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Early Term Infant Care: Hospital Utilization and Breastfeeding Practices

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EARLY TERM INFANT CARE: HOSPITAL UTILIZATION AND BREASTFEEDING PRACTICES

by

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EARLY TERM INFANT CARE: HOSPITAL UTILIZATION AND BREASTFEEDING PRACTICES

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Early term infants (ETI), with gestational ages from 37 to 38 weeks, have higher morbidity and mortality rates when compared with later term infant counterparts born at 39 to 41 weeks. Although this newly identified term infant subcategory is gaining attention, the immediate and long term health outcomes and care needs of ETI remain largely unexplored. The purpose of this research project was to examine the current research documenting ETI health and explore care practices that are currently utilized to promote ETI health. The original research study describes care practices used to promote health for ETIs born in Louisiana in 2004 and examines their care in the early postpartum period. The Conceptual Model for Late Preterm Infant Care was used as the framework to examine care. The research design was retrospective descriptive and care experiences were examined through secondary data analysis utilizing Louisiana's Pregnancy Risk Assessment Monitoring System (LaPRAMS) questionnaire for 2004.

Keywords: Early term infant, infant/neonatal mortality, hospitalization, breast feeding, Pregnancy Risk Assessment Monitoring System (PRAMS)

Chapter 1: Introduction

The health and well-being of Louisiana infants is a major public health concern. The most recent data for infant mortality rate (IMR) in Louisiana was 8.8 deaths per 1,000 live births (Department of Health and Hospitals [DHH], 2012). This rate was well above the national IMR of 6.42 (Kocjanek, Xu, Murphy, Minino & Kung, 2011). Louisiana's record of poor infant health has been related in part to the high rates of preterm birth (12.4%) and low birth weight infants (10.7%) [DHH, 2012]. These occurrences have been identified among the most frequent causes of infant mortality in the U.S. (Kochanek et al.). Although monumental strides in infant health have occurred, the U. S. remains behind its Healthy People 2020 maternal infant child health IMR goal of 6.0 infant deaths per 1,000 live births annually (U. S. Department of Health and Human Services, 2012). The lag in progress in lowering the IMR since 2000 has been a cause for concern among governing bodies and researchers alike (MacDorman & Mathews, 2009).

Overview of the Research Study

Research comparing IMR in the U.S. with Europe revealed that infants born at a gestational age of 37 weeks or more, the U.S. IMR was higher than for most European countries (MacDorman & Mathews, 2009). These infants include those born at *early term* which is defined as birth at 37 to 38 weeks gestation. Early term infants have become a U. S. public health concern due to their increasing numbers and poor health outcomes. ETI have numerous documented health risks such as increased respiratory

morbidity, and increased neonatal and infant mortality rates (Gyamfi-Bannerman, 2011). Cheng et al (2008) studied over 2 million low-risk women who delivered at term gestation to examine outcomes by completed weeks (37, 38, 39, 40, and 41) infant subgroups. They discovered that infants born at 37 and 38 weeks gestation had higher risk for developing hyaline membrane disease and reported that the probability for developing serious pulmonary disease was highest at 37 weeks (Cheng et al., 2008). Melamed et al. (2009) examined the effect of gestational age at delivery (34-36 weeks compared with 37-41 weeks) on 2,478 infants born by spontaneous low-risk delivery. Findings demonstrated an increased risk for respiratory distress syndrome, intraventricular hemorrhage, hypoglycemia and jaundice requiring phototherapy that were continuous in nature and did not reach a baseline until 39 weeks gestation. This led these researchers to surmise that "the relationship between gestational age and neonatal morbidity was continuous in nature" and decreased incrementally until about 39 weeks (Melamed et al.). In view of these facts, health care professionals should explore all possible contributors to poor infant health and strive to gain insight into the numerous variables that effect infant morbidity and mortality.

