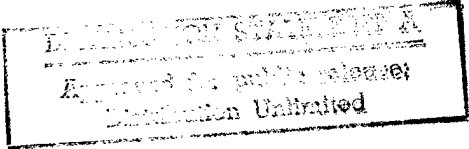


REPORT DOCUMENTATION PAGE			Form Approved OMB No. 0704-0188	
Public reporting burden for this collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302, and to the Office of Management and Budget, Paperwork Reduction Project (0704-0188), Washington, DC 20503.				
1. AGENCY USE ONLY (Leave blank)		2. REPORT DATE 21 May 98		3. REPORT TYPE AND DATES COVERED
4. TITLE AND SUBTITLE INCIDENT AND DURATION OF BREASTFEEDING IN ACTIVE DUTY MILITARY WOMEN			5. FUNDING NUMBERS	
6. AUTHOR(S) Carrie Lorene Dunne				
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) The University of Texas Graduate School of Biomedical Sciences			8. PERFORMING ORGANIZATION REPORT NUMBER 98-018	
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES) THE DEPARTMENT OF THE AIR FORCE AFIT/CIA, BLDG 125 2950 P STREET WPAFB OH 45433			10. SPONSORING/MONITORING AGENCY REPORT NUMBER	
11. SUPPLEMENTARY NOTES				
12a. DISTRIBUTION AVAILABILITY STATEMENT Unlimited distribution In Accordance With AFI 35-205/AFIT Sup 1			12b. DISTRIBUTION CODE	
13. ABSTRACT (Maximum 200 words)  Approved for public release; Distribution Unlimited 19980527 032				
14. SUBJECT TERMS			15. NUMBER OF PAGES 63	
			16. PRICE CODE	
17. SECURITY CLASSIFICATION OF REPORT	18. SECURITY CLASSIFICATION OF THIS PAGE	19. SECURITY CLASSIFICATION OF ABSTRACT	20. LIMITATION OF ABSTRACT	

INCIDENCE AND DURATION OF BREASTFEEDING IN ACTIVE DUTY MILITARY
WOMEN

A
Thesis

Presented to the Faculty of
The University of Texas Graduate School of Biomedical Sciences
at San Antonio
in Partial Fulfillment
of the Requirements
for the Degree of
Master of Science in Nursing

By
Carrie Lorene Dunne, BSN

San Antonio, Texas

May 1998

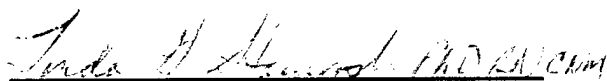
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INCIDENCE AND DURATION OF BREASTFEEDING IN
ACTIVE DUTY WOMEN

Carrie Lorene Dunne

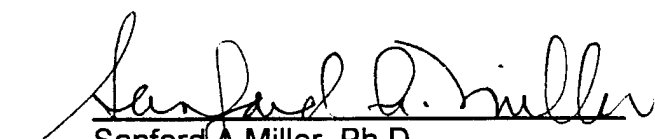
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Dedication

I want to express my sincere thanks to all of those who influenced me in my pursuit of this degree. To my daughter Rebecca, for all the time and attention you unknowingly sacrificed for this degree. To my husband Jim, I give my deepest gratitude for being mother and father to Rebecca and being so patient when I needed you to be. To all of my friends, who were always there with the encouragement I needed to continue this endeavor. To my mom and dad, who provided me with the courage and self-confidence to pursue my dreams through your constant encouragement and support.

Acknowledgements

I would like to express my deepest gratitude to Dr. Gail Williams, thesis chair, for her support and guidance, which helped make my thesis a valuable learning experience. I wish to offer my special thanks to Dr. Linda Staurovsky, thesis committee, for her assistance and expertise in my pursuit of this degree. To my husband, Jim, thank you for all of your computer expertise and continuing support of all of my endeavors.

In addition to my thesis committee members, I would like to recognize Bruce Paper for his assistance with data analysis and statistical knowledge. Appreciation is also extended to the records department at Wilford Hall Medical Center who supported my data collection efforts. Finally, I will always be grateful to the United States Air Force for their sponsorship to make this degree a reality.

INCIDENCE AND DURATION OF BREASTFEEDING IN ACTIVE DUTY
MILITARY WOMEN

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Supervising Professor: Gail B. Williams, Ph.D, R.N.

This study examined the incidence and duration of breastfeeding in active duty women in the armed forces. A convenience sample chart review of 220 active duty women was chosen. These were women who delivered at a southwestern military medical center between January 1997 through June 1997. Women with multiple gestation, premature deliveries (less than 37 weeks)

and maternal/infant complications were excluded from the study. After applying the exclusion criteria, and subtracting the inpatient records not available, and the women who chose bottle-feeding prior to delivery the sample size was 99 women. Data was collected from existing records. The mother's inpatient delivery record provided the demographic data, delivery type, complications and the type of feeding chosen. The type of feeding at discharge was verified by examining the newborn inpatient record. The infant's outpatient record was examined to collect the feeding type at 2, 8, 16, and 24 weeks.

Frequencies were calculated to summarize the demographic and breastfeeding data. It was shown that 85.6% ($n=85$) of the women were breastfeeding at discharge. A logistic regression was used to examine the predictors of breastfeeding, such as age, parity, ethnicity, education, rank, delivery type and marital status. The final sample size to evaluate the incidence of breastfeeding was 85, because 14 additional women chose bottle-feeding prior to discharge from the hospital. Of those 85 women, 57 infant outpatient records were lost to follow-up. So to evaluate the duration of breastfeeding at the specified periods of time, there were 28 records examined. However of the 28 records examined, 19 women continued breastfeeding at 2 weeks, 10 women at 8 weeks, 6 women remained breastfeeding at 16 and 24 weeks.

The logistic regression performed on the incidence data and demographics revealed marital status as the one variable of statistical significance with a p value of 0.04. The women who were married breastfeed more frequently than those women who were not married. In conclusion, the study provides the incidence of breastfeeding in active duty women and an evaluation of the types of women in the armed forces. Further research needs to be conducted to evaluate the duration of breastfeeding in active duty women to more fully understand if there are services or support that can be provided to help these employed women continue breastfeeding.

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Chapter1

Introduction

The increasing number of women in the military can support the importance of investigating incidence and duration of breastfeeding in military women and the professional recommendation related to breastfeeding as the method of choice for infant feeding. In 1978 the American Academy of Pediatrics, "recommended that, optimally, breastmilk should be the sole source of infant nutrition for the first 6 months of life" (Piper, 1996, p.7). Their position has remained unchanged and other organizations such as the National Association of Pediatric Nurse Associates and Practitioners, the American College of Obstetricians and Gynecologists, the American Academy of Family Physicians, and the American Public Health Association have issued similar statements of support (American Academy of Pediatrics & American College of Obstetricians and Gynecologists, 1992; Haaga, 1986; Freed, 1993,).

Due to significant health benefits of breastfeeding, the U.S. Department of Health and Human Services and Public Health Service set goals for breastfeeding in Healthy People 2000. The goals are to increase the number of mothers who breastfeed their babies to 75% in the early postpartum period and increase the number of mothers who nurse for up to six months to fifty percent (1992). This goal was designed for the nation, without reference to any subgroup. The report also states, "successful breast-feeding will require public and professional education and improved support from health care providers." (U.S. Department of Health and Human Services, 1992, p.71).

Ross Laboratories Mothers' Survey (RLMS) is the most commonly cited report used for nationwide breastfeeding statistics. In 1995, RLMS documented 59.7% (n=429,840) of the 720,000 women sampled were breastfeeding in the hospital (Ryan, 1997). At 6 months postpartum, 21.6% (n=155,520) of the women were breastfeeding. The percentage included

employed women and full-time homemakers. The statistics are based on a sample of 720,000 women's responses to a postpartum questionnaire sent to mothers. Comparing rates of breastfeeding in 1989 to the rates in 1995, breast-feeding initiation increased by 14% (from 52.2% to 59.7%). At 6 months, there was a 19.3% increase in the amount of women breastfeeding (from 18.1% to 21.6%).

Women have become an increasingly important part of the labor market. As of 1995, according to the U.S. Department of Labor, 46% of the total labor force is women (1996). Fifty percent of women who are employed have children under one year of age (Hedstrom, 1991). Women with children under the age of 18 compose 66.6% of the labor force and women with children under the age of 3 compromise 54.5% of the labor force, according to the Bureau of Labor Statistics (cited in Surgeon General's Workshop, 1991). The U.S. Department of Labor projects by the year 2005 greater than 48% of workers will be women, the majority of them childbearing age (1996). Therefore, policies and standards affecting working mothers are of interest to health professionals.

U.S. companies vary in maternal leave policies. Most companies provide 6-8 weeks of leave, with some offering the mother to extend with a week or two of vacation time. (Hedstrom, 1991). Therefore, the majority of mothers return to the workforce within 3 months of their baby being born. This may have a great influence on mothers' duration of breastfeeding their children for six months, as encouraged by the Surgeon General (1991).

The military is a subgroup of employed working women in the United States. As of December 31, 1996, the Air Force Military Personnel Center (AFMPC) web page states that 16.71% of its personnel are women. In 1975, 5.4% (33,000) of the force were women and now it has grown to

64,111 females who are active duty. The average age of an officer is 35 years old and enlisted is 29 years old. Of the total force, 33.14% are below the age of 26 years old. The numbers indicate the population of women in the Air Force continues to grow by almost doubling in 11 years.

From the average age of the women, it is noted they are mostly of childbearing age.

The Air Force policy on maternity leave consists of 6 weeks paid time-off. There is the option of extending by 2 weeks if the mother has leave and receives her commander's approval. Women do have the option for discharge from the military due to pregnancy, if they meet the selection criteria and receive commander's approval.

