during the maternity hospitalization. As experiencing success in accomplishing a task is the most influential source of efficacy information (Bandura, 1997), having breastfeeding problems and thus needing to use formula could decrease a woman’s breastfeeding self-efficacy. In this case, giving formula bottles may reflect lower breastfeeding self-efficacy and thus less willingness to persevere with breastfeeding for every feeding, ultimately leading to weaning earlier than planned.

The number of formula bottles given during the maternity hospitalization has been reported as a predictor of weaning (Hall et al., 2002), with the odds of weaning by 7 to 10 days postpartum increasing with each bottle of formula given. However in the current sample, the pattern of breastfeeding during the hospitalization, measured in two categories (exclusive/high breastfeeding, or partial/low/not yet initiated) was not a predictor of weaning by one month postpartum. Women who were breastfeeding with minimal formula bottles in the hospital (exclusive/high breastfeeding, more than 80% of feedings) did have significantly higher self-efficacy scores than those who were



breastfeeding in combination with formula (breastfeeding 80% or less of the time). As the reason for giving formula bottles was not elicited, the significance of these findings is not entirely clear. However, previous researchers have found that lack of confidence was a predictor of discontinuing breastfeeding (Ertem et al., 2001; Taveras et al., 2003). Lack of confidence, measured in this study as lower breastfeeding self-efficacy, may be a reason for the use of formula in the hospital. Since women with lower self-efficacy in this sample were more likely to have weaned by one month postpartum, the influence of giving bottles in the hospital on breastfeeding duration may have been obscured by the more significant influence of breastfeeding self-efficacy.

Lowered breastfeeding self-efficacy may be more related to early weaning in the first weeks postpartum, whereas intended duration may be more significant when the infant is older and weaning is planned rather than unexpected. The influence of planned duration on the actual duration of breastfeeding could be better evaluated with ongoing follow-up that continues to or beyond the planned duration of feeding, to determine whether women were successful in breastfeeding as they had intended.

#### *Breastfeeding Self-Efficacy and Breastfeeding Pattern*

Breastfeeding self-efficacy was also a significant predictor of breastfeeding pattern in this sample of black women, supporting the second hypothesis. Higher breastfeeding self-efficacy scores increased the odds of breastfeeding exclusively. This too is consistent with previous studies using the BSES instrument (Blyth et al. 2002; Creedy et al. 2003; Dennis, 2003; Dennis & Faux, 1999; Wutke & Dennis, 2006). In this study, women who were breastfeeding exclusively at four weeks postpartum had higher postpartum

breastfeeding self-efficacy scores than those who were combining breast and formula feeding, or those who had weaned their infants. Few other variables predicted breastfeeding pattern in this sample.

### Importance of Breastfeeding Self-Efficacy

#### *Breastfeeding Self-Efficacy in Black Women*

This was the first study of breastfeeding self-efficacy in a sample of exclusively black women. The findings of this study are consistent with prior research in other populations showing that breastfeeding self-efficacy is an important variable influencing breastfeeding outcomes. This supports Bandura's (2001) assertion that self-efficacy is a concept that is meaningful for understanding health behaviors in various cultures and ethnic groups.

Self-efficacy research with samples of black Americans found that in some cases, higher levels of self-efficacy did not predict health outcomes, such as weight loss and increased exercise, as expected (Diehl et al., 2001; Martin et al., 2004). This was not the case in this study. Higher levels of self-efficacy were associated with longer duration and more exclusive pattern of breastfeeding in this sample. This finding is consistent with previous breastfeeding research with other cultural and ethnic populations, and is encouraging for clinical practice. As many of the differences among cultural groups and the variables which influence breastfeeding are non-modifiable, identifying a potentially modifiable variable that influences outcomes provides an important theoretical basis for planning appropriate interventions.

*Breastfeeding Self-Efficacy and Ethnicity*

Differences were noted in breastfeeding self-efficacy among the different ethnic groups represented in this study. Because there were not enough respondents in each individual group, each ethnic group could not be analyzed separately. As a whole however, breastfeeding self-efficacy remained a significant predictor of breastfeeding outcomes.

The differences in ethnic groups in levels of breastfeeding self-efficacy as well as the planned pattern of breastfeeding offer evidence of significant diversity within the racial category, defined by the U.S. Census as Black/African American. Breastfeeding practices and breastfeeding rates are most likely different among the different ethnic groups represented as black. National statistics which report breastfeeding rates by race and not by ethnic category as well (DHHS, 2002) may be misleading. For example, in Healthy People 2010 (DHHS) blacks were reported to have had a lower percentage of women who breastfed their infants than white or Hispanic women. Conversely, statistics reported for Massachusetts (Massachusetts Department of Public Health (MA DPH), 2002a) reported that breastfeeding rates were high (ranging from 81-88%) for all ethnic groups of black mothers except African Americans (60%) and Cape Verdeans (70%), and that most ethnic groups had rates higher than white, non-Hispanic mothers (71%).

In the current study, women who identified themselves as African-American had lower mean breastfeeding self-efficacy scores than women in other ethnic groups. Cape Verdean women had higher mean breastfeeding self-efficacy scores than African-American women, but lower than women in other ethnic groups, except for those who

described themselves as being of multiple ethnic origins (see Table 6). These findings appear to be consistent with the Massachusetts statistics on breastfeeding rates. The reason for these ethnic differences is not readily evident. It is possible that more of the African-American women in the study were born in the United States, although data were not collected on country of birth. However, Massachusetts (MA DPH, 2002b) reported higher breastfeeding rates among non-U.S. born Hispanic, non-Hispanic black and non-Hispanic white women. Bonuck et al. (2005) also found that foreign-born women were more likely to breastfeed exclusively, and this may account for data showing higher breastfeeding self-efficacy in ethnic groups other than African-American.

It is also interesting to note that for women who identified themselves as Cape Verdean, 70% identified their race as “other” and only 24% identified their race as “Black” (MA DPH, 2002a). As the inclusion criterion for the current study was being a woman of African descent (black), the race of all Cape Verdean women in this study was reported as black, and individual women then reported their ethnicity as well. This may account for the reason that in the current study, there were more Hispanic women, and more who reported their ethnicity as “other” as compared to the Massachusetts data.

While it is known that there are geographic variations in breastfeeding rates (Li et al., 2005), accurate and consistent reporting of racial and ethnic information will be needed to clearly identify groups at risk for not breastfeeding, or unique characteristics of groups that would influence breastfeeding. Country of birth, and the amount of time living in the United States would be important data to collect in order to enhance

understanding and interpretation of racial and ethnic differences in breastfeeding characteristics.

### *Breastfeeding Self-Efficacy and Education*

In this sample, mean breastfeeding self-efficacy scores appeared to be lower as education levels became higher, although the differences did not reach statistical significance. The lowest average levels of breastfeeding self-efficacy appeared to be among women with more than 16 years of education. In the analysis of variables associated with breastfeeding self-efficacy (see Table 7), education was statistically significant. The same direction of influence was noted in both analyses, in that higher education was associated with lower breastfeeding self-efficacy. This finding was unexpected, as previous researchers have reported that women with higher educational levels had better breastfeeding outcomes (Callen & Pinelli, 2004; Piper & Parks, 2001). Dennis (2006) reported that women who were more educated had higher BSES scores, unlike the findings in this sample.

The women in this study were in general more highly educated as compared to all black women giving birth in Massachusetts (MA DPH 2002a). It is possible that women with higher education were more likely to agree to participate in a research study, although data on education were not collected on those who declined to participate. Only 21% of the sample had a high school education or less. The higher concentration of women with college education provided less variability in education to analyze with regard to breastfeeding self-efficacy.

Although these differences could be due to measurement error related to using the BSES-SF in this previously untested group, they could also represent a unique quality of breastfeeding self-efficacy in this population of black women. Since the country of origin, and the country of birth (U.S. or foreign) seems to influence the planned pattern of breastfeeding (Bonuck et al., 2005), and foreign born women are more likely to plan exclusive breastfeeding, perhaps the women in this sample who had more education had spent more time in the United States, and thus had moved farther away from the traditions and feeding patterns of their countries of origin. Women from different ethnic groups differ in their levels of educational attainment (MA DPH, 2002a), confounding the influence of education and ethnicity on breastfeeding self-efficacy. However, in this study, there were no significant differences in education based on ethnic group. It is possible that women with more education could be expected to be employed outside the home and the need to balance work and family responsibilities could be a concern that decreased their breastfeeding self-efficacy, especially if they did not have role models for how to accomplish such a balance. A larger and more educationally varied sample would be needed to understand if there are differences in breastfeeding self-efficacy related to education in diverse samples of women.

#### Additional Factors Influencing Breastfeeding Duration and Pattern

##### *Relationship of Intended/Planned Feeding Pattern to Breastfeeding Pattern*

While previous research has identified intended duration of breastfeeding as a predictor of actual breastfeeding duration (Scott & Binns, 1999), planned pattern of breastfeeding has not been addressed independently of planned duration. Generally,

studies of combination feeding have been in the context of perception of insufficient milk supply or other breastfeeding problems, rather than simply as the choice of combining breastfeeding and formula feeding as the intended pattern of infant feeding. Nonetheless, a pattern of partial breastfeeding (combining breastfeeding and formula feeding) has been associated with shorter duration of breastfeeding in previous studies (Hall et al., 2002; Hill & Humenick, 1997). However, in a sample of women of color eligible for WIC, Ertem et al. (2001) found that perception of insufficient milk (suggesting that they were likely to be giving formula as well) was reported by 28% of the women in the study. This however, did not predict early termination of breastfeeding. There was a significant relationship between intended and actual feeding pattern in this study, while controlling for the effects of breastfeeding self-efficacy. This suggests that the reason for combining breastfeeding and formula feeding must also be considered. While giving formula may be related to perception of insufficient milk and thus be related to breastfeeding self-efficacy, it may also be related simply to the planned pattern of feeding and reflect other variables, for example, cultural or family traditions. This possibility is supported by a study by Bonuck et al. (2005) highlighting the differences in planned feeding pattern by birth country. It is not clear then, whether early formula use predicts a shorter duration of feeding if the formula use was planned from the initiation of breastfeeding, or if it was unplanned. In a study by Cronenwett et al. (1992), a single, planned bottle of formula or expressed breast milk each day given by women who were breastfeeding did not negatively influence the duration of breastfeeding.

Approximately half of the infants in the current study received formula in the hospital, but the pattern of feeding in the hospital was not a significant predictor of duration or pattern of breastfeeding. This may suggest that these formula bottles were not in fact unplanned, and therefore did not influence the outcome as they might if the formula was given because of lack of confidence or fears about milk supply.

*Influences on Intended/Planned Feeding Pattern*

*Ethnicity.* In this study, the planned pattern of feeding differed significantly among ethnic groups (see Table 4). Women from the West Indies (self-identified as Cape Verdean, Haitian, or West Indian/Caribbean) were less likely to plan to breastfeed exclusively than the other ethnic groups. Women who self-identified as African-American or as being of multiple ethnic origins were more likely to plan to breastfeed exclusively. These differences in the intended pattern of breastfeeding among ethnic groups suggest that what a woman plans for feeding is likely to be related not only to breastfeeding self-efficacy, but also to family and cultural influences.

*Education.* In the current study, planned feeding pattern also differed significantly among women with different levels of education. There were no significant differences in education based on ethnicity in this sample. Women with more education were more likely to plan to breastfeed exclusively. When education, planned pattern of feeding and breastfeeding self-efficacy were included in a regression with breastfeeding pattern at one month postpartum as the outcome, breastfeeding self-efficacy and planned pattern of feeding were significant, but education was not. Perhaps women with more formal education have access to resources which encourage exclusive breastfeeding and this



knowledge influences their decision-making as well as cultural or ethnic influences.

Further research with larger samples of women would be needed to clarify the relationship of education to breastfeeding pattern when breastfeeding self-efficacy is also considered.