Overall Purpose of the Study

This research trajectory was initiated to discover more about infant mortality and morbidity which affects Louisiana infants disproportionately. The author's twenty-nine year nursing career has been spent caring for infants and children, and teaching nursing courses related to maternal-child health. When the decision to pursue a terminal research degree in nursing was made, the author deliberately chose to follow her passion to help

the vulnerable infants in her home state. This passion was sparked by the mentoring of Dr. Sally Northam, a maternal-child health researcher whose knowledge and familiarity with secondary data use afforded the author an opportunity to gain a similar experience with her original nursing research.

Introduction of the Articles

The first manuscript entitled *Early Term Birth Understanding the Health Risks to Infants* reflects the current state of the scientific knowledge as it relates to the ETI. It examines research on the ETI's morbidity risks and mortality rates and highlights the potential care needs of these infants in the immediate postpartum period. It was written for the peer-reviewed journal *Nursing for Women's Health* and published in April 2012 by the Association of Women's Health, Obstetric and Neonatal Nursing (AWHONN) journal. The journal's target audience is clinical nurses working in maternal child health settings.

The second manuscript entitled *Maternal Report of Early Term Infant Hospital Utilization and Breastfeeding Practices in Louisiana* is a report of original research documenting care practices for early term infants born in Louisiana in 2004. This research focus was chosen to fill a gap in information concerning the documented nursing and familial care needs of early term infants. Since Louisiana ranked 48th in infant mortality among U.S. states for 2008 (DHH, 2010) and ranked 50th in the nation for breast feeding rate, (53.7% of LA infants of all races were ever breast fed in 2008[DHH]), infant care requirements to promote health and feeding practices were targeted. This retrospective descriptive study was performed using

secondary data analysis of the Louisiana Pregnancy Risk Assessment Survey (LaPRAMS) from 2004. Due to Hurricane Katrina, LaPRAMS data was not collected for 2005- 2006, and had a low response rate (< 55%) for 2007, 2008 and 2009. The Conceptual Model for Care of the Late Preterm Infant, (Medoff-Cooper, Bakewell-Sachs, Buus-Frank & Santo-Donato, 2005) was used to derive the study. This model identifies four major components (physiologic functional status, care environment, family role, nursing care) of holistic care necessary to promote healthy outcomes for the late preterm infant. It has been used as a systematic means to guide the development of evidence-based care guidelines for vulnerable preterm infants. The model was used as a guide to examine care needs for the recently recognized at-risk ETI. The model component physiologic functioning status was measured by length of stay (birth hospitalization) and breastfeeding initiation and duration. Care environment was examined by documenting the need for neonatal intensive care admission. Family role (maternal) was examined by measuring breastfeeding initiation barriers. Examination of these model components was accomplished to establish current care practices needed for ETI in Louisiana and to determine if they were different from that of the full term infant. Knowledge gained may prove useful for guiding the direction of health care dollars by documentation of care requirements for ETI in the state. Since addressing infant morbidity is a huge need, ultimately this information may be useful to support or refute the need to establish evidence based practice guidelines for caring for the vulnerable ETI.

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Chapter 2: Early Term Birth Understanding the Health Risks to Infants*

Abstract

Early term birth, which occurs at 37 to 38 weeks gestation, is often elective and can carry significant health risks to infants, including short-term and long-term health outcomes. Nurses and other health care providers involved in the care of pregnant women and infants need to be aware of these infants' physiologic vulnerability and potential short-term and long-term care requirements. Nurses can educate patients and raise awareness of the risks associated with early term birth.

Keywords: early term birth, early term infant, elective induction, cesarean, neonatal mortality

*Written permission to include this manuscript was provided (Appendix A).

Manuscript

Nature is intentional. Yet the ideal length of human gestation has been regarded as arbitrary and is often adjusted to meet the demands of modern society (Oshiro, Henry, Wilson, Branch & Varner, 2009). Normal birth or spontaneous physiologic birth has been threatened by high rates of elective induction and cesarean deliveries (Broussard & Broussard, 2011). Thus far, the immediate and long-term health impact of a delivery that takes place on the cusp of prematurity (37 weeks gestation) remains largely unexplored.