Significance

Breastfeeding needs to be promoted in military women in light of the continued research expanding its benefits. The research findings support that breastfeeding decreases the incidence of insulin-dependent diabetes mellitus, childhood cancer, hemophilus influenza type B meningitis, chronic gastrointestinal disease, upper respiratory infections and otitis media (Page-Goertz, 1989; Lawrence, 1994; Gabbe, Niebyl, Simpson, 1991). Because of the advantages of human milk in illness and disease prevention, the medical profession is trying to encourage their clients to initiate breastfeeding and continue doing so until the child is at least 6 months old (Page-Goertz, 1989).

The advantages of breastfeeding for the mother include: protection from postpartum hemorrhage, natural involution of the uterus, decreased incidence of breast cancer, and increased bonding with the baby (Lawrence, 1994; Gabbe, Niebyl, Simpson, 1991). Furthermore, breastfeeding saves money, time and energy compared to bottle feeding (Spisak & Gross, 1991).

The focus of health care is prevention of diseases and illnesses rather than strictly intervention for diseases. With the stated benefits of breastfeeding, healthcare costs for children who were

breast-fed may decrease. This would also include the parents lost time and wages from work.

The employer of the parent benefits by decreased loss of productivity and decreased cost of health insurance (Freed, 1993). These are positive factors for society and our health care system.

The ongoing research about the health benefits of breastfeeding continues. As health professionals, it is important to focus on interventions to improve the incidence and duration of breastfeeding for the health of the clients. Are nurses, doctors, dieticians, public health personnel, successful in getting women to initiate breastfeeding and providing support to increase duration to 6 months? One study by Sandercock (1993) on the incidence and duration of breastfeeding in military women is not enough to make a determination if the current system is providing information to mothers to encourage initiation and continuance of breastfeeding. It is important to expand the study sample size to understand if what is currently being done by military health professionals is sufficient to meet the U.S. Surgeons General's goal for breastfeeding or does there need to be more education and support provided.

Purpose of the Study

Military women are a unique population due to being on call 24 hours a day, the possibility of being mobilized, and many women working traditionally male jobs (for example, flying aircraft, working in field conditions or the firing range). One thesis study done in 1993 by Sandercock, evaluated the incidence and duration of breastfeeding of 20 military mothers. The findings indicated that 1 mother out of 20 was breastfeeding at 8 weeks postpartum and this woman discontinued between 16 and 24 weeks postpartum. The purpose of this retrospective, replication study was:

1. To examine the incidence and duration of breastfeeding in a larger number of active duty women in the armed forces.
2. To examine the impact of demographic variables on breastfeeding including: age, educational level, ethnicity, number of children, marital status, type of delivery, and military rank.

Research Questions

The research questions for the investigation were:

1. How many active duty military mothers breastfeed during the early postpartum period?
2. What proportion of military mothers continue to breastfeed at each specified time period until 6 months of age?
3. What are the effects of age, parity, education, occupation, delivery type and rank on the incidence and duration of breastfeeding?

Operational Definitions of Variables

Breastfeeding definitions have varied from study to study. For example, any child put to breast during 18 months was considered breast-fed in Chen's study of over 1,000 Shanghai infants. The United Nations Children's Fund formed a group called Interagency Group for the Action on Breastfeeding (IGAB) to develop a formal definition of breastfeeding. Adoption of a formal definition would serve to decrease confusion and improve comparability across research studies (Armstrong, 1991; Burgin, 1996).

The suggested terms from the IGAB are full, partial and token breastfeeding. Full breastfeeding is subdivided into exclusive and almost exclusive. Exclusively breastfed means the infant receives only breastmilk, no water, drinks, or foods. Almost exclusively breastfed means the infant may receive vitamins, minerals, water, juice, or ritualistic feeds. If supplements are

regular, the baby is placed in the partially breastfed category. The token category is reserved for minimal, occasional, or irregular breastfeeding infants.

To date there are no universal definitions of breastfeeding. For the purpose of this investigation, the following operational definitions were used:

Exclusively breastfed – infant's fed at the breast and included infants fed with a bottle of expressed breastmilk.

Partial breastfeeding - included breastfeeding with some amount of formula supplementation.

Formula feeding – meant that the mother was not breastfeeding at all. The infant was not put to breast or did not receive breast milk.

Active duty military mothers - were those women, officers and enlisted, who chose to continue on active service in the armed forces after the birth of their child. Active duty service was full-time employment, meaning forty hours a week or greater.

Early postpartum - was the time of birth up to discharge from the hospital (average 2-4 days).

Incidence of breastfeeding – was the number of women breastfeeding at discharge from the hospital. Method of feeding was documented in the infant's chart at discharge.

Duration of breastfeeding – was measured in weeks. The data was collected from the infant's outpatient record for each routine well baby visit. The standard well baby schedule for Wilford Hall Medical Center was 2 weeks, 2 months, 4 months, and 6 months.

Cessation of breastfeeding – was when the infant was no longer receiving any form of breastmilk and no longer was being put to the breast.

Assumptions

1. Breastfeeding was a learned behavior for the infant and mother. While the breasts provide the physical means and the process is a natural physiological process, one's ability to perform the function was not a natural phenomenon.
2. Being on active duty in the armed services possesses unique expectations. Included in those expectations were the requirements: being on call 24 hours a day, expected to work overtime if needed, working in field conditions, flying aircraft, or mobilized to a foreign country when called. Active duty females have different set of employment stressors than non-military nursing mothers.
3. Inpatient and outpatient records were accurate and clearly reflect the feeding patterns of the infant. Records were available for review in the records department.
4. Employment has been shown to negatively affect breastfeeding duration in working women (Auerbach & Guss, 1984; Kurinij, Shiono, Ezrine, Rhoads, 1989; Kearney, & Cronenwett 1991).

Limitations

1. The study was based on a convenience sample, which was not representative of the total population of military mothers. This limited the generalizability of the results and threatened external validity. The smaller the samples size, the greater the effect on the results.
2. The retrospective design led to a possibility of records not being obtained. This occurred when parents chose to keep the child's records at home, or they were transferred to another duty assignment. Some parents chose to have their child seen by a civilian pediatrician. The records ended up lost or the parents did not bring their child in for each well-baby check-up appointment. Each record may not have included the specific information needed for the study.

3. The study does not have a control group, so factors such as environment and support will remain as potential factors affecting breastfeeding.
4. Women in the study were not polled to ascertain if they had intentions of combining breastfeeding and employment. Some of the mothers may have intended to breastfeed for the length of their maternity leave and no longer.

Summary

The numbers of working women continue to grow (Hedstrom, 1991; Kutscher, 1987, US Bureau of Labor Statistics, 1996). The benefits of breastfeeding are documented but additional benefits are still being discovered (Page-Goertz, 1989; Lawrence, 1994; Gabbe, Niebyl, Simpson, 1991). As health professionals, it is important to examine the effects of employment on breastfeeding to provide guidance and support to working mothers. Studies have shown maternal employment negatively impacts breastfeeding. Research has documented mothers who work while breastfeeding experience a shorter duration of breastfeeding than mothers who do not work (Ryan & Martinez, 1989; Kurinij, Shiono, Ezrine, & Rhoads, 1989; Lawrence, 1994). Military women often have different employment stressors compared to non-military nursing mothers. The incidence and duration of breastfeeding in military women, as compared to the civilian statistics, is important to discern if there is more of a discontinuance rate among this subgroup of women.

Chapter 2

Theoretical Framework

Jeanne Spurlock (1995) examined multiple roles of women and role strains. Spurlock states, "Women are likely to experience multiple roles, often several at the same time, for which different sets of responsibilities are designated. Expectations that others have of us in any one of our roles may differ from our own, and conflict with our goals as individuals. The multiplicity and overlapping of roles often provoke conflict and stress. Depending on a number of variables, growth of the individual is either impeded or promoted (p. 501).

When a woman is employed full-time and then becomes a mother, the added role can affect what decisions and actions she chooses in her life related to work and her family.

The theoretical framework used for this study is based on the Role Theory developed primarily by R. Merton (Hardy & Conway, 1988). Role theory represents a collection of concepts that foretell how actors will perform in a role, or in different circumstances a certain type of behavior can be expected. "According to this theory, society and its institutions are a framework within which individuals play out their roles" (Rheiner, 1982, p.20). Each position is assigned a set of behaviors by the social structure. These behaviors are for the role occupant and all the individuals with whom the occupant interacts within the system. The role expectations, role conception, and role performance define role (Hardy & Conway, 1988).

Rheiner (1982) described role expectations as the habits, which the role set, anticipate from the individual. The role set is the members of an organization or group who have direct significant contact with the individual in his role. They become the role senders to the person

who is playing the role. Role sending is an attempt to influence and bring about conformity in the focal person to meet the expectations of the organization. These acts are called role pressures.

Role conception (Rheiner, 1982) is an individual's own perception of his role. Personal experiences, culture, and environment mold a person's perceptions of their roles. "Role performance is the intersection between the self-concept of the individual and the role expectations of the social system" (Rheiner, 1982, p.21). When the focal person fails to meet social expectations, there are pressures to conform. These pressures can be withholding rewards, punishing or ostracizing the person. When the role set and focal person conflict, this leads to role stress. Many situations may cause this including role conflict, ambiguity, incongruity and overload.

Role overload (Hardy & Conway, 1988) is when a role occupant experiences difficulty in fulfilling role obligations. The actor is able to perform each individual role obligation competently, but the actor is unable to complete it all in the given time available. Hardy & Conway (1988) noted in the literature that the greater number of roles one has the greater the overload. "As women accumulate additional roles such as wife, mother, and career women, they may acquire too many tasks to perform in the time available" (Hardy & Conway, 1988, p.228). The more roles one has, the less time and energy is available for each role.

The importance of understanding role overload is the potential for physical and mental responses. As stated by Hardy & Conway (1988) the psychological responses identified are anxiety, tension, irritation, resentment, and depression. The physiologic responses include:

1. Abnormal levels of adrenaline, triglycerides, and cholesterol,
2. Abnormal heart rate and ECG abnormalities,

3. Pathologic states of hypertension and coronary heart disease,
4. Headaches, dizziness, shortness of breath, nausea, and fatigue.