*Household income.* There were significant differences in feeding plan based on income categories. While women with lower household incomes were more likely to choose combination feeding, and women in higher income categories were more likely to choose exclusive breastfeeding, women in the middle category of household incomes of \$41,000 to 60,000/year were equally as likely to choose exclusive or combination feeding. In addition, WIC eligibility was significantly associated with planning to combine breast and formula rather than exclusive breastfeeding. Since WIC eligibility is based both on household income and number of household members, perhaps women eligible for WIC were more likely to choose combination feeding because of the demands of a larger family. Because WIC provides formula to eligible families, the availability of formula may also influence the intended pattern of feeding. Interestingly however, half of the women in the sample who had seen lactation consultants in the first month postpartum were participating in WIC. The lactation consulting that they received was made available through their WIC office. This would suggest that participation in WIC could potentially be a positive influence on breastfeeding pattern and duration. Previous research has reported that lower socioeconomic status is negatively associated with breastfeeding (Dennis, 2002; Scott & Binns, 1999), and WIC eligibility is often used as a proxy for lower socioeconomic status (Libbus, Bush, & Hockman, 1997; Mitra, Khoury,

Hinton, & Carothers, 2004). More than half of the current sample was eligible for WIC. Although more women participating in WIC planned combination feeding rather than exclusive breastfeeding, perhaps this represents a trend toward more breastfeeding and away from exclusive formula feeding in this socioeconomic group. This would be supported by data from the Pregnancy Risk Assessment and Monitoring System (Ahluwalia et al., 2003), showing that increases in breastfeeding initiation were observed among black women and women who participated in the WIC program.

### *Maternal Employment*

Most of the women in this study were employed outside the home during the year prior to their pregnancy and in most cases, their income accounted for up to half of the household income (see Table 2). Only half of the employed women reported having a paid maternity leave. Previous research has suggested that working outside the home would be likely to negatively influence breastfeeding (Lindberg, 1996; McKinley & Hyde, 2004; Taveras et al., 2003). It might be expected then that employment variables would have a significant negative influence on breastfeeding duration and pattern in this sample of women.

In contrast to this assumption, none of the employment variables had a significant effect on breastfeeding duration or pattern. Although there is published research reporting that longer maternity leaves promote longer breastfeeding (Roe, Whittington, Fein, & Teisl, 1999), none addressed the issue of whether the leave is paid or not, so it is not clear what the expected influence of paid leave might be. Galtry (1997) addressed paid leave as a policy issue, suggesting that whether leave is paid or not is likely to have a major

influence on breastfeeding, particularly among low-income women. In addition, women who have more education and higher incomes appeared to be more likely to have a maternity leave (Galtry), perhaps because they have greater ability to negotiate leave, or have partners with sufficient income to provide support during maternity leave.

Perhaps many women who plan to return to work full time are focused on breastfeeding exclusively while on maternity leave, and therefore do not appear different statistically from those who are not employed outside the home. Women who reported having a maternity leave most frequently had 12 weeks of planned leave, so their work status may not have influenced the pattern of breastfeeding at one month, which would have been 2 months prior to the anticipated return to work. If full-time workers were aware of work policies that would support breastfeeding, this may have influenced their decision to breastfeed longer or more exclusively. This is supported by the research of Roe et al. (1999), who reported that breastfeeding decisions were made after employment decisions.

None of the employment variables predicted duration of breastfeeding in this sample. It is possible that any influence of employment on duration of breastfeeding would not be evident as early as one month postpartum, as only five women (3.5% of the sample at Time 2) had returned to work or school in the first month postpartum. Employment influences on breastfeeding may be more significant as women anticipate returning to work. Alternately, if breastfeeding decisions are made after employment decisions (Roe & al., 1999), the influence of employment may be on planned rather than actual duration.

The variable measuring paid maternity leave had missing data for 23 of the respondents. In addition, some of the respondents did not check a box for their answer, but wrote descriptive information about their maternity leave, describing how they planned to manage their employment, such as taking sick and vacation days for leave, working at home or changing jobs. It is likely that forcing a dichotomous response to having a paid leave or not did not capture the complexity of employment decisions and their impact on household income. More qualitative data about how women plan to manage their employment and their maternal role, including breastfeeding, would be needed to understand the nature of the influence of employment on breastfeeding.

It is also interesting to note that among the twelve women who could not be reached for follow-up, ten reported working full-time prior to the birth of the child at Time 1, and only three reported having a paid maternity leave. Nine of the women lost to follow-up were eligible for WIC, six had health insurance paid for by public sources, and six had 12 years or less of education. This could suggest that women were lost to follow-up in the study because they had to return to work prior to the data collection at Time 2 (one month postpartum), and so could not be reached. This early return to work may have been influenced by a lower socioeconomic status, as Galtry (1997) suggested.

#### *Network Support for Breastfeeding*

Based on previous research highlighting the importance of social support for successful breastfeeding (Humphreys et al., 1998; Raj & Plitcha, 1998), it was surprising that network support for breastfeeding as measured by the NSB had no significant relationship to either breastfeeding duration or pattern in this sample. Most women

reported at least an “average” amount of support (scored as a 2 on the NSB) or “very much support” (scored as a 3 on the NSB). This support, while important to the breastfeeding mothers, did not have a statistically significant relationship to the outcomes of breastfeeding duration or pattern in this sample.

However, when total support was entered into a linear regression analysis with breastfeeding self-efficacy as the outcome, it significantly predicted breastfeeding self-efficacy, such that higher levels of support were predictive of higher levels of breastfeeding self-efficacy. Similarly, Dennis (2006) found that women that perceived that they had more support in general, as well as from their partner and friends with children, had higher BSES scores. This is consistent with the theory of self-efficacy (Bandura, 1997). Social support and the social network would be a source of self-efficacy information, through the influence of vicarious experience, verbal persuasion and the emotional/affective benefit of having a network of support. Behavior, such as breastfeeding, which is influenced significantly by social norms, is particularly influenced by social support (Bandura), so that network support for breastfeeding would be expected to have an important impact on breastfeeding self-efficacy. This is supported by researchers who described the importance of the influence of the social network on breastfeeding practices for black women (Cricco-Lizza, 2005; Ludington-Hoe et al., 2002). In the context of both academic achievement (Bandura, 2002) and postpartum depression (Bandura, 1997), Bandura contended that social support is mediated through self-efficacy. This could also be the case with breastfeeding, so that breastfeeding self-efficacy mediates the effect of social support on breastfeeding outcomes.

A majority of the respondents were breastfed themselves as infants, had family members who had breastfed a child, and had seen infants being breastfed, so they had ample sources of vicarious experiences and modeling. Anecdotally, when the researcher introduced the study, many women were surprised to learn that black women had lower breastfeeding rates than white women, remarking that “where I come from, everyone breastfeeds their babies—that’s what we do.” For these women, breastfeeding was a normative behavior. Many women also identified friends with children and breastfeeding experience as supportive of them. The opinions of their mother and their baby’s father were important to many respondents as well, and this could have been a source of verbal persuasion that influenced breastfeeding. The direction of the influence would depend on the nature of the advice or support. Women with a strong support network during the early postpartum period would also be expected to experience a positive emotional/affective state from receiving such support. All of this support would then be reflected in the scores of the breastfeeding self-efficacy measure. This possibility is strengthened by the statistical analysis showing that support did not have a direct effect on breastfeeding duration and pattern, but it did have a significant relationship to breastfeeding self-efficacy.

In the development of the Breastfeeding Self-Efficacy Scale, items were initially included to measure a perception of a mother’s perception of support from family and friends, but these items were deleted based on a factor analysis (Dennis, 2003). It was suggested that the reason for this was that perceived support was important for mothers making the decision to breastfeed, but once the decision was made, the support no longer

affected breastfeeding self-efficacy (Creedy et al., 2003; Torres et al., 2003). This may have been the case in this sample as well, as breastfeeding self-efficacy and network support were both measured at the same time in the early postpartum period. Only women who had already reported an intention to breastfeed were recruited into the study, so perhaps the influence of social support on their initial self-efficacy reflected an influence on their decision to breastfeed. This would explain why the level of support measured in the early postpartum period (Time 1) did not influence the outcomes at one month postpartum (Time 2), while self-efficacy was a significant predictor of the outcomes of both breastfeeding duration and pattern.

Measuring both network support for breastfeeding and breastfeeding self-efficacy was helpful in clarifying the role of support to breastfeeding outcomes. Network support for breastfeeding predicted breastfeeding self-efficacy, but did not appear to predict breastfeeding duration or breastfeeding pattern in this sample. Measuring network support for breastfeeding was also useful in identifying the individuals that each woman found supportive. Assessing the network available for breastfeeding support could be used to provide care and anticipatory guidance to women about resources for breastfeeding support, and to focus interventions on the most significant members of the network for an individual woman. Humphreys et al. (1998) recommended including family members in breastfeeding education, as women without breastfeeding experience who heard about breastfeeding from several sources were more likely to choose to breastfeed. Khoury, Mitra, Hinton, Carothers, and Sheil (2002) found that when women's partners were included in watching a breastfeeding video, the partners were

more likely to encourage breastfeeding. If interventions increased the amount of network support for breastfeeding, they would be likely to have a positive influence on breastfeeding self-efficacy. While breastfeeding support is clearly important to breastfeeding outcomes, it is more easily accounted for in a measure of breastfeeding self-efficacy rather than as a direct influence.

#### *Previous Breastfeeding Experience*

Nearly half of the sample had previous breastfeeding experience, and women who had previously breastfed at least one child had significantly higher levels of breastfeeding self-efficacy than women without any previous experience. Because enactive mastery, or the experience of prior success, is the most influential source of self-efficacy (Bandura, 1997) this finding was expected. However, it is also an important clinical consideration. Breastfeeding self-efficacy has been shown to be an important variable predicting longer breastfeeding duration and more exclusive breastfeeding. Improving breastfeeding outcomes would involve ensuring that first time mothers get all of the resources and help required to plan to breastfeed and to be successful in meeting their breastfeeding goals. Mothers with successful breastfeeding experience are then more likely to breastfeed again, and they can provide important role models for first-time mothers. The importance of observing other women breastfeeding and having their support will then enhance the breastfeeding self-efficacy of first-time mothers, thereby providing a positive influence on breastfeeding outcomes.



*Maternal Age*

Age was not a significant predictor of breastfeeding outcomes in this study. Interestingly however, women who were between 26 and 34 years old did appear to be more likely to be continuing to breastfeed at one month postpartum ( $p = .07$ ) as compared to women 35 and older. The difference between women who were between the ages of 18 and 24 and those 35 and older was not significant. It is possible that in a larger sample, the influence of age would have been more significant. The differences in significance levels between different age categories suggested that the relationship between age and continuing to breastfeed was not linear. However, when age and/or age squared were entered into the model, there was still no statistically significant association between age and duration of breastfeeding.

Older maternal age has often been associated with longer durations of breastfeeding (Dennis, 2002), but in this sample, this was not demonstrated. It is possible that age is a marker for another underlying variable, or that the relationship of age to breastfeeding duration may differ by racial and ethnic groups. In this sample, the average age was 30.4 years (range 18 - 45). Similarly, using data collected about births to all racial groups of women in Massachusetts, it was reported that 54.5% of all births were to women over 30 years old (MA DPH, 2002b). In a sample of black women giving birth in Massachusetts (MA DPH, 2002a), it was reported that on average, black mothers were younger than white, non-Hispanic mothers, and that there were ethnic differences in the ages at which black women gave birth. African-American and Cape Verdean women had a larger percentage of births before the age of 20 than other ethnic groups of black women (MA

DPH, 2002a). There was no significant difference in age among ethnic groups in the current study. In this sample, African-American and Cape Verdean women had the lowest average breastfeeding self-efficacy scores.

Age was also not significantly associated with breastfeeding self-efficacy in previous studies using samples of Canadian women, with a mean age of 29 (range 18 - 44) (Dennis, 2002), and Australian women, with a mean age of 28.5 (range 18 - 41) (Blyth et al. 2002). However, age was significantly associated with breastfeeding self-efficacy in a sample of Polish women with a mean age of 28 (range 17 - 42) (Wutke & Dennis, in press), although the direction of the relationship was not reported. Larger studies which measure the relationship of breastfeeding self-efficacy and age on breastfeeding duration are needed with samples of women of different racial and ethnic backgrounds. Such data will be likely to provide more information to aid in the interpretation of this finding.