Term birth has been viewed as a malleable entity that may be modified without maternal or infant consequences. It has been manipulated for parental or physician preference. The current definition of a term infant (completed gestational age of 37 to 41 weeks) was established subjectively by the Second European Congress of Perinatal Medicine and has been in place since 1970 (Fleischman, Oinuma & Clark, 2010). Arguably, this definition has promoted a sense of false reassurance when delivering an infant whose gestational age is near the term benchmark (Bakewell-Sachs, 2007; Engle & Kominiarek, 2008). Physicians and patients may feel comforted by reaching this gestational milestone, and current data on elective induction indicate that most place a low value in prolonging pregnancy once term gestation is reached (Simpson, Newman & Chirino, 2010).

The rate of early term births (babies born 1 to 3 weeks short of term) has risen substantially in recent years (Martin, Kirmeyer, Osterman & Shepherd, 2009). Most of these births occur due to preventable elective induction (Main et al., 2010), even though this is in direct opposition to the recommendation of the American College of

Obstetricians and Gynecologists (ACOG, 2009) that no elective deliveries occur before 39 weeks gestation (Ventolini, Neiger, Hood & Belcastro, 2006). Writing about the implementation of a program to reduce elective inductions, Oshiro et al., (2009) state that, "Many physicians didn't appreciate the morbidity of infants born before 39 weeks and wanted to maintain autonomy in determining the timing of delivery" (p. 805). This attitude toward early term births may be due in part to the relatively low risk of poor outcomes for early term infants (when compared to preterm infants) and the fact that obstetricians do not manage the care of these infants.

Public opinion maintains that early term infants and full-term infants share similar health outcomes. However, a recent study comparing mortality rates for more than 40 million single born infants delivered from 1995 to 2006 does not support this belief (Reddy et al., 2011). When comparing early term infants with full-term infants, the researchers discovered that early term infants had higher neonatal, postnatal and infant mortality rates. Specifically, early term infants displayed significantly higher neonatal and infant mortality rates consistently over the study period (Reddy et al.).

Nurses and other health care providers caring for pregnant women and newborns need to be aware that infants born early term are at increased risk for poor health outcomes in both the immediate and long-term period. The risks of morbidity and mortality among early term infants need to be better communicated to and understood by pregnant women and the health care professionals who care for them.

Scope of the Issue

U.S. birth data demonstrate that over the past decade the gestational age for spontaneous births, births following premature rupture of membranes (PROM) and births following medical intervention declined from 40 weeks to 39 weeks (Davidoff et al., 2006) (see Box 1). These trends were matched by a noteworthy increase in births on the earlier side of term, including infants born at 37 to 39 weeks gestation, which accounted for 17.5 percent of all live births (Davidoff et al., 2006; Main et al., 2010; Oshiro et al., 2009). At the same time, post-term births (> 40 weeks) have markedly decreased. The singleton birth category of delivery also changed significantly, with the greatest increase in births due to medical intervention (cesarean and labor induction) occurring at 37 to 39 weeks (Davidoff et al., 2006).

It is common for providers to offer elective induction to pregnant women who have reached term gestation. In a study of more than 3,000 pregnant women, which sought to determine if education relating to risk with elective induction affected delivery choice, researchers discovered that obstetricians offered elective induction to nearly 70 percent of pregnant nulliparous study participants (Simpson, Newman & Chirino, 2010). Almost half of the women offered the option had an elective induction. Alternately, when an elective induction was not offered, 90.8 percent of women did not have one (Simpson et al., 2010). This finding points to the influence of obstetricians in women's delivery decisions. Ultimately, it was discovered that presenting specific risks of elective induction (including cesarean birth, longer labor and neonatal morbidity) during

childbirth education classes significantly reduced the elective induction rate (Simpson et al., 2010).