There are even responses noted at the social level such as withdrawal from interaction, reduced involvement with colleagues and job dissatisfaction.

In summary, women who have been devoting full time to raising a family are becoming equal wage earners or sometimes the only wage earner within the family. "For these women, life styles must change and so must their ways of meeting the role expectations associated with their traditional positions of mother and wife" (Hardy & Conway, 1988, p.211). According to Hardy and Conway (1988) role overload is a major obstacle to women in a dual-career family. The stress comes from having to choose between the options of coordinating the home and family activities and being goal directed at work. As health care professionals, it is important to realize what will be influencing women in their choice about breastfeeding and how to help them incorporate the role changes of being a new mother.

Review of the Literature

By the year 2005, it is projected that the work force will be made up of 48% women (US Dept. of Labor, 1996). Seventy-seven percent of these women will be of childbearing age, 16-44 years old (US Dept. of Labor, 1996). This growing number of employed women has been the basis for many studies on factors affecting employment and breastfeeding. The problem is breastfeeding often has varying definitions in the literature. In the National Surveys of Family Growth (1991), they define breastfeeding as "ever breast-fed". Therefore, interpretation of breastfeeding statistics and information can be confusing.

The review of this body of literature is reported in the following manner: predictors of breastfeeding, breastfeeding statistics, maternal employment and breastfeeding, incidence and duration of breastfeeding. Incidence and duration of breastfeeding has been examined in health maintenance organizations (Samuels, Margen, Schoen 1985), in low socioeconomic classes (Rassin, Richardson, Baranowski, 1984), and comparison of races (Kurini, Shiono, Rhoads, 1988). Only one study by Sandercock (1993) examined military women's incidence and duration of breastfeeding. Many researchers have reviewed the effects of maternal employment and breastfeeding for initiation, continuation, experiences combining the two, problems women encounter, and socioeconomic factors (Gielen, et.al. 1991, Kearney, Cronewett, 1991, Kurini, et.al. 1989, Hills-Bonczyk, et.al. 1993, Auerbach, 1984, Auerbach, Guss, 1984, Goodine, Fried, 1984 & Quarles, 1994).

Predictors of breastfeeding

Loughlin, Clapp-Channing, Gehlbach, Pollard and McCutchen (1985) conducted a study to identify mothers at risk for early termination of breastfeeding. From a private pediatric practice, they followed 94 infants who were breastfeeding for 2 months to determine the frequency of cessation of breastfeeding and identify the factors related to the decision. The mothers were interviewed at each of the well-baby visits.

The authors reported the following results at 2 weeks, 71 (76%) of the mothers were exclusively breastfeeding, 16 (17%) were supplementing and 7 (7%) had switched to formula. By 4 weeks, the mothers exclusively breastfeeding had decreased to 63% and by 8 weeks 48% were exclusively breastfeeding. Thirty percent (n=28) of the mothers had switched to formula by 8 weeks. In the group supplementing with formula, 38% (n=36) who were receiving supplements

at 2 weeks were fed formula only by 4 weeks, and 60% (n=56) had changed by 8 weeks. Predictors of decreased duration of breastfeeding include comments such as; infant hunger, excessive crying, sore nipples, insufficient milk supply, wants father to participate, and preparation for returning to work. When mothers complained of these problems the researchers identified these mothers for being at risk for early termination of breastfeeding. As a health care provider, it would be important to ask mothers about these problems before discharge so appropriate referrals for assistance can be made.

Hawkins, Nichols, and Tanner (1987) completed a study to evaluate predictors of breastfeeding duration in low-income women. They evaluated 47 women in the Women, Infants, and Children Program (WIC) for the variables affecting cessation of breastfeeding. Results revealed the most frequent reason for termination of breastfeeding was inadequate milk supply and poor infant weight gain. Other problems noted were nipple complications, engorgement, leaking, and breast infection. The profile of mothers whom breastfed the longest were older, married, better educated, fewer pregnancies, and babies with higher birth weights. A limitation of the study was the sample size of this population of women. A larger sample size would increase the generalizability of the results. However, the study is useful in helping health care providers target interventions to assist the mothers with lactation and increasing duration.

The prediction of incidence and duration of breastfeeding in women has been studied by several authors (Wright & Walker, 1983; Verronen, 1982; Bloom, Goldbloom, Robinson, & Stevens, 1982; Houston, Howie, Smart, McArdle & McNeilly, 1983). The studies have all showed similar results: mothers complain of insufficient milk supply, nipple problems, formula convenience, returning to work or school. The characteristics of women who breastfeed were

found consistently to be caucasian, middle to upper class, well educated, married, ages 20-30's, healthy with healthy infants. The studies assist health practitioners in deciding who might need lactation intervention but have not suggested any specific interventions related to incidence and duration of breastfeeding.

Breastfeeding Statistics

Breastfeeding data is most often used from the National Surveys of Family Growth (NSFG) and Ross Laboratories Mothers Surveys (RLMS). These studies document the incidences and long-term trends of breastfeeding practices in the U.S. NSFG is collected by the National Center for Health Statistics in cycles of 2 to 6 years and of the 8,450 women surveyed in 1987, 79% (n=6676) responded. RLMS continues to document trends in breastfeeding. Ross Laboratories mails a questionnaire to mothers when their infants are 6 months of age. RLMS reaches 70% to 82% of the new mothers. Comparison showed both the RLMS and NSFG provide reliable estimates of breastfeeding (Ryan, Pratt, Wysong, Lewandowsik, McNally, & Krieger 1991; Ryan, Rush, Krieger, & Lewandowski, 1991).

RLMS is a more useful tool due to the frequency of the collection of data. Its limitations include that the mother is asked to remember the type of milk fed over the previous 6 months. Employment data does not include the time when the mother returns to work, which could influence the data. RLMS analysis of maternal employment has shown to negatively impact the duration of breastfeeding, but not the incidence (Ryan & Martinez, 1989; Ryan, Wysong, Martinez, & Simon, 1990; Martinez & Simon, 1990). Their data analysis reflects 55% (n=2020) of the 3,672 mothers who breastfed in the early postpartum period, but by 6 months of age only

10% (n=668) of employed mothers were still breastfeeding compared to 24% of unemployed mothers (Ryan & Martinez, 1989).

Ellerbee, Atterbury, and West (1993) reviewed infant feeding patterns at a tertiary-care hospital. It was done with a convenience sample in a retrospective chart review of 2,295 women who had given birth in 1990. The incidence of breastfeeding was 24.7% (n=418) and the incidence of bottle-feeding was 75.3% (n=1,273). The demographic variables strongly associated with the decision to breastfeed were reported to be: ethnicity, maternal age, marital status, primiparity and normal birth weight of the infant. "The characteristics of breastfeeding mothers in a population can be used to predict those women who are less likely to breastfeed" (Ellerbee et.al., 1993, p.53). According to these authors, the target groups for interventions include black women of all ages, younger white women, unmarried women, multiparity and women with low-birth weight and premature infants.

Limitations of this study included the retrospective study design that was dependent on documentation found in the medical record. In addition, the records of 653 bottle-feeding women were not analyzed, which could have influenced the data. Data from neonatal deaths should have been excluded from the analysis. The importance of the study, however, is the actual low percentage of women, 24.7% (n=418) who initiated breastfeeding at this hospital (Ellerbee, et al., 1993).

Maternal Employment and Breastfeeding

Kurini, Shiono, & Rhoads (1988) studied the influence of sociodemographic factors on the incidence and duration of breastfeeding. They evaluated 511 white primiparous and 668 black women in the Washington D.C. area. Breastfeeding rates for the white women were 84% and

49% among black women. Breastfeeding duration for white versus black women was 90% versus 74% at 1 month, 72% versus 44% at 4 months, and 50% versus 26% at 7 months postpartum.

The women in this study were interviewed prior to discharge from the hospital for age, education, net family income, marital status, prenatal care, childbirth class attendance and infant feeding choice. Follow-up interviews were done in the homes of the women at 1, 3, and 7 months postpartum. They were able to follow-up with 93% (n=475) of white women and 81% (n=541) black women. Three hundred and seventy-one white women and 560 black women stated they intended to return to work. By 4 months postpartum, 82% (n=304) of white women and 71% (n=398) of black women had returned to work. Employment was divided into professional, technical, sales, clerical, service, student, homemaker, and unemployed.

Logistic regression was used to analyze each group to determine which employment variables affected choice of infant feeding method in the hospital. After adjusting for socioeconomic factors and planned timing of return to work, the only employment variable significantly associated with breastfeeding among black women was a planned return to part-time versus full-time work. No maternal employment factor was significantly related to breast-feeding in the hospital for white women. Cox proportional hazard regression analyses was used to examine the effects of employment on duration of breastfeeding of those women who returned to work. Results indicated that black women and white women who worked in sales or technical fields, and white women who worked in clerical jobs discontinued breastfeeding sooner than women in professional jobs. A trend toward shorter duration of breastfeeding in women who worked full-time versus part-time was noted. Life table analysis showed women in professional occupations had the longest duration of breastfeeding. Half of them, 100 women, were still breastfeeding at

38 weeks postpartum. To summarize, "the effect of maternal occupation on duration of breastfeeding was, for the most part, similar in both ethnic groups"(Kurini, et al., 1988, p.1248).

Gielen, Faden, O'Campo, Brown and Paige (1991) did a study on maternal employment during the early postpartum period. The authors were looking specifically at the effects of initiation and continuation of breastfeeding. The population consisted of white and black females from Baltimore City. The total number of women participating was 1900, 52% of who were black women. The mean age for the women was 25.5 years and the mean years of education were 12.8 years. Data was collected from telephone interviews at 1-3 weeks postpartum and 12 weeks postpartum.

The importance of the employment variables for initiation and continuation of breastfeeding was determined using multiple logistic regression. Interaction between employment variables and sociodemographic variables were tested and none were found. "In the logistic regression model, with initiation of breastfeeding as the outcome, ethnicity, education, feeding intention, and marital status were significant predictors. When the variable, planning to be employed was added, there was no significant effect"(Gielen, et al., 1991, p.301). Initiation of breastfeeding was independent of when the women returned to work.