#### *Influence of Demographics on Breastfeeding*

The variables that have been associated with breastfeeding in previous research include age, marital status, education and socioeconomic status (Dennis, 2002). None of these variables predicted breastfeeding duration and pattern in this study. In addition, age, socioeconomic status and marital status were not predictors of breastfeeding self-efficacy. The variable with the clearest influence on breastfeeding outcomes was breastfeeding self-efficacy, rather than any demographic variable. Planned pattern of breastfeeding also was predictive of breastfeeding pattern.

Many of the studies reporting breastfeeding rates based on demographic variables (Callen & Pinelli, 2004; Forste et al., 2001) did not also measure psychosocial variables such as breastfeeding self-efficacy or planned pattern of feeding. Other studies report influences of breastfeeding self-efficacy on breastfeeding outcomes, but are limited in the racial and ethnic diversity represented in the sample (Creedy et al. 2003; Dennis & Faux, 1999). Breastfeeding is a complex health-promoting behavior, and is influenced by a variety of personal characteristics of the mother, demographic variables and structural factors such as employment (McKinley & Hyde, 2004). Based on the current study, the only significant variables influencing breastfeeding duration and pattern were breastfeeding self-efficacy and planned pattern of feeding. However, demographic and personal factors (previous breastfeeding experience, education, ethnicity and social support) had an impact on self-efficacy perceptions. Breastfeeding self-efficacy may be a mediator between these variables and breastfeeding outcomes. Bandura (2002) contended that economic conditions, socioeconomic status and family structure exert their influence on behavior through self-efficacy rather than directly. If self-efficacy is not measured, variables such as demographics and employment may appear to be direct influences on breastfeeding outcomes.

As mediator effects are tested with multiple regression analyses (Bennett, 2000), the use of the Cox model and ordinal logistic regression in this study did not allow for a statistical analysis of mediation. However, conceptually (Bandura, 2002) breastfeeding self-efficacy could mediate the effect of demographic variables such as education and ethnicity on the outcomes of breastfeeding duration and pattern.

It is important to note that this sample of black women was similar to other previously reported samples of Caucasian breastfeeding women (Callen & Pinelli, 2004) with regard to demographics, as the respondents were on average 30 years old, married or living with a partner, and well-educated. The sample was socio-economically diverse. More than half were eligible for WIC, and therefore of a lower socioeconomic status, but more than half reported a household income of over \$40,000/ year, so they are likely to be above the poverty guidelines for families in Massachusetts (Massachusetts Department of Health and Human Services, 2006). Many previous samples of black women included only those of lower socioeconomic status (Raisler, 2000; Underwood et al., 1997). In this sample, measures of socioeconomic status did not significantly predict breastfeeding duration or pattern.

The relative insignificance of socioeconomic variables to breastfeeding outcomes in this sample of black women could be related to the significance of breastfeeding self-efficacy when these other socioeconomic and demographic variables are controlled. However, it may also be related to the difficulty of distinguishing the effects of race and socioeconomic status on breastfeeding outcomes. Timbo et al. (1996) reported that breastfeeding rates in black women increased with increasing age, education and income. It is possible that the low breastfeeding rate among black women may be more reflective of socioeconomic status than any variability related to racial/ethnic factors. Grummer-Strawn and Darling (2006) reported that for both black and white women, older maternal age, higher maternal education, being married and living in the Northeast were all positively associated with breastfeeding duration.

Although socioeconomic status (SES) is important to understanding health outcomes, including breastfeeding outcomes, measuring SES is a complex and controversial topic (Lynch & Kaplan, 2000). In this study, socioeconomic status was not a single variable, but measured primarily by household income, education, source of health insurance, and eligibility for WIC. This is traditionally how SES is measured (Oakes & Rossi, 2003), but may not be an accurate measurement for health research. It is possible that racial/ethnic health disparities may not in fact, be related to behavioral choices as much as structural constraints or a form of racial discrimination (Oakes & Rossi).

The significance of the finding that women who had private health insurance had significantly lower mean BSES scores is not clear. Having private health insurance rather than government-provided insurance generally indicates a higher socioeconomic status. However, in this sample, average breastfeeding self-efficacy scores did not differ by household income, which is also a measure of socioeconomic status. It is possible that women with health insurance provided by public sources were also more likely to be eligible for WIC, and thus had access to a lactation consultant, while lactation consulting may not have been covered by private health insurance. Perhaps women with private health insurance were more likely to be employed outside the home, and the length or availability of maternity leave was an influence on their breastfeeding self-efficacy. Further study is needed to understand the influence of socioeconomic variables on breastfeeding self-efficacy.

None of the results of this study suggested any major differences in breastfeeding characteristics or outcomes in this sample of black women compared to studies of other racial groups such as Australian, Canadian, Puerto Rican, Mandarin or Polish women. Differences in breastfeeding characteristics related to ethnicity, included planned pattern of breastfeeding and breastfeeding self-efficacy do appear to be important based on the results of this study. Larger studies of black women that include women of diverse ethnic groups, including U.S. and foreign-born women, are needed to understand better the influence of both race and ethnicity on breastfeeding outcomes.

Mean breastfeeding self-efficacy scores as measured in this study by the BSES-Short Form (BSES-SF) were compared to other reported samples (see Table 8). In each of the samples, women with previous breastfeeding experience had significantly higher BSES scores. Both the current sample and the Canadian sample (Dennis, 2002), showed BSES scores that were higher for those who were breastfeeding exclusively at one month postpartum, lower for those who were combination feeding, and lowest for those who had weaned by one month. Participants in the three groups (see Table 8) are likely to have had very different influences on feeding practices based on culture, ethnicity, country of origin, tradition, public policy, hospital policies and geographic differences, and yet the relative differences in BSES scores based on breastfeeding pattern and experience were similar. Not enough data from the samples compared (Dennis, 2002; Wutke & Dennis, in press) were published to be able to compute a statistical analysis of differences of means between the samples. Such information would be useful to obtain by further study, as

differences in mean BSES may reflect different variables that influence self-efficacy, and suggest areas for clinical intervention.

#### *Influence of Mode of Delivery on Breastfeeding*

Dennis (2003) found significant differences in BSES scores based on mode of delivery, with women having lower BSES if they had a Cesarean birth, but no differences by age, marital status, education or income. Wutke & Dennis (2006) found a relationship between age and self-efficacy, and lower self-efficacy in mothers who gave birth by Cesarean section, but no differences by marital status, education or income. In the current sample, there were no differences in BSES by age, marital status, education or mode of delivery.

#### *Predictors Amenable to Intervention*

Breastfeeding self-efficacy and planned pattern of breastfeeding, the significant variables influencing breastfeeding outcomes in this study, can be considered psychosocial variables. Psychosocial variables are likely to be amenable to intervention, and this finding could have tremendous clinical significance. Demographic variables are interesting, and can identify specific groups for intervention, but in general, demographic variables are not easily modified.

Self-efficacy and intention (planned pattern of breastfeeding) may be amenable to intervention by health care providers. Although health care providers may not be considered part of the social support network, eighty-seven percent (87%) of the respondents reported that a health care provider's advice was an important factor in their breastfeeding decision. This is consistent with previous research (Beal et al., 2003;

Bentley et al., 1999). It is important to note however, that most of the respondents (67%) had made the decision to breastfeed prior to pregnancy, so efforts to promote breastfeeding must begin before the prenatal care period.

### Limitations

The study was limited by the size of the sample. Based on an a priori power analysis, a sample of 150 women was planned. Although 175 women consented to participate, only 155 of those consenting returned the initial questionnaires at Time 1. As 12 women were unable to be reached for follow-up, the sample size was reduced to 143 at Time 2. Missing data for some of the respondents reduced the sample size to 137 for the analysis. No data were collected on the women (41% of those approached) who declined participation in the study, so it is not known if those who declined differed in any way based on demographic variables or their perception of breastfeeding self-efficacy. Women who could not be reached for follow-up were more likely to be eligible for WIC (50%), receiving publicly funded health insurance (50%), have 12 years or less of education (50%) and been working full time prior to the birth of their infant (83%). Only three of the women who could not be reached had reported having a paid maternity leave at the Time 1 measure. There may have been socioeconomic and employment differences between the women who remained in the study and those who could be reached for follow-up.

The target population for this study was black women living in Massachusetts. Although nearly one-fourth of the births to black women occurred at the hospital where the participants delivered (MA DPH, 2002a), the results may not be generalizable to all



black women in the state. The largest number of black women in Massachusetts live in Boston (MA DPH), and this was true of the current sample as well. Selected demographic variables were compared to a sample of all black women giving birth in Massachusetts in 2004 (Table 1). Statistical tests of the differences in the two samples must be interpreted with great caution due to the large size differences between the samples. These data showed that the current sample was more highly educated than the Massachusetts sample. The proportion of married women in the current sample was slightly larger than the Massachusetts sample. There were variations in the proportion of ethnic groups, with the sample population for this study having a greater percentage of West Indian/Caribbean women and Cape Verdean women. However, in the Massachusetts sample, 70% of Cape Verdean women identified themselves as “other” rather than “black” and were therefore not included in the sample (MA DPH, 2004). The differences noted in the proportion of Cape Verdean women in the current sample compared to the Massachusetts sample may be due to this factor. There were a greater proportion of women who self-identified as Hispanic in the current sample than in the Massachusetts sample. Although income data were not available for comparison, the current sample had fewer women (38% of sample) whose health insurance was from public sources compared to 60% of women in the Massachusetts sample, suggesting that the socioeconomic status of the sample was higher when compared to all black women giving birth in Massachusetts.

While the sample was large enough to detect the significance of breastfeeding self-efficacy to the outcomes of breastfeeding duration and pattern, there were not enough

participants in the sample to analyze each ethnic group individually. The results of the study, as well as data on Massachusetts births in 2004 (MA DPH, 2006), suggest that there are differences in breastfeeding characteristics among ethnic groups.

Data were not collected on whether women were born in the United States and if not, how long they had lived in the United States. In the Massachusetts sample (MA DPH), a majority of the women in ethnic groups other than African American were born outside of the United States, so these data may have been significant. A larger sample of women of varying races and ethnicities, and data about country of birth and immigration status, would be needed to identify whether these variables are significant predictors of breastfeeding outcomes. In addition, this study did not compare black women to other racial groups, and therefore conclusions about the differences between black women and other groups cannot be made.

The study was limited to women who had given birth to full-term infants. Infants who are born preterm benefit from breastfeeding, but breastfeeding can pose more challenges to these high-risk infants and their mothers (Callen & Pinelli, 2005). Many black infants are born preterm (DHHS, 2002, MA DPH, 2002b) so studies are needed that address the unique challenges to breastfeeding self-efficacy and breastfeeding outcomes in preterm or high risk infants.

Analysis of the influences of employment variables on the duration of breastfeeding was limited in this study, as the follow-up occurred at only one-month postpartum, prior to when most women return to work. More information about employment and breastfeeding outcomes will be gained as the longitudinal data up to six

months postpartum from the larger study are collected and analyzed. Many women will have returned to work by the six month measurement point. In addition, data are being collected about the type of work that women do in order to better analyze the influence of employment variables on breastfeeding outcomes. In this study of outcomes measured at one month postpartum, it was not possible to thoroughly analyze the influence of planned duration of feeding in this sample, as data collection did not continue until the planned weaning time reported by respondents. Influences on planned duration of breastfeeding will also be analyzed further in the larger study extending to six months postpartum.

Women were identified as eligible for the study by the postpartum nurses, and at the request of the Human Research Committee of the hospital, the nurse was the first person to mention the study and ask for permission for the researcher to enter the room. It is possible that bias was introduced to the study by the need to rely on the postpartum nurse's identification of potential participants, as the nurse may have consciously or unconsciously selected only participants who were breastfeeding well. Different nurses may also have represented the study in different ways, influencing how many women were willing to allow the researcher to explain the study. However, no information was available on women who were not approached for the study.