Using the logistic regression model to predict continued breastfeeding, ethnicity, education, feeding intention, and maternal age were significant predictors. When maternal employment was added to the model, there was a significant effect. After adjustments for demographic variables, unemployed mothers were 3.24 times more likely to be still breastfeeding as compared to employed mothers. Employment outside the home is associated with discontinuing breastfeeding. A limitation of this study was the urban population used which eliminated the lower and upper

socioeconomic classes of women. Of the 710 women who completed the first interview, 324 were planning to be employed within the first 6 months. The proportion employed at 12 weeks was 196 compared to 564 not employed. This constitutes a wide variance, which decreases the sample size (Gielen, et al., 1991).

Goodine and Fried (1984) conducted a prospective study to evaluate infant feeding practices. They looked at pre and postnatal factors affecting the mothers' choice and the duration of breastfeeding. The population was 288 predominantly middle class women, who were interviewed during each trimester of their pregnancy. The information collected included socioeconomic status, family health history, and maternal consumption of alcohol, nicotine, marijuana, and nutrition intake. The postpartum follow-up was done in the hospital, 2 weeks, 4 weeks, 3-6 months, and 6-12 months.

According to the study 80% (n=230) of the mothers made their infant feeding choice prior to pregnancy and 19.5% (n=55) decided during the pregnancy. Of the 237 that had chose to breastfeed, 188 followed through and of the 23 women who chose to bottle-feed, all of them followed through. Twenty-six women chose combination breast and bottle-feeding. When the decision to breastfeed was made pre-pregnancy, the mothers actually breast-fed an average of 9.5 months. Those women, who decided during pregnancy, breast-fed an average of 7.9 months. This result shows a correlation between duration of breastfeeding and when the decision about breastfeeding is made (Goodine & Fried, 1984).

The researchers found no association between feeding method chosen, mother's age, income, parity, ethnic background or sex of the child. Alcohol consumption among the 288 women was .21 ounces at 1 month postpartum and .26 ounces at 6 months postpartum, so the findings do not

support a relationship to method chosen of feeding. Marijuana use showed no relation to method feeding chosen. Cigarette smoking was found to be associated with the type feeding chosen during the postpartum period. Eighty-eight percent (n=195) of the nonsmokers breast fed in the hospital compared to 72.2% (n=26) of the light smokers and 64.7% (11) of the heavy smokers (>16 mg of nicotine a day). The duration of breastfeeding was affected by smoking. Nonsmokers' breast-fed up to 8.9 months and smokers breast fed up to 5.2 months. The study supports that women who make their decision before pregnancy are more likely to continue breastfeeding. The factors that were shown to affect the duration of breastfeeding was smoking in the mother. Alcohol and marijuana did not play a role in a mother's decision to continue breastfeeding. The results of this sample can not be generalized to the US population due to the "predominantly middle class" participants. The sample size was appropriate and the results related information needed by providers to support mothers during breastfeeding (Goodine & Fried, 1984).

Auerbach and Guss (1984) did a survey to evaluate 567 women's experiences with employment and breastfeeding. They evaluated the timing of the return to work and number of hours worked, instead of the type of job, as to when the baby was weaned. The questionnaire was anonymous and the respondents were from 49 states and 5 foreign countries. They received 676 different mother-infant experiences due to the number of children. The modal number of children was one and the mean number was two. The average age of the respondents was 30 years old. Ninety-four percent were white and married. Education years ranged from 10 to 28 years. Fifty-two occupations were represented including factory workers to doctors and lawyers.

Seventy-six percent of the women were back at work by 13 weeks postpartum. Forty-nine percent of the women used expressed milk for missed feedings until solid foods were introduced. Duration ranged from 4 weeks through 5 years and 2 months. The average age of the infant when the mother returned to work was 10 weeks. It was shown that of women who returned to work before the child was 16 weeks, 60% had weaned. Part-time workers reported their infants nursed longer than full-time mothers. The combined effect of maternal return to work and the number of hours worked had an effect on the infant weaning age. Infant weaning age before one year is highest when the mother returns to full-time work before the infant is 16 weeks old (Auerbach & Guss, 1984).

“When the mother returns to work seems to have greater effect than how many hours she works per week.” (Auerbach & Guss, 1984, p.959). Mothers who worked 40 or greater hours, but did not return to work until 16 weeks postpartum or later, were more likely to continue breastfeeding; compared to women who worked 20 hours but returned before 16 weeks.

Auerbach and Guss state, “Respondents who returned to work after their infants were 4 months old or older were less likely than other respondents to feel that employment negatively affected breastfeeding” (p.960). Those women who reported going to work before 16 weeks and whose infants were weaned before 6 months, were twice as likely to perceive that working had a negative impact on breastfeeding. No respondent replied that breastfeeding had negatively impacted their employment. A limitation of the study was that it was limited to women who read 4 different magazines and therefore were self selected volunteers. One magazine was a professional journal, Birth, and the others were women’s magazines that can be purchased anywhere. The sample size was appropriate but did not include many lower socioeconomic

mothers or single parent families. Another problem is how many years ago did the women breastfeed and work? They could have been attempting to recall experiences from many years ago (Auerbach & Guss, 1984).

Auerbach (1984) used the same survey responses to evaluate the problems mothers encounter when they return to work. She had asked what the mothers did when separated from the infants, pump or not, the degree to which employers and others helped or hindered their breastfeeding. Forty-four percent of the women stated their employers did not know they were nursing. Thirty-nine percent of the employers were considered helpful because they allowed one or more breaks per day for pumping. Employers (16%) who were considered to interfere with nursing, reported breastfeeding an impediment to productivity, refused to allow breaks, made derogatory remarks about her breastfeeding, or would not allow the child to be brought to the mother during work. Eighty-four percent reported 30 different obstacles to breastfeeding and working not related to employment status. The reported obstacles were the ones listed to all mothers regardless of employment status. The most common problem stated was fatigue, and that was the most common complaint with all parents with children under 3 years old. The second most common problem was finding time to pump at work, then worry about milk supply. Others problems included are: no time for self, unhappy leaving baby, breast engorgement, pressure from others, leaking milk, getting the baby to use the bottle, getting and keeping a babysitter, and finding a place to pump at work. Sixty-nine percent of the women stated time resolved most of the difficulties because they became proficient at managing them. The respondents made it clear that they were overwhelmed with the multiple demands and expectations placed on them.

Breastfeeding can be done along with working, but mothers need support from family, as well as, employers to be successful. (Auerbach, 1984).

Morse and Bottorff (1988) completed a study to evaluate the process of preparing for the transition from breastfeeding in the home to continuing to breastfeed while employed. Their sample was 61 urban Canadian mothers. The mothers intention to breastfeed and work was compared with actual breastfeeding duration, time returned to work, and the kind of childcare arrangements that were used. The study was conducted with monthly phone calls until the child was weaned from the breast.

The results of the study revealed: 19 women stopped breastfeeding before returning to work, 4 continued for 2 weeks or less after returning to work, and 36 successfully continued to breastfeed while employed. The mother's plans for childcare, the length of time they intended to breastfeed and plans for combining breastfeeding and working changed frequently. Mothers' were uncertain about their abilities to combine breastfeeding and employment. Limitations of the study included the geographic location. Canada has more lenient policies regarding when and how mothers can return to work when compared to the United States. In the United States women often return to work between 6-8 weeks compared to Canada which is often 6 months (Morse & Bottorff, 1988).

Kearney and Cronenwett (1991) did a study with 128 women to evaluate breastfeeding and employment. They looked at the effects on breastfeeding in a homogeneous sample of employed mothers verses stay at home mothers. The population consisted of married couples expecting their first child and planning to breastfeed for at least 6 weeks. The total number of participants was 120 families. The participants were married for an average of 3.4 years and all but 2 were Caucasian. The average age of the mother was 28.8 years old and the average education level

was 16 years. Seventy-five percent (n=96) of the sample planned to return to work for an average of 30 hours per week after giving birth.

Prenatal variables were evaluated in the 3rd trimester by using an adapted version of the Attitudes toward Breastfeeding Scale. Once delivery had occurred there was a structured interview in the home one week postpartum and then by telephone from 2 weeks to 6 months. The mothers were questioned about hours worked outside the home, the way the infant was fed during the mother's absence, and whether the mother experienced any of the problems on the 22 item potential breastfeeding related events. The list contained stated problems as leaking breasts, fatigue, worry about insufficient milk supply, or fussy infant refusing to breastfeed. If these problems occurred the mother was asked to rate the severity. The mother was considered weaning if the infant had not nursed in 48 hours. At 6 months postpartum, all the women completed a questionnaire whether they had weaned or not. The questionnaire used a Likert scale, which evaluated breastfeeding satisfaction and support received during breastfeeding. The participants also completed a 28-item Infant Characteristics Questionnaire, by which they rated their infants as easy to difficult in given situations (Kearney & Cronenwett, 1991).

The researchers found "mothers planning to work worked more hours per week prenatally, had less favorable attitudes toward breastfeeding, and planned to breastfeed for a shorter time than did those not planning to work" (Kearney & Cronenwett, 1991, p.474). Women who earned less than \$20,000 planned to breastfeed longer than those who earned more than \$20,000. When breastfeeding problem scores of employed and non-working mothers were compared, no significant differences were noted. Kearney and Cronenwett stated, "A multivariate survival analysis revealed prenatal intention as the most important predictor of length of breastfeeding;

however, return to work by 2 months postpartum exerted a negative effect on duration of breastfeeding, even when prenatal goals were considered" (p.476). There were no significant differences between working and non-working mothers satisfaction with breastfeeding, support, or perceived fussiness of the infant. Limitations included that few of the women held blue-collar jobs and this type of employment might have exerted a different effect on breastfeeding than this professional group. Another factor to be considered is 50% (n=64) of the sample used bottles in the second week postpartum, so this may have affected breastfeeding outcomes (Kearney & Cronenwett, 1991).

Hills-Bonczyk, Avery, Savik, Potter, and Duckett (1993) developed a study to evaluate 619 women's experiences with combining breastfeeding and employment. Participants were primarily white, primiparous women. Forty-two percent worked in professional jobs, 20.8% in semiprofessional jobs, 22.6% in highly skilled jobs and 14% in semiskilled jobs. Initial visits were conducted within 6-24 hours after delivery and by telephone at 1,3,6,9, and 12 months. A questionnaire, *Combining Breast-Feeding and Working* was mailed to each woman who had returned to work or school more than 5 hours per week. Some women were lost to follow-up but at the 12-month contact, 595 women completed the final telephone survey. Two hundred and eleven women weaned prior to returning to their jobs and 120 women were homemakers. Two hundred and eighty-eight women continued to breastfeed after returning to work. The mean age of the baby at the time the mother returned work was 14.1 weeks. Mothers worked a mean of 4.3 days and 30.9 hours per week.

The comparison results among subgroups showed the women who continued to breastfeed were older than the women who chose to wean prior to returning to work. Those who chose to

combine nursing and work had completed significantly more years of formal education.

Homemakers breast-fed exclusively longer than the employed mothers. Employed mothers breast-fed for a mean of 22.1 weeks. Of the 288 women who combined breastfeeding and employment, 103 continued to provide exclusive breast milk for a mean of 8 weeks after they returned to work. The biggest problems reported by women who were employed were not being able to express enough milk, leaking, maintaining a milk supply, finding a place to pump, and finding a place to store the milk (Hills-Bonczyk, et al., 1993).

Duration was evaluated by dividing the women into 3 groups. The three groups were those who breast-fed 8 weeks or less, 9-26 weeks, and greater than 27 weeks were recorded. Three variables were examined: hours of work per week, weeks postpartum of return to work, and maternal years of education. Results for women in the short and moderate duration category indicated that they worked more hours per week, returned to work sooner, and had less formal education than those who breast-fed for 27 weeks or more. Of the 269 women, 116 reported that there was difficulty with continuing to breastfeed after returning to work, while 127 reported they did not find it difficult. The sample was fairly homogenous due to the limitations noted; the lack of ethnic diversity, and socioeconomic classes and the majority of women had advanced education. While some of the clients were lost during follow-up, the sample size continued to be adequate (Hills-Bonczyk, et al., 1993).

Moore and Jansa (1987) did a survey of policies and practices in support of breastfeeding mothers in the workplace. They surveyed 12 firms with known breastfeeding support programs and mailed a survey to 100 of the most profitable Fortune 500 companies. Twenty-nine percent responded to the survey. All the companies that responded had maternity leave policies including

guaranteed return to the same or similar position. Thirty-two percent of the companies had flextime or part-time policies and less than 5% had job sharing and none had day care available. Fourteen percent of the companies allowed breastfeeding in the workplace, 5% had an electric breast pump and 48% had a refrigerator. A limitation of the study was the number of respondents to the questionnaire. Most likely the only ones who responded were the companies who had some sort of maternity and/or breastfeeding policies. So the results were biased to the companies who responded. The authors "are not optimistic that encouragement to breastfeed across the American work place has increased" (Moore & Jansa, 1987, p.194).

Incidence and Duration

Rassin, Richardson, Baranowski, Nader, Guenther, Bee, and Brown (1984) evaluated the incidence of breast-feeding in low socioeconomic mothers in the United States, focusing on ethnic patterns. Their sample size was 379 women who completed questionnaires about demographics, reproductive history, prenatal care, and education. They found only 27.2% of the population intended to breast-feed. The single most influential variable upon the incidence of breastfeeding was ethnicity. The population consisted of unemployed, young, single women with little education. The population consisted of 145 Anglo-Americans, 131 black Americans, 62 Mexican Americans, and 19 others. The percentage of women who chose breastfeeding, respectively, was 43.5%, 9.2%, 22.6%, and 42.1%. The variable of maternal ethnicity showed the greatest significance to breastfeeding, as compared to the other demographic variables. The hypothesis that decreased breast-feeding incidence occurs in low socioeconomic groups was supported. The study had a good sample size due to a 94% questionnaire return rate. They did not include stillborn infants. They took ethnicity and maternal age into account and found ethnicity affected

breast-feeding incidence dramatically. These results are important when planning interventions in a breast-feeding population.

Janke (1988) completed a study to evaluate breastfeeding duration following cesarean and vaginal births. The researcher questioned 215 women at 6 weeks postpartum to identify differences in infant feeding between women who had delivered vaginally verses a cesarean delivery. The author found no statistically significant differences between women who delivered vaginally verses cesarean. Although more of the cesarean mothers were bottle-feeding at 6 weeks, she found that self-reported commitment to breastfeeding was associated with success and had no relation to delivery type.

Maternal reasons for stopping breastfeeding were similar for both cesarean and vaginal birth women and they usually gave more than one reason. The most commonly cited reasons were returning to work (70.6%), convenience (64.7%), dislike of breastfeeding (38.2%), and medical problems with breasts (38.2%). Reasons to discontinue breastfeeding related to the infant were inadequate milk supply (76.5%); infant refusal to feed (23.5%); and medical problems (8.8%). The sample of women studied were predominantly Caucasian, middle to upper class, well educated, married, and over 25 years old. It was a fairly homogenous sample. The sample size was adequate but the results were not statistically significant. This is one of the few studies done to evaluate if there was a difference between cesarean and vaginal delivery mothers' choice regarding about breastfeeding (Janke, 1988).

Samuels, Margen, and Schoen (1985) evaluated the incidence and duration of breast-feeding in a health maintenance organization population. It was a prospective study conducted at the Kaiser Permanente Medical Center in California. The participants were part of a prepaid comprehensive

health plan. The sample size of 632 women was representative of the population in that area. This was a heterogeneous population, composed of 38% (n=232) blacks, 40% (n=246) whites, 11% (n=69) Asian, and 9% (n=55) Hispanic women. Sixty-two percent (n=390) were between the ages of 21 and 31 years old, and almost half were primiparous. The incidence of breast-feeding was 66% (n=417) for the total number of women. White, married women between 26 and 30 years old decided to breast-feed more often than the others. Fifty-two percent of the blacks breast-fed, 60% of Hispanics, and 67% of Asians chose to breast-feed. Fifty-eight percent (n=242) of the women stopped breastfeeding by 4 months postpartum. The greatest decline was noted in the first 2 weeks. The results of their study showed that ethnicity, age and receipt of formula in the hospital had the most significant impact.

The study sample size was adequate for this study. The study included women who belonged to an HMO and did not include families earning less than \$7,000 a year. So the sample was representative of a lower to middle class group of women. The study showed the increase in the incidence of breast-feeding among all women and then a sharp decline after 2 weeks. Therein lies the need for additional research with interventions targeted to assist different groups of women (Samuels, et al., 1985).

O'Leary Quinn, Koepsell, and Haller (1997) conducted a study to evaluate breastfeeding incidence after early discharge and factors influencing breastfeeding cessation. They used a descriptive two-group survey with a convenience sample of 101 primiparous, breastfeeding women who had a vaginal delivery of a healthy infant. The follow-up phone call was done 6-8 weeks postpartum. The group was divided, 75 mothers were released from the hospital at 24 hours (by choice or insurance) with one home visit on day 3 and 75 mothers were released at 48

hours. They found no significant differences in duration of breastfeeding between the 2 groups. Reasons cited in both groups for discontinuance of breastfeeding were: infant was not getting enough milk 35% (n=11); returning to work or school 19% (n=6); formula is easier to use 19% (n=5).

Limitations of the study included the home visit to the 24-hour stay mothers. The effect of that visit was not studied. The study sample was drawn from a birthing center that served a well-educated, married, white population so the results generalizability is limited. The effects on breastfeeding related to the length of hospital stay is worth further evaluation due to the increased pressure from insurance companies to decrease hospital stays (O'Leary Quinn, et al., 1997).

Sandercock (1993) reviewed 20 mother-infant pairs for breastfeeding at the time of discharge, 2, 8, 16 and 24-week well-baby visits. At the time of discharge, 9 mothers were breastfeeding and 11 were formula feeding. At 2 weeks, 8 mothers were breastfeeding and 12 were formula feeding. At 8 weeks, 1 mother was breastfeeding and 19 were formula feeding. One mother continued breastfeeding at 16 weeks and discontinued by 24 weeks. The researcher noted no significant correlations between type of feeding, age, ethnicity, marital status, number of previous children, type of delivery, socioeconomic status, education or type of job at any of the data collection time points.

The study reported 45% (n=9) of the active duty mothers were breastfeeding at discharge and none were breastfeeding at 6 months, as contrasted with the civilian population. At the time of this study, the civilian population from Ross Laboratories data showed 55% (n=2020) of the 3,672 mothers who breastfed in the early postpartum period, but by 6 months of age only 10% (n=668) of employed mothers were breastfeeding and by 6 months. The significant finding is that

fewer active duty military mothers began breastfeeding and fewer continued to breastfeed.

Limitations of the study included the very small sample size due to participant's records not being available. It was a retrospective study design instead of prospective. It was conducted through a chart review, where it is possible not to have the feeding method documented (Sandercock, 1993).

Conclusions

A number of conclusions have been drawn from the previous review of the literature. Employed women, who are older, married, with advanced education are the subgroup of women who tend to breastfeed longer. Research did not support that employment affected the incidence of breastfeeding but does have a relation to the duration of breastfeeding. Working mothers whether full or part-time had longer duration of breastfeeding if they returned to work after 16 weeks postpartum.

Overall, the literature reviewed helped discern some of the problems working women are facing and coping with while breastfeeding. Unfortunately, the main subgroup that has been studied is the white middle class female. Other studies that include varied ethnic groups, variations in occupational roles, and differing levels of socioeconomic status have little representation in the literature.