The study is limited in that the sample included only women who had already stated an intention to breastfeed. Studies that include women who intend only to formula feed would be useful to determine differences in characteristics between those who plan to breastfeed and those who plan to formula feed. Understanding how women make their infant feeding decision could suggest where to focus interventions to increase the

breastfeeding rate, or to increase the level of exclusivity in those who are planning to breastfeed in combination with formula feeding.

## CHAPTER V: CONCLUSIONS

### Breastfeeding Self-Efficacy

The findings of this study indicated that breastfeeding self-efficacy in the first week postpartum was a significant predictor of breastfeeding duration and pattern at one month postpartum in this sample of black women of varying ethnicity, age, socioeconomic and employment status. Higher levels of breastfeeding self-efficacy were associated with longer duration and more exclusive patterns of breastfeeding. The hypotheses of this study were supported. The findings are also consistent with previous studies of different racial/ethnic groups. While the influences on self-efficacy may differ among racial/ethnic groups, self-efficacy is an important predictor of breastfeeding outcomes.

Measuring breastfeeding self-efficacy could identify groups at risk for shorter durations and less exclusive breastfeeding. As the amount of breastfeeding is important to health outcomes, self-efficacy theory could be used as a basis for planning interventions to increase the amount and duration of breastfeeding. Measuring changes in breastfeeding self-efficacy may be useful in evaluating outcomes of interventions to promote breastfeeding.

Other variables identified in previous research that influence breastfeeding outcomes were not significant in this analysis, including income, education, pattern of feeding during postpartum hospitalization, marital status, mode of delivery, maternal employment, and breastfeeding support.

### Planned/Intended Pattern of Breastfeeding

Planned/intended pattern of breastfeeding (exclusive or in combination with formula) was an important predictor of breastfeeding pattern, in addition to breastfeeding self-efficacy. Planned pattern was also a significant influence on BSES. Planned pattern of breastfeeding remained significant to the outcome of the breastfeeding pattern at one month postpartum even if breastfeeding self-efficacy was not entered into the regression. The planned/intended pattern of breastfeeding is a variable which is potentially modifiable. Since the amount of breastfeeding appears to be related to health outcomes (Raisler et al., 1999), attention should be focused on the planned pattern as well as breastfeeding self-efficacy, in order to encourage more exclusive breastfeeding. A recent survey done in 2003 and reported by Li, Rock, and Grummer-Strawn (2007) indicates that respondents were increasingly more likely to agree that formula is as good as breast milk when compared to a similar survey conducted in 1999. Such a perception is contradictory to medical evidence supporting the superiority of human milk for infant nutrition (AAP, 2005). However, the perception that formula and breastfeeding are equal choices may influence how a woman plans for infant feeding, including how exclusively and for how long she intends to breastfeed.

Planned pattern of infant feeding appears to be influenced by education, ethnicity, and may also be influenced by employment variables. The influence of introducing formula on the duration of breastfeeding may differ depending on whether the formula bottles are planned or unplanned. This is a variable which is clearly important. More evidence-based knowledge is needed about how women make the decision about

their planned pattern of breastfeeding, and if there is a different influence on breastfeeding duration depending on whether the formula bottles were planned or unplanned. This would help to plan appropriate and individualized clinical interventions.

#### Race and Breastfeeding

While this study did not compare the sample of black women to samples with other racial groups, higher levels of breastfeeding self-efficacy predicted longer duration and more exclusive breastfeeding in this group of black women as well as in other previously reported samples. Differences in planned pattern of feeding among ethnic groups in this sample suggest that the ethnicity may be more significant than race in breastfeeding outcomes. Differences in mean breastfeeding self-efficacy scores between this sample and other reported samples, and differences in variables influencing breastfeeding self-efficacy among samples suggest that there may be racial and ethnic differences in breastfeeding behaviors, but these do not appear to be as important to breastfeeding duration and pattern as breastfeeding self-efficacy.

## CHAPTER VI: RECOMMENDATIONS

### Recommendations for Research

#### *Breastfeeding Self-Efficacy and Breastfeeding Duration and Pattern*

Research measuring the effect of breastfeeding self-efficacy on breastfeeding duration and pattern should be conducted with other larger, diverse samples of black women. It may be helpful to compare racial/ethnic groups with regard to their breastfeeding self-efficacy to determine if there are differences in how or to what degree breastfeeding self-efficacy influences outcome in different groups of women.

Breastfeeding self-efficacy should be studied with women of different socioeconomic groups, such as teens or low-income women, to see if self-efficacy is predictive of breastfeeding outcomes in more at-risk groups. Translating the BSES-SF into Portuguese and Creole would allow for more research among groups of black women. In data reported on births to black mothers in Massachusetts (MA DPH, 2002a), 43% of Haitian mothers and 25% of Cape Verdean mothers reported that they preferred a language other than English to read or discuss health-related materials.

Sources of breastfeeding self-efficacy information are an important area for future research as well, as these sources appear to differ based on racial and cultural factors. In order to influence self-efficacy in a group at risk for poorer breastfeeding outcomes, it would be important to know how these breastfeeding self-efficacy beliefs are formed, so that interventions can be focused on the most influential sources of information. The importance of previous mastery in developing a perception of self-efficacy is supported



by the results of this and other studies, as women who have previously breastfed a child have higher levels of breastfeeding self-efficacy. Perceptions of self-efficacy are also formed by vicarious experience according to Bandura (1997). The importance and influence of vicarious experiences such as role modeling, peer support, family traditions and the social context for example, could be measured to determine the impact of these factors of the development of breastfeeding self-efficacy. As social persuasion is also a source of efficacy information, it would be important to study what sources and types of social persuasion would be useful in increasing a woman's sense of breastfeeding self-efficacy. In particular, it would be helpful to note the impact of the advice of health care providers in enhancing self-efficacy in order to plan the most effective means of encouraging breastfeeding in health care settings. As psychological and affective states also inform self-efficacy, it is likely that postpartum depression, as well as pain, anxiety and fatigue would have an influence on breastfeeding self-efficacy. The nature of this influence should be studied, as these factors are also potentially modifiable.

Understanding the strength of the relationship of these factors to the development of breastfeeding self-efficacy would be helpful. Nursing interventions to provide comfort, support and to promote adequate rest are an important part of the care of a postpartum client, and may also improve breastfeeding self-efficacy. Dennis (2006) found that maternal anxiety predicted lower breastfeeding self-efficacy, and that satisfaction with pain management during labor and satisfaction with postpartum care predicted higher levels of breastfeeding self-efficacy. Further studies with diverse groups to describe

predictors of breastfeeding self-efficacy may suggest interventions to promote breastfeeding by modifying physiological and affective states.

As the results of this study and self-efficacy theory suggest that breastfeeding self-efficacy may be a mediator between demographic variables and breastfeeding outcomes such as duration and pattern, research should be designed to test this hypothesis.

Understanding the relationships between these variables will help to determine where nursing interventions to improve breastfeeding outcomes would have the greatest effect.

#### *Influence of Race and Ethnicity on Breastfeeding Outcomes*

The findings of this study suggest that there may be ethnic differences in breastfeeding outcomes. Traditionally, all black women have been placed together in one category and “black” is often equated with “African American”, although many different subgroups exist. In a recent study (Bonuck et al., 2005), some respondents identified themselves as “other” and then reported that they were from a West Indian country, highlighting the need to distinguish between different countries of origin, rather than grouping all women of similar skin color in one category. This was also noted in Massachusetts (MA DPH, 2002a) when black Cape Verdean mothers identified themselves as “other”. Further studies should be done with large enough samples to identify and distinguish differences among ethnic groups, in order to provide appropriate and individualized interventions. It is also important to report whether respondents were born in the United States, and how long they have lived here, as this appears to influence breastfeeding plans (Bonuck et al.). Studies to compare demographically similar groups of black women with other racial/ethnic groups would also be needed to determine

whether the low breastfeeding rate reported for black women is an accurate representation of such a diverse racial group.

In addition, more research is required which will help distinguish if race is in fact a significant variable influencing breastfeeding outcomes, as the data seem to indicate, or if some measure of socioeconomic status (including education) is the more salient variable. It is important that breastfeeding promotion not be based on incorrect assumptions about a racial group. Further evidence related to what variables are most important to breastfeeding and breastfeeding self-efficacy in particular is required to avoid biased assumptions based on race. Clear understanding of variables influencing breastfeeding outcomes is needed to design sound and focused interventions.

#### *Predictors of Breastfeeding Duration*

Studies that continue to follow women of diverse race and ethnicity throughout the first year postpartum are needed to analyze more completely the predictors of breastfeeding duration, and the reasons why women wean their infants. It would be important to follow women until the time of weaning to allow for a more accurate analysis of whether or not a respondent breastfed until the time she had planned. It would also be helpful to determine how long women who had not stated an intended duration actually continued to breastfeed. In the current study, 36% of the respondents stated that they did not know how long they intended to breastfeed their babies. Understanding the influences on duration of breastfeeding, the influences on how long a woman plans to breastfeed, and what barriers women experience in meeting their goals, if any, will help to focus interventions that could encourage longer durations of breastfeeding.

*Education about Health Benefits of Breastfeeding*

Studies to distinguish different health benefits of breastfeeding related to the amount (both pattern and duration) would be helpful to provide evidence-based information to women and health care providers, so that an informed choice can be made about infant feeding. Many Americans are not convinced of the benefits (Li et al., 2007), so accurate information about health benefits must also be made available to the public. While it is known that the amount of breastfeeding influences the health benefits, the amount of breastfeeding is measured differently among studies. The schema developed by Labbok and Krasovec (1990) to quantify the amount of breastfeeding would be helpful to allow for more accurate comparison of research studies.

*Influence of Maternal Employment*

Research that collects breastfeeding data throughout the first year of an infant's life is recommended to analyze various employment variables and their relationship to breastfeeding, including the length of maternity leave, the gender mix of the employment setting, the number of hours of work and the nature of the employment. The information gained from such research should be used to plan maternity leave and workplace policies to allow for women to balance the need for work outside the home and breastfeeding their infant. This can prevent unnecessary early weaning related to employment.

*Planned Pattern of Breastfeeding*

Research into the duration and pattern of breastfeeding needs to include an assessment of the respondent's intended feeding duration and pattern. The planned pattern was a very significant predictor in this study of both breastfeeding pattern and

breastfeeding self-efficacy, but a woman's plan is seldom reported. More research is needed which includes information about intended duration and pattern. Without knowledge of the reasons for giving formula bottles, the influence of formula feeding on breastfeeding outcomes can not be accurately determined. The reason for giving formula bottles is also important in determining the most appropriate and culturally sensitive interventions to encourage more exclusive breastfeeding.

#### *Determining Critical Values of Breastfeeding Self-Efficacy*

The BSES-SF has been very useful in predicting breastfeeding outcomes. It is likely to be very helpful in identifying women at risk for early weaning. However, in order to be used clinically to identify women at risk, it would be important to determine if there are appropriate cut-off values for breastfeeding self-efficacy, so that identifying a woman with a particular BSES score would help plan interventions based on the level of her breastfeeding self-efficacy. It is not known how much of a change in the level of breastfeeding self-efficacy (either increased or decreased) would change breastfeeding outcomes. It is not known if there is a critical value for breastfeeding self-efficacy, below which weaning would occur, and above which breastfeeding would continue, or if there is a critical value above which most women are breastfeeding exclusively. Average breastfeeding self-efficacy scores for women in other reported samples with similar breastfeeding characteristics differed (Table 8) from the average scores in this sample. Research into how clinically meaningful such differences might be would enhance the clinical utility of the instrument. Further studies should be conducted to determine what, if any, are clinically useful ranges of BSES scores.

If it could be determined how much of a change in breastfeeding self-efficacy would change breastfeeding outcomes, the BSES-SF could be useful for evaluating breastfeeding interventions. As breastfeeding self-efficacy is known to predict longer and more exclusive breastfeeding, interventions to enhance breastfeeding self-efficacy could be evaluated by the presence or absence of a significant change in breastfeeding self-efficacy as measured by the BSES.