The major limitation of Sandercock's (1993) study of the incidence and duration of breastfeeding in the active duty women was the small sample size, which prohibits the ability to generalize about all military women who are breastfeeding. Replication of this study with a larger sample size may improve the ability to make generalizations about breastfeeding military women. From the results, the researcher recommends comparing the findings with civilian national

statistics. That would provide a guideline to see if this subgroup of military women differ from civilian employed women.

The theoretical framework of role theory was chosen because of the additional roles employed mothers are obligated to perform. Multiple roles can lead to conflict in a woman's life. The added role of mother can affect her decisions and actions in regard to her work and family (Spurlock, 1995). To breast-feed or not is a decision all mothers must make for their infant and themselves. The role set (the individuals or groups that affect one's role) provides the pressure to conform to their expectations. As the actor in role, the woman must decide which roles she can perform before role overload occurs. If role overload occurs the woman has less time and energy to devote to all of the roles. Undesirable physical, psychological, and social responses can ensue if role overload continues. At that time a woman will have to choose what roles or parts of roles she can fulfill.

Chapter 3

Design and Methods

Design

A nonexperimental, retrospective descriptive correlational design was used. The Hawthorne effect was eliminated with a retrospective design (Polit & Hungler, 1996). This type of research is used to understand relationships as they naturally occur, without any intervention (Polit & Hungler, 1995). Since it is unethical to require an infant to be formula fed for a research study, this study design was chosen.

Setting

Data collection took place at Wilford Hall Medical Center in San Antonio Texas. There were 220 deliveries of active duty women from January 1997 to June 1997. The women who delivered there were active duty and dependents of active duty and retired military personnel. There was a Level III Neonatal Intensive Care Unit at this facility. There were childbirth and breast-feeding education classes available at no charge for the women. Exempt study status was obtained from the UTHSCSA Institutional Review Board and Wilford Hall Medical Center Institutional Review Board.

Subjects

A convenience chart sample of all active duty women, who met the inclusion criteria, was chosen between January 1, 1997 and July 1, 1997. Clinical records provided a list of active duty women who delivered at this facility. Starting with January 1, 1997, the researcher chronologically enrolled all the active duty deliveries that met the inclusion criteria. Using a specific time frame helped ensure consistency in information and treatment the patient received while in the facility.

An attempt to minimize decreased losses of mother and infant records due to military moves was used by limiting the time frame for data collection.

The charts reviewed were of active duty military women who delivered at this southwestern military facility, and planned to remain on active duty after their child was born. The principle investigator reviewed all charts to see if women met the inclusion criteria. Inclusion criteria included women who delivered vaginally or by cesarean, after 37 weeks gestation. Exclusion criteria included women with multiple gestation, premature deliveries (delivery prior to 37 weeks gestation), infants adopted out after delivery, intrauterine fetal demise and maternal/ infant complications in the early postpartum period. The maternal complications that led to exclusion from the study included, fever of unknown origin, antibiotic therapy or any medication therapy contraindicated in breast-feeding, severe psychiatric disorders, HIV/AIDS, and breast mammoplasty. Infant complications that led to exclusion from the study included, respiratory distress syndrome, any physical abnormalities requiring intravenous or tube feedings. Only the charts of women meeting the inclusion criteria were considered for the study sample. Similar complications occurring after the early postpartum period excluded a mother/infant from the study due to the risk of skewed data.

Ethical Considerations

There were no benefits to the individual subjects, but the study was a basis for increased nursing knowledge about the incidence and duration of breast-feeding in active duty military women. The study design was a retrospective chart review; therefore there were no additional risks to the individuals whose records were reviewed. In addition the study received exempt status from the Institutional Review Boards (IRBs) and did not require informed consent from the

subjects (Appendix A). Confidentiality was maintained because names, register numbers and social security numbers were used by the researcher to coordinate records only. No names, register numbers, or social security numbers appeared in any data presented by the researcher. Only the researcher had access to personal subject information. After coordinating maternal and infant hospital records, a subject number was assigned to each subject's information. Charts were reviewed to see who met the inclusion criteria. Once the subject number was assigned, the researcher destroyed all identifying record numbers. All reporting of the findings were in the aggregate.

Procedures

Data was collected only from existing records. A list of the mother and infant names and hospital numbers were given to the Wilford Hall's inpatient records department to be pulled. Inpatient records personnel notified the investigator when 25-30 records were ready for evaluation. The researcher allowed 4.5 months for the collection of this data. Inpatient records personnel were notified of the data collection time constraints but were unable to comply due to increased workload and preparation for a Joint Commission inspection. The mother's inpatient records provided her age, ethnicity, number of children, educational level, occupation, military rank, marital status, type of delivery, and maternal complications. Data about sociodemographic variables, such as age, ethnicity, and educational level, were collected to estimate any confounding effects. The infant's record was examined for the type of feeding at discharge and any complications in the early postpartum period.

The investigator recorded the infant's social security number and the military base the parent was stationed at; to identify the outpatient records. A list of all the infant's charts required was

compiled by the base location of the records. Each outpatient records section at the four military bases was then given a list of names and numbers. The researcher was notified when the records were available for evaluation. This process took approximately one month. The infant's outpatient record was examined for type of feeding at 2 weeks, 2 months, 4 months, and 6 months. Once data collection was complete the researcher destroyed the record numbers.

Data Analysis

Data was analyzed using descriptive and inferential statistics. The research questions for the investigation were:

1. How many active duty military mothers breastfeed during the early postpartum period?
2. What proportion of military mothers continued to breastfeed at each specified time period until 6 months of age?
3. What were the effects of age, parity, education, occupation, delivery type and rank on the incidence and duration of breastfeeding?

Research questions number 1 and 2 were answered using frequency distribution in conjunction with the sociodemographic data. The central tendency measures of mean and range were reported for demographic variables when appropriate. The level of significance or alpha was set at 0.05. Research question number 3 was answered by means of a logistic regression. "Logistic regression is used in studies in which the dependent variable is categorical" (N.Burns & S.Grove, 1993, 534). It was used to predict the incidence and duration of breastfeeding between the variables of age, ethnicity, education, parity, occupation, rank, marital status and delivery type. Data from the investigation was analyzed using the SPSS PC+ Student Ware software program.

Summary

In this chapter, the design, setting, subjects, confidentiality, and the procedure were discussed. Exclusion criteria were presented with a description of the facility used for data collection. The exact information to be gathered was explained and how confidentiality of the subjects were protected. Procedures and data analyses were defined for this research study.

Chapter 4

Results

Study Design

In this chapter the results of the data analysis are presented. Research question number one, how many mothers breastfed during the early postpartum period, yielded nominal data or descriptive statistics. The second question, what proportion of military mothers continue to breastfeed at each specified time period until 6 months of age, yielded ordinal data or descriptive statistics. The third question, what are the effects of age, parity, education, occupation, delivery type, and rank on the incidence and duration of breastfeeding, was answered by logistic regression. This analysis was used to predict breastfeeding with each of the variables.

The total number of active duty women who delivered between January 1997 and June 1997 was 220 as determined from the delivery book (Table 1). The total number of delivery and newborn inpatient records reviewed was 116 records (52.7%). The inpatient records department was unable to pull all of the records within the specified 4.5 months of data collection. Of the 116 charts reviewed, 10 records were excluded for preterm deliveries (less than 37 weeks gestation) and one record for a maternal medication contraindicated in breastfeeding. Three infant records were excluded due to respiratory distress syndrome, and 3 were excluded for intravenous tube feedings. The total number of records lost to maternal/infant complications was 17 (n=14.6%) out of 116 women. Therefore the total number of cases included for analysis of the research questions was 99.

Table 1. Determination of Sample Size Based on Chart Distribution

<u>Reasons For Record Loss</u>	<u>Available Records</u>		
Potential Records Available	220		Total
Chose Bottle prior to Delivery	25	195	
Records not pulled for Evaluation		79	116
Exclusions for Maternal/Infant Complications		17	*99
Chose Bottle prior to Discharge		14	85

*Total available records (charts meeting all inclusion criteria)

Demographic Data.

The demographic frequencies for the sample of 99 women are displayed in Table 2.

In the total sample of the 99 subjects, 66.7% (n=66) were Caucasian, 17.2% (n=17) were Black, 2% (n=2) were Asian and there were 14.1% (n=14) were classified as others. The age groups of these women were 18-24 years old (33.3%), 25-31 years old (48.5%), 32-40 year old (17.2%), and 1% of the women were over 40 years old. The women ranged in age from 18-42 years with a mean age of 28 years. Fifty-five point six percent (n=55) of the women were first-time mothers and 44.4% (44) had one or more children.

Educationally, 39.4% (n=39) completed high school, 29.3% (n=29) had some college, and 31.3% (n=31) had a college degree. The women ranged in education from 12 to 19 years of school. The women's occupation was evaluated by rank and area of employment. Clerical was defined as any job that held by an enlisted member working in an office setting. Technical was defined as any enlisted personnel working in an area requiring some kind of training such as nurse's aide, truck driver, firing range, dental hygienist, or security police. Professional is viewed as anyone with any college education in the rank of Master Sergeant and above. Military women have an array of occupations despite educational preparation. The clerical occupation had 30.3% (n=30), technical had 31.3% (n=31) and the professional group had 38.4% (n=38). Military rank consisted of 71.7% (n=71) enlisted and 28.3% (n=28) officers. Marital status of the subjects was 86.9% (n=86) were married and 13.1% (n=13) were single. The delivery types were 80.8% (n=80) vaginal and 19.2% (n=19) cesarean.

Table 2. Frequency Distribution of Demographics (N=99)

	Frequency	Percent
Ethnicity		
Caucasian	66	66.7%
Black	17	17.2%
Asian	2	2.0%
Other	14	14.1%
Total	99	100%
Age		
18-24 yrs	33	33.3%
25-31 yrs	48	48.5%
32-40 yrs	17	17.2%
Over 40 yrs	1	1.0%
Total	99	100%
Parity		
Primiparous	55	55.6%
Multiparous	44	44.4%
Total	99	100%
Education		
High School	39	39.4%
Some College (1-3yrs.)	29	29.3%

(Table 2 Continued)

	Frequency	Percent
College Degree	31	31.3%
Total	99	100%
Occupation		
Clerical	30	30.3%
Technical	31	31.3%
Professional	38	38.4%
Total	99	100%
Rank		
Enlisted	71	71.4%
Officer	28	28.3%
Total	99	100%
Marital Status		
Marriage	86	86.9%
Single	13	13.1%
Total	99	100%
Delivery Type		
Vaginal	80	80.8%
Cesarean	19	19%
Total	99	100%

Analysis of Research Questions

Research question number one stated, how many mothers breastfeed during the early postpartum period? At the time of discharge, 85 (85.8%) of the 99 women were recorded as breastfeeding (Table 3). Approximately fourteen percent (n=14) of the 99 women had switched to bottle-feeding prior to discharge. This left an infant chart population of 85 for follow-up.

The total number of infant outpatient records available for assessment was 32.9% (n=28) out of 85. Fifty-seven (67.1%) of the outpatient records were lost to follow-up. Of the 28 records reviewed, the duration of breastfeeding was examined at 2 weeks, 8 weeks, 16 weeks, and 24 weeks.

Research question number 2 stated, what proportion of military mothers continue to breastfeed at each specified sequence until age 6 months? The results in Table 4 show how many women continued to breastfeed beyond discharge from the hospital. Of the charts available, 67.9% (n=19) continued to breastfeed at 2 weeks. At 8 weeks there was a decrease in breastfeeding, with 35.7% (n=10) of the women continuing to breastfeed. Sixteen weeks and 24 weeks remained the same with 21.4% (n=6) of the women continuing to breastfeed.

Analysis of the demographics of this subset of women revealed: 75% (21) were white, 60.7% (17) were aged 25-31 years old, 67.9% (19) were multiparous, 39.3% (11) graduated high school and 11 graduated college, 50% (14) were professionals, and 89.3% (25) were married (Table 5). Due to the sample cell size statistical comparison can not be made.

Research question number 3, what are the effects of age, parity, marriage, education, occupation, delivery type and rank on the incidence and duration of breastfeeding? Duration was not included in the logistic regression due to insufficient number of outpatient records obtained.

Table 3 . Representation of Breastfeeding Initiation (N=99)

<u>Time</u>	<u>Breast</u>	<u>Bottle</u>
Initiated Breastfeeding after Delivery	99 (100%)	
Discharge from the hospital	85 (85.8%)	14 (14.1%)

Table 4. Representation of Breastfeeding Over Time (N=28)

<u>Time</u>	<u>Breast</u>	<u>Bottle</u>
Two Weeks	19 (67.9%)	9 (32.1%)
Eight Weeks	10 (35.7%)	9 (32.1%)
Sixteen Weeks	6 (21.4%)	4 (14.3%)
Twenty-four Weeks	6 (21.4%)	0

Table 5. Characteristics of the Breastfeeding Mothers Over Time (N=28)

	<u>Frequency</u>	<u>Percent</u>
Ethnicity		
Caucasian	21	75.0%
Black	4	14.3%
Asian	0	
Other	3	10.7%
Total	28	100%
Age		
18-24 yrs	5	17.9%
25-31 yrs	17	60.7%
32-40 yrs	6	21.4%
Over 40 yrs	0	0
Total	28	100%
Parity		
Primiparous	9	32.1%
Multiparous	19	67.9%
Total	28	100%
Education		
High School	11	39.3%
Some College (1-3yrs.)	6	21.4%

(Table 5 Continued)

	<u>Frequency</u>	<u>Percent</u>
College Degree	11	39.3%
Total	28	100%
Occupation		
Clerical	5	17.9%
Technical	9	32.1%
Professional	14	50.0%
Total	28	100%
Rank		
Enlisted	19	67.9%
Officer	9	32.1%
Total	28	100%
Marital		
Married	25	89.3%
Single	3	10.7%
Total	28	100%
Delivery		
Vaginal	22	78.6%
Cesarean	6	21.4%
Total	28	100%

The logistic regression for the incidence data revealed a significant p value of .04 for the variable of marriage (Table 6). Therefore being married appears to be a predictor of breastfeeding incidence.

Summary

In this chapter, the statistical methods for each of the research questions were identified. The statistical analyses utilized descriptive statistics and logistic regression to analyze the data and determine if significant relationships existed among the variables.

Table 6. Logistic Regression Results of Variables

<u>Variables</u>	<u>Number</u>	<u>OddsRatio(a)</u>	<u>P Value (b)</u>
Age			
18-24	33	1.57	.43
25-31	48	1.41	.52
32-42	18	1.0(c)	
Parity			
Primiparous	55	.81	.58
Multiparous	44	1.0(c)	
Education			
High School	39	.95	.95
Some College (1-3)	29	.38	.15
College Degree	31	1.0 (c)	
Occupation			
Clerical	30	1.28	.69
Technical	31	.43	.13
Professional	38	1.0 (c)	
Rank			
Enlisted	71	1.09	.92
Officer	28	1.0 (c)	
Delivery			
Vaginal	80	1.18	.70
Cesarean	19	1.0 (c)	
Marital Status			
Married	86	2.7	.04**
Single	13	1.0 (c)	

**p<.05

- Odds ratio calculated using condition coefficients from multiple logistic regression. Covariates in the model include: marital status, delivery type, rank, occupation, education, parity and age.
- P value from logistic regression for test of odds ratio equal to 1 (no effect).
- Reference group in factor.

Chapter 5

Discussion and Summary

Discussion of the findings

The purpose of this investigation was to examine the incidence and duration of breastfeeding in active duty women in the armed forces. It was a replication study of Sandercock (1993) whose convenience sample size was 20 women. The study was replicated in hopes of obtaining a larger sample size to provide more meaningful results. The study results, study limitations, and recommendations for future research are discussed in this chapter.

The predominate age of the women included in this study sample (n=99) were women in their middle twenties or early thirties (n=48). The sample was largely Caucasian (n=66) and married (n=86). Since the sample was obtained from a military hospital, the ethnic background is representative of the military culture, but it is not representative of the geographic area. According to the literature (Ellerbe, Atterbury, and West, 1993; Hill, 1991; Janke, 1993), the study sample appears representative of women who typically choose to breastfeed with regard to age, race, and marital status.

Research question number one regarding how many mothers breastfed during the early postpartum period was answered by a retrospective record review. The study sample had 85.6% (n= 85) of the active duty mothers breastfeeding at the time of discharge from the hospital. For the research question of what proportion of military mothers continue to breastfeed at each specified time period until 6 months, the time frames evaluated were 2, 8, 16 and 24 weeks. Of the 28 newborn records evaluated for duration, 68% (n=19) of the women continued breastfeeding at the 2 week period. At eight weeks 36% (n=10) of the women continued and at 16 and 24 weeks 21% (n=6) of the women continued to breastfeed.

In comparison to the Ross Laboratories study by Ryan (1997) the civilian populations' incidence of breastfeeding was 59.7%. In the present study military mothers were shown to have a higher percentage, 85.6% (n=85), of breastfeeding initiation compared to the civilian sector. At 6 months the Ross Laboratories study documented the breastfeeding rate was 21.6%. Unfortunately, the follow up sample size of this study was smaller than anticipated therefore the results are not generalizable to the larger military population.

In review, Sandercock's (1993) study results revealed that for the sample of 20 women studied 45% (n=9) were breastfeeding at discharge from the hospital. The present study found 85.6% (n=85) of the mothers breastfeeding at the time of discharge. Duration of breastfeeding in Sandercock's study found 40% (n=8) breastfeeding at 2 weeks, 5% (n=1) at 8 through 16 weeks and no women breastfeeding at 24 weeks. This current study found 68% (n=19) breastfeeding at 2 weeks, 36% (10) at 8 weeks, 21% (n=6) at 16 through 24 weeks. It should be noted, however, that the duration data is based on a sample size of 28 women.

Research question number 3 examined for the effects of age, parity, education, occupation, delivery type, marital status and rank on the incidence and duration of breastfeeding. Since only 28 complete records were obtained for evaluation of data, it was determined to be an insufficient number for a significant logistic regression to evaluate the duration of breastfeeding. So the logistic regression was prepared on incidence data alone. The results indicated that only marital status, being married was statistically significant at .04. Review of the literature (Wright, & Walker, 1983; Ellerbee, & et.al., 1993; Gielen, & et.al., 1991; Samuels, & et.al., 1985) does support the finding that the majority of women who breastfeed are married. Many authors (Martinez & Krieger, 1985; Ryan & Martinez, 1989; Kurinij et.al., 1989; Ryan et.al., 1990) have also

concluded that white, well-educated, higher income, women breastfeed more than lower income, minority, less educated, younger women.

Limitations

During the course of this study, two unanticipated events occurred. The first event was the inability of the researcher to view all of the 195 delivery records. Due to the privacy act the researcher was not allowed to pull the records personally, therefore was dependent on the staff of the records department to pull the records. To review the 116 maternal/infant delivery records took 4.5 months and the staff of the inpatient records unit were unable to discern when the other records could be pulled. Due to this fact and the time constraints of data collection to complete the study in a timely manner, the data from the additional 79 records were unable to be reviewed for inclusion in the study.

Obtaining the outpatient records for the breastfeeding data on duration proved to be equally difficult. The outpatient record search incorporated all 4 military bases located in San Antonio, Texas. Of the 85 charts that were recorded as breastfeeding at the time of discharge, only 28 newborn outpatient records could be located. The possible explanations could be the patient had relocated to a different city, the patient hand carried the records to appointments, or the patient used a civilian provider for the child's medical care.

Generalizability of the results of this study was limited to groups of active duty military mothers with similar demographic characteristics. The use of a convenience sample does not accurately represent the population of all military mothers, which threatens external validity. With a retrospective design, some subject's data were lost due to inability to obtain records. The breastfeeding duration sample size ($n=28$) being so small precluded any logistic regression analysis.