#### *Research among Diverse Racial/Ethnic Groups*

As there appears to be differences in mean BSES among different racial/ethnic groups, diverse groups of women should be studied using the BSES, and the variables which influence self-efficacy analyzed. Based on theory (Bandura, 1997), sources of efficacy information may differ based on cultural influences, including race and ethnicity. Knowing what information contributes to self-efficacy would help to focus interventions based on the most important influences for a particular group of women. For example, breastfeeding self-efficacy may be influenced by the availability of role models for some groups, while it may be influenced more by employment characteristics in another group.

#### *Health Care Provider Influences*

In the current study, health care providers were an important part of a woman's decision-making about infant feeding, and women perceived their pediatricians and other health care providers as very supportive. Previous research findings on the importance of the health care provider in a woman's decision to breastfeed is somewhat mixed but seems to suggest that women will breastfeed longer if they perceive that their provider prefers breastfeeding. Studies which address the influence of health care providers and

the most productive time for interventions to promote breastfeeding should be conducted. As decisions about breastfeeding are frequently made prior to pregnancy, the influence of primary care providers as well as women's health care providers would be important to measure. This would aid greatly in planning the most appropriate method and time to encourage breastfeeding.

### Recommendations for Clinical Practice

#### *Developing Interventions to Promote Breastfeeding*

The importance of breastfeeding self-efficacy is evident from this and other studies, so nursing interventions should be developed based on self-efficacy theory. As there are many sources of efficacy information, strategies could be determined to strengthen the effect of various sources. For example, women without peer support could be directed to resources where they meet and get assistance from other more experienced mothers, allowing for them to have more role models and thus more vicarious experience. Higher levels of network support for breastfeeding predict higher levels of breastfeeding self-efficacy, so involving the woman's significant network members in the education and planning for breastfeeding could enhance outcomes.

Successful experiences will enhance breastfeeding self-efficacy through a growing sense of mastery, so during the maternity hospitalization, every opportunity should be given to allow for positive first experiences of breastfeeding. This could involve providing information about normal newborn behaviors and how to identify readiness-to-feed cues. Choosing the appropriate time to breastfeed based on the infant's behavior would enhance success. When nurses are providing teaching and support for postpartum

women, they should consider not simply information and technical support, but encouragement (verbal persuasion) which will enhance a woman's sense of breastfeeding self-efficacy. When a woman asks to give her infant formula, the reason for the request should be explored, so that if the motivation is related to a lack of confidence in her ability to breastfeed, the underlying self-efficacy issues can be addressed as well as the need for feeding the infant.

The influence of vicarious experience on self-efficacy is enhanced when an individual is comparing him/herself to someone judged as being similar to him/her (Bandura, 1997). This suggests that breastfeeding support and teaching may be more useful when it comes from an individual of the same racial or ethnic group. A recent study (Anderson, Damio, Chapman, & Perez-Escamilla, 2007) in a sample of Hispanic women reported that there were differences in the response to a peer counseling intervention for breastfeeding based on ethnicity. Differences among ethnic groups in this study suggest that this phenomenon would be likely in a sample of black women as well, so interventions such as providing peer support would need to be planned based on accurate knowledge and understanding of the groups being targeted for the breastfeeding intervention. Finding and developing breastfeeding support groups led by experienced black mothers would capitalize on the effectiveness of vicarious experience as an influence on breastfeeding self-efficacy. Such groups could be based in community health centers, as clients of the health center would likely be from the same neighborhood, and experienced breastfeeding mothers could be easily identified by health care providers and supported in a way that would help them to provide support to their



peers. Churches may also be an appropriate setting for providing breastfeeding support groups or finding peers who could provide breastfeeding support and encouragement. WIC offices have also been found to be a helpful source of breastfeeding support (Cricco-Lizza, 2005).

#### *Encouraging More Exclusive Breastfeeding*

As planned pattern of breastfeeding predicts the actual pattern of feeding as well as breastfeeding self-efficacy, efforts should be focused on encouraging women to consider a more exclusive pattern of breastfeeding. Most of the women in this study had made their infant feeding decision prior to pregnancy. Although they reported that the advice of their health care provider was important, the topic of infant feeding may not have been addressed by a health care provider prior to a woman's entry into prenatal care. Women may not be knowledgeable about the health benefits of breastfeeding, or aware that the "dose" of breastfeeding is important as well. Early introduction of solid foods (and thus less breastfeeding) is a traditional practice for some racial/ethnic groups (Ludington-Hoe et al., 2002), and health provider discouragement of this practice may be effective, thus promoting longer and more exclusive breastfeeding.

As planned pattern of breastfeeding is important to breastfeeding outcomes, programs which provide education and encouragement to breastfeed should begin prior to pregnancy. Health classes in schools and public education programs should include information about the importance of breastfeeding. As the social network appears to influence breastfeeding self-efficacy and thus breastfeeding outcomes, education and

encouragement should be directed to all members of a community or social network, not just to childbearing women.

Once prenatal care is initiated, a woman's intended feeding pattern should be assessed, and individual advice can be provided which might encourage more exclusive breastfeeding, or provide anticipatory guidance about how to manage breastfeeding so that women may meet their breastfeeding goals. Information about the recommended duration of breastfeeding (AAP, 2005) could also be offered to encourage longer durations of breastfeeding. It is important to provide education about breastfeeding which is realistic and addresses strategies for overcoming common problems and barriers, so that a woman's perception of breastfeeding self-efficacy is based on accurate assessment of the tasks and skills involved in initiation and sustaining breastfeeding. As the results of this study suggest that the planned pattern of feeding is influenced by ethnicity, this support and education needs to be provided in a culturally sensitive and individualized manner. It is important to remember that both the planned pattern of breastfeeding and breastfeeding self-efficacy predict breastfeeding pattern, so interventions can be focused on both variables as needed.

### Recommendations for Policy

#### *Public Education*

National health policy objectives should include public education about the importance of breastfeeding, and the most advantageous pattern and duration of breastfeeding. These messages should be designed to be culturally sensitive, as the influences on breastfeeding differ between groups. The interventions should be designed

based on self-efficacy theory, and evaluated as to their effectiveness in encouraging longer durations and more exclusive patterns of breastfeeding. Education should be focused on entire communities, not simply childbearing women, and should begin well prior to childbearing, as beliefs and attitudes about infant feeding are generally formed prior to conception. Such education could be provided in health classes in schools and health centers, as well as during appointments for preventative health care for adolescents and women. Articles about the health benefits of breastfeeding could be written for newspapers and other publications such as women's magazines.

### *Employment Policies*

The influence of employment on breastfeeding has been addressed in previous research and should continue to be addressed with various groups of people in various employment settings. Public funding should be made available to address the effect of employment variables, such as the length of maternity leave, the flexibility of work hours, or the availability of workplace lactation support on breastfeeding outcomes. The health benefits of breastfeeding should be described in economic terms to help lawmakers understand the public health importance of facilitating breastfeeding.

### *Hospital Policies*

In this study, women with previous breastfeeding experience had higher breastfeeding self-efficacy. This illustrates the importance of targeting support, assistance and encouragement to women who are breastfeeding for the first time. If women are successful in breastfeeding their first baby, they are likely to breastfeed subsequent children as well. The first measure of breastfeeding self-efficacy in this study was during

the postpartum hospitalization. Hospital policies that encourage breastfeeding, especially in primiparous mothers, would be likely to positively influence breastfeeding self-efficacy, and thus help to meet the goal of increasing breastfeeding duration and exclusivity. Support provided during the maternity hospitalization, as well as telephone support provided after discharge, would affirm the importance of successful breastfeeding to new mothers, and provide timely assistance to help overcome any problems that might arise. Being able to overcome difficulties and be successful at initiating breastfeeding would provide a strong enhancement to a woman's perception of breastfeeding self-efficacy, which will in turn encourage longer durations of breastfeeding.

Women who have had a prior experience of breastfeeding that was not successful may be particularly at risk for not attempting or not continuing to breastfeed subsequent children. These women would most likely need counseling and support during their pregnancy as they make an infant feeding decision, and as they attempt to breastfeed again. Failure itself may not necessarily lower breastfeeding self-efficacy perceptions. How self-efficacy is affected will depend on how the prior experience of breastfeeding is interpreted and weighed (Bandura, 1997). Health care providers may be able to provide insight in discussing prior breastfeeding experiences that will alter the perception of the experience in a way that could enhance self-efficacy for initiating and sustaining breastfeeding with another child.

## Conclusion

Higher levels of breastfeeding self-efficacy have been shown to predict longer duration and more exclusive patterns of breastfeeding in this sample of black women, as well as in previous research with other populations. Health policy goals include a focus on increasing breastfeeding duration. Because breastfeeding self-efficacy is such an important predictor of breastfeeding outcomes, it is likely that interventions to increase a woman's breastfeeding self-efficacy will have a positive influence on both duration of breastfeeding and a more exclusive pattern of breastfeeding. Research, clinical practice and policy based on self-efficacy theory should be undertaken to develop and evaluate interventions to increase breastfeeding self-efficacy.

This is the first study of breastfeeding self-efficacy in black women. The results confirmed that in this sample, as well as in previously researched groups, breastfeeding self-efficacy is an important predictor of breastfeeding duration and pattern. Measuring breastfeeding self-efficacy using the BSES-SF appears to be useful for diverse racial and ethnic groups. By studying and understanding the different sources of breastfeeding self-efficacy information, interventions to improve breastfeeding self-efficacy can be individualized to the unique characteristics of each group. The effectiveness of such interventions could be evaluated by assessing changes in breastfeeding self-efficacy as well as outcomes of increasing duration and exclusivity.

More research is needed with samples of black women of varying ethnicity and socio-economic status, as well as black women from other geographic areas. Targeting interventions to women in groups at risk for not breastfeeding will be needed to improve

the breastfeeding rate among black women. However, additional studies are needed to determine what groups of women are at risk, rather than looking at black women as a homogeneous group.

Breastfeeding self-efficacy appears to be a more important variable predicting breastfeeding outcomes than previously reported demographic variables. This should allow for more focus on breastfeeding self-efficacy, while using the demographic differences as a way to understand the social context of the women who are making an infant feeding decision. The health benefits of breastfeeding are compelling and encouraging breastfeeding is an important public health goal. Childbearing women have contact with nurses in a variety of outpatient and acute care settings, and this provides many opportunities for nursing interventions to promote breastfeeding through the enhancement of breastfeeding self-efficacy. There are groups, including populations of black women in the United States, who are at disproportionately higher risk for health problems such as heart disease, high blood pressure, diabetes, asthma and obesity. Endeavoring to increase breastfeeding duration and exclusivity among these families at risk is an intervention that can contribute toward reducing this health disparity. Such interventions will work toward improving the quality of life for all.

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Appendix A  
Breastfeeding Survey



Draft

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# Breastfeeding Survey

Month      Day      Year

Date

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Researcher Initials

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Draft

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## Feeding your New Baby

This survey asks about your thoughts and feelings about feeding your baby. There are no right or wrong answers.

1. How will you feed your new baby?

- ☐ Breastfeeding
- ☐ Formula (bottle) feeding only
- ☐ Both breast and formula feeding

2. About how long do you plan to breastfeed?

- ☐ For the following amount of time: 

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 weeks
- ☐ As long as the baby wants to breastfeed
- ☐ I do not know

3. When did you decide to breastfeed your baby?

- ☐ Before I was pregnant
- ☐ During the first three months (12 weeks) of my pregnancy
- ☐ Between the third to sixth month of my pregnancy
- ☐ Between the sixth and ninth month of my pregnancy
- ☐ After the baby was born

4. Were you breastfed when you were an infant?

- ☐ Yes
- ☐ No
- ☐ I don't know

5. Have any members of your family ever breastfed an infant?

- ☐ Yes
- ☐ No

6. Have you ever seen an infant being breastfed?

- ☐ Yes
- ☐ No

## 7. How important is each of the following to you as a breastfeeding mother?

	Not important	Slightly important	Important	Very Important
My personal experience	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
What most of my female relatives do	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
What most of my friends do	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Experience of women close to me	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The baby's father's opinion	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
My mother's opinion	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Health care provider's advice	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
My baby's health	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
My own health	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
It feels comfortable to me	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
My schedule (work or family responsibilities)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Something else	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Please describe				



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8. Please think about the five **most important** people in your life. Consider all the people who provide support for you.