Theoretical Framework

The theoretical framework used for this study was based on the Role Theory developed primarily by R. Merton (Hardy & Conway, 1988). Role theory represents a collection of concepts that foretell how actors will perform in a role, or in different circumstances a certain type of behavior can be expected. With the encouragement of the positive research supporting breastfeeding as the best form of feeding a newborn, many mothers may feel obligated to breastfeed to fulfill their role as mother (Goodine & Fried, 1984). "For these women, life styles must change and so must their ways of meeting the role expectations associated with their traditional positions of mother and wife" (Hardy & Conway, 1988, p.211). According to Hardy and Conway (1988) role overload is a major obstacle to women in a single or dual-career family. The stress comes from having to choose between the options of coordinating the home and family activities and being goal directed at work. Most mothers desire to provide their newborns with the best possible nutrition but may start to feel overloaded with all of the demands motherhood and career (Auerbach, K., 1984).

Role overload is a possible explanation of the differences in breastfeeding patterns in both employed civilian mothers and active duty military mothers. Civilian and military mothers are usually given the standard maternity leave of 6 weeks after the birth of their child. When military mothers return to service it is a 24 hour, 7 day a week commitment (Sandercock, 1993). There are no time limits established for active duty military, they are expected to work whatever is asked of them. Military mothers can even be expected to leave their families for prolonged periods. Military mothers may feel less free to pump their breasts at work, if in an atmosphere or environment not conducive to pumping.

Based on the findings of this study, active duty military mothers are exceeding the Public Health Service's goals of 75% of mothers' breastfeeding in the early postpartum period. Initiation rates were high, 85.6% (n=85) for active duty women. Unfortunately due to sample cell size (n=28) the duration could not be accurately evaluated. Military programs need to continue to assist with initiation of breastfeeding. Teaching and support of breastfeeding duration should continue to be studied to learn what women need to continue breastfeeding beyond the first few weeks of the infants' life.

Recommendations

Recommendations for further study include replicating this study using a prospective, non-intervention design. The prospective design would eliminate some of the limitations imposed by loss of data due to inability to locate charts. Increasing sample size would improve the results as well. Evaluating whether the mother attended any childbirth classes or breastfeeding classes may be important factors to consider. Another suggestion would be to separate the women into 2 groups, married and single, and evaluate each for potential effects of the variables.

Information that may be important to gather on the breastfeeding patterns of military women should be evaluated. Age, ethnicity, education, occupation, delivery type, marital status and parity are common variables in many studies (Sandercock, 1993; Goodine & Fried, 1984; Wright, & Walker, 1983; Ellerbee, & et.al., 1993; Gielen, & et.al., 1991; Samuels, & et.al., 1985). Other important variables affecting breastfeeding that have been studied less frequently include hospital policies and practices, the medical provider's attitudes and practices with breastfeeding mothers (Simopoulos & Grave, 1984). Occupation related variables such as knowledge and attitudes of supervisors and peers in the workplace may also impact breastfeeding patterns. Available areas to pump and store breastmilk, as well as shift breaks to pump would be important to know (Piper

& Parks, 1996; Moore & Jansa, 1987). Attendance at childbirth classes, breastfeeding classes, spousal or significant others support of breastfeeding could have an effect worth evaluating (Janke, 1993). Auerbach & Guss (1984) and Kearney & Cronenewett, (1991) studies evaluated the effects of when the mothers returned to work such as 4 weeks versus 8 weeks. Goodine & Fried, (1984) found duration of breastfeeding correlated with when the decision to breastfeed was made. Therefore information regarding return to work and prenatal decision making are additional variables that could be studied.

Once the variables affecting breastfeeding incidence and duration are identified, intervention programs should be developed to actively encourage breastfeeding through 6 months. The programs need to include how to successfully breastfeed and return to work. Perhaps a support group for working, breastfeeding mothers would be a good way to provide instruction and support to these mothers and increase the duration of breastfeeding. Since marital status has been shown to be predictive of breastfeeding incidence, it could be beneficial to investigate and determine what single mothers need to initiate and continue breastfeeding.

Summary

In this chapter, the investigator presented a summary of the study, findings, conclusions, limitations, and recommendations for further research. Based on the available records (n=116), the results of this study documented breastfeeding initiation at 85.6% (n=85) out of the 99 women. Duration could only be documented for 28 mothers, so research question number 2 could not be answered as originally stated. The logistic regression identified one significant variable associated with breastfeeding. Being married predicted breastfeeding incidence. Additional research questions were noted which might lead to further investigations of this topic

that is highly regarded by the medical profession and of great interest for the health and welfare of all children.

Appendix A

Institutional Review Boards Approvals



The University of Texas
Health Science Center at San Antonio
7703 Floyd Curl Drive
San Antonio, Texas 78284-7830

Institutional Review Board
(Multiple Assurance #1403)

(210) 567-2351
FAX: (210) 567-2360

July 2, 1997

Carrie L. Dunne, MSN Student
School of Nursing
UTHSCSA

Dear Ms. Dunne:

Re: IRB Protocol # **E-967-092** Incidence and Duration of Breastfeeding in
Active Duty Women (Wilford Hall)

Reference your request, dated June 26, 1997.

This protocol has been determined EXEMPT under DHHS Regulation 46.101(b)(4): Research involving the collection or study of existing data, documents, records, pathological specimens, or diagnostic specimens, if these sources are publicly available or if the information is recorded by the investigator in such a manner that subjects cannot be identified, directly or through identifiers linked to the subjects.

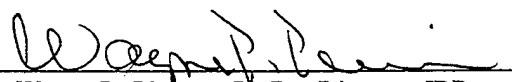
Approval of this study under this category is being given because the identifiers will be used temporarily. It is imperative that all information linking the code numbers and subjects is destroyed upon completion of data collection.

RESPONSIBILITIES OF PRINCIPAL INVESTIGATOR:

- (1) submit for review and approval by the IRB all modifications to the protocol or consent form(s) prior to the implementation of the change;
- (2) for funded projects, submit a copy of renewals/continuations and advise whether the study of specimens, records, or human subjects has changed from the original submission; and
- (3) submit a **Status Report** for continuing review by the IRB. A form will be sent to you annually to verify the status of the activity.

Source of Funding: Principal Investigator

NEXT IRB REVIEW: JULY 1998


Wayne P. Pierson, Ph.D., Director, IRB



Wilford Hall Medical Center
Institutional Review Board (IRB)
NOTICE OF ACTION REGARDING IRB REVIEW

4 Aug 97

MEMORANDUM FOR HSR/LT COL JOSEPH O. SCHMELZ

FROM: 59MDW/HSRP (Protocol Support Services) (2-7143)

SUBJECT: EXEMPT PROTOCOL HSRP# 97EX147 "INCIDENCE AND DURATION OF
BREASTFEEDING IN ACTIVE DUTY MILITARY WOMEN"

1. Your AFI 40-403 EXEMPT PROPOSAL received expedited review on behalf of the WHMC Institutional Review Board by the Director, Research Division on 3 Aug 97. It was approved as written. Your study is approved and may begin once you come by the Protocol Support Services office to sign the signature page and enter the date of study initiation (must be after date of final approval). This second signature indicates activation of the protocol.

2. Please forward a copy of the final report to HSRP (Protocol Support Services) when the study is completed. Investigators will need to periodically report their protocol's progress (see Additional Information Section, in the Clinical Investigation Investigator's Guide). We recommend keeping progress notes on all protocols. Laboratory notebooks are available through the Research Division's Laboratory Supply Section, ext 2-7159, or the 59th MDW Non-Medical Supply (ordered through your supply personnel). NOTE: Bound notebooks may be required for protocols being considered for subjects.

Please note items marked with an "x" below that apply to your study:

☐ FY97 Research Division funding in the amount of was approved. Please contact SSgt Fagin, at ext 2-7141 to make an appointment to discuss the procurement of requested supplies, equipment, service contracts or animals. At no time are you authorized to procure any of these items through channels other than the Research Division. YOU ARE NOT AUTHORIZED TO USE YOUR SECTION'S O&M FUNDS TO SUPPORT YOUR PROTOCOL.

☐ Please contact Ms Barbara Gaiser, External Resources Coordinator, ext 2-5203, regarding documentation and receipt of external resources.

PATTY ALLEN
Protocol Coordinator
Protocol Support Services

Info copy to:

- ☐ 59 MDW/CV (Col. Kilpatrick)
- ☐ SSgt Fagin w/proposal
- ☐ Ms Gaiser w/Proposal

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Vita

Carrie Lorene Dunne was born in Greenfield, Indiana on January 5 1964, daughter of Larry and Rebecca Crump. She graduated from New Palestine High School in New Palestine Indiana in May of 1982. A Bachelor of Science in Nursing was earned at Ball State University in Muncie Indiana in May of 1987. Prior to graduation, she was inducted into Sigma Theta Tau International Nursing Honor Society. After graduation she worked at St. Vincent's Hospital in Indianapolis Indiana in the Cardiac Recovery Unit. In the same year, she was commissioned as an officer in the United States Air Force and completed a 6 month internship in all areas of obstetrics at Wright Patterson Air Force Base. After the internship program she worked for one year in a level 2 Neonatal Intensive Care Unit, then transferred to the Labor & Delivery/Postpartum Unit. In 1990, she was transferred to Torrejon Air Force Base in Torrejon Spain where she worked in the Labor & Delivery/Postpartum/Nursery Unit until its closure in March 1992. At that time she became the nurse manager of the Primary Care unit until base hospital closure was complete. During her stay in Spain, she married James Stanley Dunne July 4, 1991 on the Rock of Gibraltar. In August of 1992, she was transferred to Wilford Hall Medical Center in San Antonio Texas. She worked for 1 year in the Pediatric Intensive Care Unit before transferring to Labor & Delivery for the next year. In 1994, she transferred to the Primary Care Clinic and entered the Graduate School of Biomedical Sciences, University of Texas Health Science Center at San Antonio in 1995. On December 12 1995 she delivered her first child, Rebecca Anne Dunne. In August of 1996 she was selected by the Air Force Institute of Technology for full-time study to complete her master's program.