Here is a list to help you think of the people important to you.

- spouse or partner
- family members
- relatives
- neighbors
- work associates
- school associates
- health care providers
- counselor
- therapist
- minister/priest/rabbi

The five most important people to me are:

(Feel free to use initials, nicknames or first names only if you prefer)

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_
5. \_\_\_\_\_

*On the next few pages, you will be asked to list the people again, and answer questions about each one individually.*



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Please answer the following questions about each of the people you just listed in question 8.

**For the first person you listed: What is her or his relationship to you?**

For example: my mother, my baby's father

1. \_\_\_\_\_

Please check your answers in the boxes to the right of the question.

Questions:	Not at all	A little bit	An average amount	Very much
How much does she or he provide emotional support in your decision to breastfeed?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
How important does she or he think it is to breastfeed your baby?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
How much does she or he know about breastfeeding?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
How much can you ask her or him for help with breastfeeding?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
How much will she or he support you if you experience problems with breastfeeding?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



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**For the second person you listed: What is her or his relationship to you?**

2. \_\_\_\_\_

Please check your answers in the boxes to the right of the question.

Questions:	Not at all	A little bit	An average amount	Very much
How much does she or he provide emotional support in your decision to breastfeed?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
How important does she or he think it is to breastfeed your baby?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
How much does she or he know about breastfeeding?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
How much can you ask her or him for help with breastfeeding?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
How much will she or he support you if you experience problems with breastfeeding?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



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**For the third person you listed: What is her or his relationship to you?**

3. \_\_\_\_\_

Please check your answers in the boxes to the right of the question.

Questions:	Not at all	A little bit	An average amount	Very much
How much does she or he provide emotional support in your decision to breastfeed?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
How important does she or he think it is to breastfeed your baby?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
How much does she or he know about breastfeeding?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
How much can you ask her or him for help with breastfeeding?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
How much will she or he support you if you experience problems with breastfeeding?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>





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**For the fourth person you listed: What is her or his relationship to you?**

4. \_\_\_\_\_

Please check your answers in the boxes to the right of the question.

Questions:	Not at all	A little bit	An average amount	Very much
How much does she or he provide emotional support in your decision to breastfeed?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
How important does she or he think it is to breastfeed your baby?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
How much does she or he know about breastfeeding?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
How much can you ask her or him for help with breastfeeding?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
How much will she or he support you if you experience problems with breastfeeding?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



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**For the fifth person you listed: What is her or his relationship to you?**

5. \_\_\_\_\_

Please check your answers in the boxes to the right of the question.

Questions:	Not at all	A little bit	An average amount	Very much
How much does she or he provide emotional support in your decision to breastfeed?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
How important does she or he think it is to breastfeed your baby?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
How much does she or he know about breastfeeding?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
How can you ask her or him for help with breastfeeding?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
How much will she or he support you if you experience problems with breastfeeding?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



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9. Please think about if there are any *other* people you expect will be able to help you with breastfeeding. If there are other people you haven't already listed, please name them here. (leave these lines blank if you have already listed everyone you expect to be able to help you.)

Other people who will be able to help me with breastfeeding

(please feel free to use initials, nicknames or first names if you prefer):

1. \_\_\_\_\_

2. \_\_\_\_\_

On the next few pages, you will be asked to list the people again, and answer questions about each one of them individually.

If you have not listed any other people above, please skip to question 10.



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Please answer the following questions about each of the people you just listed in question 9.

**For the first person you listed in question 9: What is her or his relationship to you?**  
(for example: friend, lactation consultant, childbirth educator)

1. \_\_\_\_\_

Please check your answers in the boxes to the right of the question.

Questions:	Not at all	A little bit	An average amount	Very much
How much does she or he provide emotional support in your decision to breastfeed?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
How important does she or he think it is to breastfeed your baby?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
How much does she or he know about breastfeeding?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
How much can you ask her or him for help with breastfeeding?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
How much will she or he support you if you experience problems with breastfeeding?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



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For the second person you listed in question 9: What is her or his relationship to you?

2. \_\_\_\_\_

Please check your answers in the boxes to the right of the question.

Questions:	Not at all	A little bit	An average amount	Very much
How much does she or he provide emotional support in your decision to breastfeed?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
How important does she or he think it is to breastfeed your baby?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
How much does she or he know about breastfeeding?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
How much can you ask her or him for help with breastfeeding?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
How much will she or he support you if you experience problems with breastfeeding?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



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10. Please answer the following questions about the *nurses* in the hospital where you delivered the baby.

**The nurses in the hospital where I delivered my baby:**

Please check your answers in the boxes to the right of the question.

Questions:	Not at all	A little bit	An average amount	Very much
How much do they provide emotional support in your decision to breastfeed?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
How important do they think it is to breastfeed your baby?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
How much do they know about breastfeeding?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
How much can you ask them for help with breastfeeding?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
How much do they support you if you are experiencing problems with breastfeeding?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



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11. Please answer the following questions about the baby's primary doctor or nurse (where you take your baby for check-ups and immunizations)

**My baby's doctor or nurse.**

Please check your answers in the boxes to the right of the question.

Questions:	Not at all	A little bit	An average amount	Very much
How much do they provide emotional support in your decision to breastfeed?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
How important do they think it is to breastfeed your baby?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
How much does he or she know about breastfeeding?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
How much can you ask them for help with breastfeeding?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
How much do they support you if you are experiencing problems with breastfeeding?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

### Breastfeeding Self-Efficacy Scale - Short Form

For each of the following statements, please choose the answer that best describes how confident you are with breastfeeding your new baby. Please mark your answer by marking the box that is closest to how you feel. There is no right or wrong answer.

- 1 = not at all confident  
 2 = not very confident  
 3 = sometimes confident  
 4 = confident  
 5 = very confident

Not at all  
confident

Very  
confident

- |  | <input type="checkbox"/> 1 | <input type="checkbox"/> 2 | <input type="checkbox"/> 3 | <input type="checkbox"/> 4 | <input type="checkbox"/> 5 |
|--|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|
| 1. I can always determine that my baby gets enough milk.                                       | <input type="checkbox"/>   | <input type="checkbox"/>   | <input type="checkbox"/>   | <input type="checkbox"/>   | <input type="checkbox"/>   |
| 2. I can always successfully cope with breastfeeding like I have with other challenging tasks. | <input type="checkbox"/>   | <input type="checkbox"/>   | <input type="checkbox"/>   | <input type="checkbox"/>   | <input type="checkbox"/>   |
| 3. I can always breastfeed my baby without using formula as a supplement.                      | <input type="checkbox"/>   | <input type="checkbox"/>   | <input type="checkbox"/>   | <input type="checkbox"/>   | <input type="checkbox"/>   |
| 4. I can always ensure that my baby is properly latched on for the whole feeding.              | <input type="checkbox"/>   | <input type="checkbox"/>   | <input type="checkbox"/>   | <input type="checkbox"/>   | <input type="checkbox"/>   |
| 5. I can always manage the breastfeeding situation to my satisfaction.                         | <input type="checkbox"/>   | <input type="checkbox"/>   | <input type="checkbox"/>   | <input type="checkbox"/>   | <input type="checkbox"/>   |
| 6. I can always manage to breastfeed even if my baby is crying.                                | <input type="checkbox"/>   | <input type="checkbox"/>   | <input type="checkbox"/>   | <input type="checkbox"/>   | <input type="checkbox"/>   |
| 7. I can always keep wanting to breastfeed.  | <input type="checkbox"/>   | <input type="checkbox"/>   | <input type="checkbox"/>   | <input type="checkbox"/>   | <input type="checkbox"/>   |
| 8. I can always comfortably breastfeed with my family members present.                         | <input type="checkbox"/>   | <input type="checkbox"/>   | <input type="checkbox"/>   | <input type="checkbox"/>   | <input type="checkbox"/>   |
| 9. I can always be satisfied with my breastfeeding experience.                                 | <input type="checkbox"/>   | <input type="checkbox"/>   | <input type="checkbox"/>   | <input type="checkbox"/>   | <input type="checkbox"/>   |
| 10. I can always deal with the fact that breastfeeding can be time-consuming.                  | <input type="checkbox"/>   | <input type="checkbox"/>   | <input type="checkbox"/>   | <input type="checkbox"/>   | <input type="checkbox"/>   |
| 11. I can always finish feeding my baby on one breast before switching to the other breast.    | <input type="checkbox"/>   | <input type="checkbox"/>   | <input type="checkbox"/>   | <input type="checkbox"/>   | <input type="checkbox"/>   |
| 12. I can always continue to breastfeed my baby for every feeding.                             | <input type="checkbox"/>   | <input type="checkbox"/>   | <input type="checkbox"/>   | <input type="checkbox"/>   | <input type="checkbox"/>   |
| 13. I can always manage to keep up with my baby's breastfeeding demands.                       | <input type="checkbox"/>   | <input type="checkbox"/>   | <input type="checkbox"/>   | <input type="checkbox"/>   | <input type="checkbox"/>   |
| 14. I can always tell when my baby is finished breastfeeding.                                  | <input type="checkbox"/>   | <input type="checkbox"/>   | <input type="checkbox"/>   | <input type="checkbox"/>   | <input type="checkbox"/>   |





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### All About You

Please answer the following questions about yourself:

1. What is your date of birth?

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 / 

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 / 

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2. Do you have any other children? ☐ yes ☐ no

If yes

How many?

--	--

children

3. Have you breastfed any other children? ☐ yes ☐ no

If yes

How many?

--	--

children

4. What is your relationship to the father of the baby? (Choose the answer that best describes your relationship)

- ☐ Married, living together
- ☐ Married, not living together
- ☐ Not married, living together
- ☐ Not married, not living together
- ☐ No married, no current relationship

5. How did you deliver your baby?

- ☐ vaginal birth
- ☐ Cesarean section (c/section surgery)

6. Would you describe yourself as Hispanic or Latina?

☐ Yes ☐ No



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7. How would you describe your family background?

*Please check **all** that apply.*

☐ Cape Verdean

☐ Haitian

☐ West Indian/Caribbean

☐ African

☐ African-American

☐ Multiple ethnic backgrounds

Please describe:

☐ Other

Please describe:

8. How do you support yourself and your family?

*Please check **all** that apply.*

☐ My work outside the home

☐ My partner's work outside the home

☐ Government assistance

☐ Other household members work outside the home

☐ Other: Please describe.

9. What is your approximate household income? (The total amount of income that all people in the household contribute from any source)

☐ \$10,000 per year or less

☐ \$11,000-20,000 per year

☐ \$21,000-30,000 per year

☐ \$31,000-40,000 per year

☐ \$41,000-50,000 per year

☐ \$51,000-60,000 per year

☐ \$61,000-70,000 per year

☐ \$71,000-80,000 per year

☐ \$81,000 or more per year



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10. Did you work outside the home during the past 12 months?

☐ Yes

☐ No

If no, please skip to next page.

11. What is your job? (Please describe your job title or the nature of your work)

--

12. On average, how many hours have you been working each week?

--	--

hours

13. Do you have a maternity leave?

☐ No

☐ Yes ——— If yes: a. How long is your maternity leave?

--	--

weeks

b. Are you being paid a salary during your maternity leave?

☐ Yes ☐ No

14. What percent of your household income comes from your own personal income?

☐ Less than 25%

☐ 26-50%

☐ 51-75%

☐ More than 75%

☐ I earn the only income in the household

15. In your work, what percent of the employees are women?

☐ There are 80-100% women (mostly women)

☐ There are 60-79% women

☐ There are 40-59% women (nearly equal)

☐ There are 20-39% women

☐ There are less than 20% women (mostly men)



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16. How many years of education do you have?

- ☐ Less than 12 (did not finish high school)
- ☐ 12 years (finished high school or GED)
- ☐ Some college, but did not graduate
- ☐ 16 years (graduated from college with a bachelor's degree)
- ☐ More than 16 years

17. What kind of health insurance do you have?

- ☐ Private insurance, self-pay
- ☐ Private insurance, through an employer
- ☐ Medicare
- ☐ Mass Health
- ☐ Free care
- ☐ I do not have any health insurance

18. Are you eligible for WIC (Women, Infant's and Children's Program)?

☐ No

☐ Yes

If yes, have you been to a WIC office yet?

☐ Yes

☐ No

19. What is your zip code?

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20. What is your baby's date of birth?

		/			/				
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**Appendix B**  
**Feeding Pattern Questions**

Subject number \_\_\_\_\_

Date \_\_\_\_\_

Age of infant \_\_\_\_\_

***Feeding pattern questions:***

How many times did you breastfeed the baby in the last 24 hours? \_\_\_\_\_

Do you use other feedings? Yes/no (*circle*)

If yes, how many of the feedings were bottle feedings? \_\_\_\_\_

-What was in the bottle? (formula, or expressed breast milk)

#formula bottles \_\_\_\_\_

# expressed breast milk bottles \_\_\_\_\_

How many of the feedings were something other than breast milk or formula? \_\_\_\_\_

-What was it? \_\_\_\_\_

Have you had any contact with the lactation consultant ? yes/no

What topics or problems did you address/discuss? \_\_\_\_\_

\_\_\_\_\_

Appendix C  
Recruitment Flyer

Many  
people  
encourage  
breastfeeding,  
but sometimes  
it isn't so  
simple

## QUESTIONS ?

Contact me :

Deborah McCarter-Spaulding,  
RNC, MS, IBCLC  
PhD candidate UMass Lowell

Or contact my faculty advisor :

Dr. Susan Reece  
Professor of Nursing  
University of Massachusetts Lowell



## © Planning on © Breastfeeding?



We'd like to hear from you !

A research study on breastfeeding  
in women of African descent





Appendix D  
Research Consent Form

# Partners HealthCare System Research Consent Form

Subject Identification

Template Version Date: June 2005

Protocol Title: Breastfeeding Self-Efficacy in Women of African Descent

Principal Investigator: Deborah McCarter-Spaulding, RNC, MS, PhD Candidate

Site Principal Investigator:

Description of Subject Population: Women of African descent

## About this consent form

Please read this form carefully. It tells you important information about a research study. A member of our research team will also talk to you about taking part in this research study. People who agree to take part in research studies are called "subjects." This term will be used throughout this consent form. If you have any questions about the research or about this form, please ask us. If you decide to take part in this research study, you must sign this form to show that you want to take part. We will give you a copy of this form to keep.

## Why is this research study being done?

The purpose of this research study is to learn about the decision to breastfeed and the experience of breastfeeding from the perspective of black women (women of African descent: Cape Verdean, Haitian, West Indian, Caribbean and African and African-American). Women describe many things that influence their decision about infant feeding. They also have varied experiences. Women often learn about parenting and infant feeding from their family and friends. This means that their thoughts and feelings about breastfeeding may be influenced by their racial, ethnic and cultural background. Since little is known about the views of black women who choose to breastfeed, sharing your thoughts, feelings and experience will help healthcare providers better understand your needs and ultimately serve women like you better. About 200 women who deliver their babies at Brigham and Women's Hospital will take part in this research study.

## How long will I take part in this research study?

It will take approximately three hours over a six-month period to complete the study. It will begin now while you are in the hospital, and you will receive up to 5 phone calls at home after you are discharged, depending on how long you continue to breastfeed your baby.

Subject Population: Women of African descent

IRB Protocol No.: 2005p002491

Sponsor Protocol No.: N/A

Consent Form Valid Date: 01/11/2006

IRB Amendment No.: N/A

Sponsor Amendment No.: N/A

IRB Expiration Date: 01/10/2007

IRB Amendment Approval Date: N/A

# Partners HealthCare System Research Consent Form

Subject Identification

Template Version Date: June 2005

## What will happen in this research study?

**In your first week postpartum:** You will be asked to answer questions by completing three questionnaires—one about yourself, one about your thoughts and feelings about your breastfeeding experience, and one about the support you may receive for breastfeeding. You may complete these while you are in the hospital, or during the first week after your baby is born, and the time required is about 30-45 minutes. While we hope that you will answer all the questions, you can skip any questions you don't want to answer.

**4-6 weeks after discharge:** Once you are discharged from the hospital, you will receive a phone call about 4-6 weeks after your baby's birth, and you will be asked to answer many of the same questions again. You will also be asked to describe your baby's current feeding pattern (breastfeeding, formula feeding, or some combination of both). You will receive the questionnaires in the mail prior to the phone call so you can read along with the questions asked over the phone. The phone call will take about 30 minutes.

**Monthly follow-up:** Each month after that phone call, if you are breastfeeding, you will receive a brief phone call (5-10 minutes) and be asked to describe your current infant feeding pattern and any reasons your feeding pattern may have changed since the last phone call. These follow-up phone calls will continue monthly for 6 months, or until you are no longer breastfeeding at all.

## What are the risks and possible discomforts from being in this research study?

There are no known risks to taking part in this study, unless answering questions about your experience of breastfeeding is uncomfortable for you. As the mother of a new baby, you may experience fatigue from the time it takes to answer the questions, or be busy with the baby when you receive a phone call. You may request to take a break, or to choose to answer the questions at another time that is most convenient for you.

## What are the possible benefits from being in this research study?

You will not benefit from taking part in this study, although describing your experiences may help you to learn or gain insight about yourself. The information you provide may help health care providers to understand better how black women (women of African descent) think about the best way to feed their babies, and what, if anything, is unique about that.

**Subject Population:** Women of African descent

**IRB Protocol No.:** 2005p002491

**Sponsor Protocol No.:** N/A

**Consent Form Valid Date:** 01/11/2006

**IRB Amendment No.:** N/A

**Sponsor Amendment No.:** N/A

**IRB Expiration Date:** 01/10/2007

**IRB Amendment Approval Date:** N/A

**Partners HealthCare System  
Research Consent Form**

Subject Identification

Template Version Date: June 2005

**Can I still get medical care within Partners if I don't take part in this research study, or if I stop taking part?**

Yes. Your decision won't change the medical care you get within Partners now or in the future. There will be no penalty, and you won't lose any benefits you receive now or have a right to receive.

Taking part in this research study is up to you. You can decide not to take part. If you decide to take part now, you can change your mind and drop out later. We will tell you if we learn new information that could make you change your mind about taking part in this research study.

If you take part in this research study, and want to drop out, you should tell us. We will make sure that you stop the study safely. We will also talk to you about follow-up care.

It is possible that we will have to ask you to drop out before you finish the study. If this happens, we will tell you why. We will also help arrange other care for you, if needed.

**Will I be paid to take part in this research study?**

To thank you for taking part in this study, you will receive a \$10 gift certificate at Toys 'R Us. This will be mailed to you at the address you provide, following the first phone call at 4-6 weeks after the baby's birth.

**What will I have to pay for if I take part in this research study?**

There is no cost to you for participating in the study, other than the time required to answer the questions.

**What happens if I am injured as a result of taking part in this research study?**

We will offer you the care needed to treat any injury that directly results from taking part in this research study. We reserve the right to bill your insurance company or other third parties, if appropriate, for the care you get for the injury. We will try to have these costs paid for, but you may be responsible for some of them.

**Subject Population:** Women of African descent

**IRB Protocol No.:** 2005p002491

**Sponsor Protocol No.:** N/A

**Consent Form Valid Date:** 01/11/2006

**IRB Amendment No.:** N/A

**Sponsor Amendment No.:** N/A

**IRB Expiration Date:** 01/10/2007

**IRB Amendment Approval Date:** N/A

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# Partners HealthCare System Research Consent Form

Subject Identification

Template Version Date: June 2005

Giving you care does not mean that Partners hospitals or researchers are at fault, or that there was any wrongdoing. There are no plans for Partners to pay you or give you other compensation for the injury. However, you are not giving up any of your legal rights by signing this form.

If you think you have been injured or have experienced a medical problem as a result of taking part in this research study, tell the person in charge of this study as soon as possible. The researcher's name and phone number are listed in the next section of this consent form.

## If I have questions or concerns about this research study, who can I call?

You can call us with your questions or concerns. Our telephone numbers are listed below. Ask questions as often as you want.

Deborah McCarter-Spaulding, RNC, MS, IBCLC, PhD candidate at University of Massachusetts Lowell, is the person in charge of this research study. You can call her at [REDACTED]. You can also call Dr. Susan Reece, Professor of Nursing at University of Massachusetts Lowell at [REDACTED] with questions about this research study.

If you have questions about the scheduling of phone calls or study visits, call Deborah McCarter-Spaulding at [REDACTED]

If you want to speak with someone **not** directly involved in this research study, please contact the Partners Human Research Committee office. You can call them at [REDACTED]

You can talk to them about:

- Your rights as a research subject
- Your concerns about the research
- A complaint about the research

Also, if you feel pressured to take part in this research study, or to continue with it, they want to know and can help.

## If I take part in this research study, how will you protect my privacy?

Federal law requires Partners (Partners HealthCare System and its hospitals, health care providers and researchers) to protect the privacy of health information that identifies you. This information is called Protected Health Information. In the rest of this section, we refer to this

simply as "health information."

Subject Population: Women of African descent

IRB Protocol No.: 2005p002491

Sponsor Protocol No.: N/A

Consent Form Valid Date: 01/11/2006

IRB Amendment No.: N/A

Sponsor Amendment No.: N/A

IRB Expiration Date: 01/10/2007

IRB Amendment Approval Date: N/A

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# Partners HealthCare System Research Consent Form

Subject Identification

Template Version Date: June 2005

If you decide to take part in this research study, your health information may be used within Partners and may be shared with others outside of Partners, as explained below.

We have marked with a ☒ how we plan to use and share your health information. If a box is not checked ☐, it means that type of use or sharing is not planned for in this research study.

We will also give you the **Partners Notice for Use and Sharing of Protected Health Information**. The Notice gives more details about how we use and share your health information.

## ▪ Health Information About You That Might be Used or Shared During This Research

- ☒ Information from your hospital or office health records within Partners or elsewhere, that may be reasonably related to the conduct and oversight of the research study. If health information is needed from your doctors or hospitals outside Partners, you will be asked to give permission for these records to be sent to researchers within Partners.
- ☒ New health information from tests, procedures, visits, interviews, or forms filled out as part of this research study

## ▪ Why Health Information About You Might be Used or Shared with Others

The reasons we might use or share your health information are:

- To do the research described above
- To make sure we do the research according to certain standards - standards set by ethics and law, and by quality groups
- For public health and safety - for example, if we learn new health information that could mean harm to you or others, we may need to report this to a public health or a public safety authority
- For treatment, payment, or health care operations

## ▪ People and Groups That May Use or Share Your Health Information

### 1. People or groups within Partners

- ☒ Researchers and the staff involved in this research study

- ☒ The Partners review board that oversees the research

Subject Population: Women of African descent

IRB Protocol No.: 2005p002491

Sponsor Protocol No.: N/A

Consent Form Valid Date: 01/11/2006

IRB Amendment No.: N/A

Sponsor Amendment No.: N/A

IRB Expiration Date: 01/10/2007

IRB Amendment Approval Date: N/A

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- ☒ Staff within Partners who need the information to do their jobs (such as billing, or for overseeing quality of care or research)

## 2. People or groups outside Partners

- ☒ People or groups that we hire to do certain work for us, such as data storage companies, our insurers, or our lawyers
- ☒ Federal and state agencies (such as the U.S. Department of Health and Human Services, the Food and Drug Administration, the National Institutes of Health, and/or the Office for Human Research Protections) and other U.S. or foreign government bodies, if required by law or involved in overseeing the research
- ☒ Organizations that make sure hospital standards are met
- ☒ The sponsor(s) of the research study, and people or groups it hires to help perform this research study
- ☒ Other researchers and medical centers that are part of this research study
- ☒ A group that oversees the data (study information) and safety of this research study
- ☐ Other:

Some people or groups who get your health information might not have to follow the same privacy rules that we follow. We share your health information only when we must, and we ask anyone who receives it from us to protect your privacy. However, once your information is shared outside Partners, we cannot promise that it will remain private.

### ■ Time Period During Which Your Health Information Might be Used or Shared With Others

- Because research is an ongoing process, we cannot give you an exact date when we will either destroy or stop using or sharing your health information.

### ■ Your Privacy Rights

- You have the right **not** to sign this form permitting us to use and share your health information for research. If you don't sign this form, you can't take part in this research study. This is because we need to use the health information of everyone who takes part in this research study.
- You have the right to withdraw your permission for us to use or share your health information for this research study. If you want to withdraw your permission, you must notify the person in charge of this research study in writing.

Subject Population: Women of African descent

IRB Protocol No.: 2005p002491

Sponsor Protocol No.: N/A

Consent Form Valid Date: 01/11/2006

IRB Amendment No.: N/A

Sponsor Amendment No.: N/A

IRB Expiration Date: 01/10/2007

IRB Amendment Approval Date: N/A

**Partners HealthCare System  
Research Consent Form**

Subject Identification

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If you withdraw your permission, we will not be able to take back information that has already been used or shared with others. This includes information used or shared to carry out the research study or to be sure the research is safe and of high quality.

If you withdraw your permission, you cannot continue to take part in this research study.

- You have the right to see and get a copy of your health information that is used or shared for treatment or for payment. To ask for this information, please contact the person in charge of this research study.

▪ **If Research Results Are Published or Used to Teach Others**

The results of this research study may be published in a medical book or journal, or used to teach others. However, your name or other identifying information **will not** be used for these purposes without your specific permission.

**Consent to take part in this research study, and authorization to use or share your health information for research**

**Statement of Subject or Person Giving Consent**

- I have read this consent form.
- This research study has been explained to me, including risks and possible benefits (if any), other options for treatments or procedures, and other important things about the study.
- I have had the opportunity to ask questions.

If you understand the information we have given you, and would like to take part in this research study, and also agree to allow your health information to be used and shared as described above, then please sign below:

**Signature of Subject:**

\_\_\_\_\_  
Subject

\_\_\_\_\_  
Date/Time

**Subject Population:** Women of African descent

**IRB Protocol No.:** 2005p002491

**Sponsor Protocol No.:** N/A

**Consent Form Valid Date:** 01/11/2006

**IRB Amendment No.:** N/A      **Sponsor Amendment No.:** N/A

**IRB Expiration Date:** 01/10/2007

**IRB Amendment Approval Date:** N/A

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**Partners HealthCare System  
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**OR**

If you understand the information we have given you, and would like to give your permission for the person you are authorized to represent to take part in this research study, and also agree to allow his/her health information to be used and shared as described above, then please sign below:

**Signature of Parent(s)/Guardian or Authorized Representative:**

\_\_\_\_\_  
Parent(s)/Guardian of Minor

\_\_\_\_\_  
Date/Time

**OR**

\_\_\_\_\_  
Court-appointed Guardian or Health Care Proxy

\_\_\_\_\_  
Date/Time

**OR**

\_\_\_\_\_  
Family Member/Next-of-Kin

\_\_\_\_\_  
Date/Time

Relationship to Subject: \_\_\_\_\_

**Signature of a Witness (when required by the PHRC or by the Sponsor):**

\_\_\_\_\_  
Witness (when required)

\_\_\_\_\_  
Date/Time

**Statement of Study Doctor or Person Obtaining Consent**

Subject Population: Women of African descent

IRB Protocol No.: 2005p002491

Sponsor Protocol No.: N/A

Consent Form Valid Date: 01/11/2006

IRB Amendment No.: N/A

Sponsor Amendment No.: N/A

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# Partners HealthCare System Research Consent Form

Subject Identification

Template Version Date: June 2005

- I have explained the research to the study subject, and
- I have answered all questions about this research study to the best of my ability.

Study Doctor or Person Obtaining Consent

Date/Time

In certain situations, the Partners Human Research Committee (PHRC) will require that a subject advocate also be involved in the consent process. The subject advocate is a person who looks out for the interests of the study subject. This person is not directly involved in carrying out the research. By signing below, the subject advocate represents (or "says") that the subject has given meaningful consent to take part in the research study.

## Statement of Subject Advocate Witnessing the Consent Process

- I represent that the subject, parent(s), or legally authorized individual signing above has given meaningful consent.

Subject Advocate

(if required by the PHRC or sponsor for this study)

Date/Time

Consent Form Version Date: 12/8/2005

Subject Population: Women of African descent

IRB Protocol No.: 2005p002491

Sponsor Protocol No.: N/A

Consent Form Valid Date: 01/11/2006

IRB Amendment No.: N/A

Sponsor Amendment No.: N/A

IRB Expiration Date: 01/10/2007

IRB Amendment Approval Date: N/A

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## Appendix E

### Contact Information Form

Participant number \_\_\_\_\_

The following information will be separated from your answers and kept in a secure place. Your answers are confidential.

Please provide information about how I can contact you after you go home from the hospital. I plan to mail you information in about 1 month, and also contact you by phone. *I will send your Toys R Us gift certificate to this address as well, as a thank you for your participation.*

Name \_\_\_\_\_

Mailing address: Number and Street \_\_\_\_\_ Apt. # \_\_\_\_\_

City/town \_\_\_\_\_ State \_\_\_\_\_

Zip code \_\_\_\_\_

Home phone \_\_\_\_\_ Cell phone \_\_\_\_\_

OK to leave message? Yes, leave a message ☐ No, don't leave a message ☐

An alternate number where you can be contacted if I can't reach you at the above numbers (optional) \_\_\_\_\_ OK to leave message? Yes ☐ No ☐

Please give the names and phone numbers of people who will always know where to reach you:

1. Name \_\_\_\_\_ Phone number \_\_\_\_\_

OK to leave message with above person? yes ☐ no ☐

2. Name \_\_\_\_\_ Phone number \_\_\_\_\_

OK to leave message with above person? yes ☐ no ☐

Researcher initials \_\_\_\_\_

Date \_\_\_\_\_

## Appendix F

### Follow-up Interview Questions

Subject number \_\_\_\_\_

Date of phone call \_\_\_\_\_

Age of infant \_\_\_\_\_

***Feeding pattern questions:***

How many times did you breastfeed the baby in the last 24 hours? \_\_\_\_\_

Do you use other feedings? Yes/no (*circle*)

If yes, how many of the feedings were bottle feedings? \_\_\_\_\_

-What was in the bottle? (formula, or expressed breast milk)

#formula bottles \_\_\_\_\_

# expressed breast milk bottles \_\_\_\_\_

How many of the feedings were something other than breast milk or formula? \_\_\_\_\_

-What was it? \_\_\_\_\_

Have you had any contact with the lactation consultant (by phone or visit)? yes/no

What topics or problems did you address/discuss? \_\_\_\_\_

\_\_\_\_\_

---

***If the baby is no longer breastfeeding at all:***

When did you stop breastfeeding (approximate date, or how many weeks ago)?

\_\_\_\_\_

Please describe for me the reason you stopped breastfeeding. \_\_\_\_\_

\_\_\_\_\_

---

***Updates:***

Have there been any changes in the baby's health since we last spoke? (If yes, please describe) \_\_\_\_\_

How many visits has the baby had to the pediatrician or pediatric nurse since we last spoke? \_\_\_\_\_

What was the purpose of these visits (for example, well child visits or sick visits)? \_\_\_\_\_

\_\_\_\_\_

Have there been any changes in your health? (If yes, please describe) \_\_\_\_\_

\_\_\_\_\_

Have there been any major changes in your life? (For example, moving, changes in household members or partner) \_\_\_\_\_

Have there been any changes in your employment since we last spoke? (For example, returned to work, changed jobs, quit job)

\_\_\_\_\_

*If the baby is still breastfeeding:*  
**Contact information update**

What is the best phone number(s) to use to reach you next month when I call?

### Biographical Sketch of the Author



## Biographical Sketch of Author

Name	Deborah McCarter-Spaulding
Education	B.S., Simmons College, 1979 M.S., Boston College, 2005 Ph.D., Nursing, University of Massachusetts Lowell, 2007
Faculty and Research Positions	Clinical Instructor, William F. Connell School of Nursing at Boston College, 2000 – present.  Research Nurse, CARE project at William F. Connell School of Nursing at Boston College, 2003 to present.  Research Assistant, PHASE project at University of Massachusetts Lowell, 2004-2005.
Clinical Positions	Staff Nurse, Postpartum Unit, Women and Infant's Hospital, Providence, RI, 2002-2006.  Women's Health Nurse Practitioner, Harvard Vanguard Medical Associates, Wellesley, MA, 1995-1998.  Clinical Nurse III-IV, Postpartum & Antepartum Units, Normal Newborn Nursery, Beth Israel Hospital, Boston, MA, 1986-1994.  Staff Nurse, Postpartum Unit, St. Margaret's Hospital for Women, Dorchester, MA, 1985-1986.  Campus and Professional Staff Member, Nurses Christian Fellowship, New England Region, 1981-1985.  Clinical Nurse II, General Medical Unit, Beth Israel Hospital, Boston, MA, 1979-1981.
Publications	McCarter-Spaulding, D. E. & Horowitz, J.A. (2007). How does postpartum depression affect breastfeeding? <i>MCN The American Journal of Maternal Child Nursing</i> , 32(1), 10-17.  McCarter-Spaulding, D.E. (2005). Using medications in pregnancy and lactation. <i>MCN The American Journal of Maternal Child Nursing</i> , 30(1), 10-17.

McCarter-Spaulding, D. (2004). The importance of breastfeeding in improving the health of African-Americans: A health policy perspective. *The Journal of Multicultural Nursing and Health*, 10(3), 24-27.

Harner, H. & McCarter-Spaulding, D.E. (2004). Teenage mothers and breastfeeding: Does paternal age make a difference? *Journal of Human Lactation*, 20(4), 404-408.

McCarter-Spaulding, D.E. (2002). Parvovirus B19 in pregnancy. *JOGNN*, 31(1), 107-112.

McCarter-Spaulding, D.E. (2001). Varicella in pregnancy. *JOGNN*, 30(6), 667-673.

McCarter-Spaulding, D.E., & Kearney, M.H. (2001). Parenting self-efficacy and perception of insufficient breast milk. *JOGNN*, 30(5), 515-522.

McCarter, D.E. (1978). Comforted to comfort others. The Nurse's Lamp.

Recent Presentations      "Breastfeeding and Postpartum Depression", April 8, 2005.  
Eastern Nursing Research Association Annual Scientific  
Sessions, New York, NY.

"Breastfeeding Self-Efficacy in African-American Women",  
poster presentation, August 14, 2004. Women of Color: Taking  
Action for a Healthier Life, 2004 Minority Women's Health  
Summit, Washington, D.C. , sponsored by U.S. Department of  
Health and Human Services, Office of Women's Health.

Factors Associated with Successful Breastfeeding", April 27,  
2004, April 29, 2003, March 20, 2001, April 4, 2000, April 13,  
1999, April 14, 1998 and February 25, 1997, NU552 Advanced  
Theory II course, Boston College School of Nursing, Chestnut  
Hill, MA.

Certifications              Certified as a Women's Health Nurse Practitioner by The  
National Certification Corporation for the Obstetric, Gynecologic  
and Neonatal Nursing Specialties, 1995. Recertified 1998, 2001,  
2006.

Certified in Newborn Resuscitation by the American Academy of  
Pediatrics/American Heart Association Neonatal Resuscitation  
Program, 2002. Recertified 2006.

Certified as a lactation consultant by the International Board of Lactation Consultant Examiners, Inc., 1989. Recertified 1999, 2004.

Certified as a childbirth educator by The Council of Childbirth Education Specialists, 1987.