A patient's request for early delivery before her due date suggests a misunderstanding of fetal development (Bakewell-Sachs, 2007). Many patients are confused about when a pregnancy reaches "full term" and, in one study, slightly more than half (50.8 percent) believed that full term was 37 to 38 weeks (Goldenberg, McClure, Bhattacharya, Groat & Stahl, 2009). Only a fourth (25.2 percent) considered 39 to 40 weeks gestation as full term. When asked about the earliest point in pregnancy when safe delivery of an infant could occur if no medical complications affected the delivery, the majority of women chose 34 to 36 weeks (51.7 percent) versus 39 to 40 weeks (7.6 percent) (Goldenberg et al.).

Some researchers have begun to stratify gestational age in weeks, which has permitted closer examination of early term infants as a unique gestational age subgroup. This has allowed for comparison health outcomes in early term infants versus full-term infants (Engle & Kominiarek, 2008; Fleischman et al., 2010; Main et al., 2010). Due to the increasing data available to examine health outcomes for early term infants, researchers believe that focus on the early term infant is appropriate and that these infants stand to gain from more careful assessment and care (Fleischman et al. 2010).

Morbidity and Mortality

Infants born early term are at increased risk for morbidity and mortality (Fleischman et al., 2010; Osrin, 2010; Reddy et al., 2011), and have an increased risk of

neonatal and infant death compared to infants born at 39 weeks and beyond (Pulver, Guest-Warnick, Stoddard, Byington, & Young, 2009). Mortality is increased significantly in small-for-gestational-age early term infants (Pulver et al., 2009). Recent findings demonstrate a substantial variation in mortality rates among early term infants by racial/ethnic group (Reddy et al., 2011). Early term non-Hispanic black infants had higher neonatal mortality rates (40 percent higher) and postneonatal mortality rates (80 percent higher) when compared to early term non-Hispanic white infants. While the top causes of neonatal and postneonatal death identified for early term and term infants are similar, Reddy and colleagues noted that infant death due to sudden infant death syndrome, accidents and assault respond well to nurse-initiated education and health intervention and should be targeted. Therefore, pregnant women and their early term infants may benefit from more deliberate teaching about these specific risks for infant mortality related to early term birth.

In another study, the risk for morbidity was found to nearly double for each week of gestation before 39 weeks that an infant was delivered (Shapiro-Mendoza et al., 2008). Other studies have found early term birth associated with increased neonatal intensive care (NICU) admissions, respiratory distress syndrome, ventilator use, transient tachypnea of the newborn and feeding challenges (Main et al., 2010; Oshiro et al., 2009; Tita et al., 2009). Overall, the incidence of poor health outcomes and neonatal complications decreased with increasing gestation (up to 39 weeks). The risk of adverse health outcome/complication (neonatal death or severe adverse event) after repeat cesarean delivery was increased at 37 weeks and 38 weeks (Tita et al., 2009). Poor prognosis (death/severe neurologic conditions) and severe respiratory disorders requiring

ventilator treatment declined significantly between 34 and 38 weeks yet did not reach stability until 39 weeks (Gouyon et al., 2010). Oshiro et al. (2009) found that reducing the prevalence of elective delivery before 39 to 41 weeks resulted in significant declines in meconium aspiration, Apgar scores less than 5 at 1 minute and cesarean sections due to fetal labor intolerance. All of these findings indicate that prolonging pregnancy through 39 weeks gestation can play a significant role in decreasing morbidity and promoting an infant's optimal clinical condition.

Hospital Utilization

Oshiro et al. (2009) found a significant increase in NICU admission in infants born as a result of a normal pregnancy at 37 and 38 weeks when compared with full-term infants born beyond 39 weeks (Oshiro et al., 2009). The rate of NICU admission for infants born at 37 weeks was 8.85 percent compared to 3.34 percent for infants born at 39 weeks gestation. According to Clark et al. (2009), nearly 18 percent of infants delivered electively at 37 to 38 weeks without medical indication were admitted to a special care unit for 4.5 days, whereas only 4.6 percent of infants delivered at 39 weeks or beyond required special care admission for more than 5 days. These findings suggest that the distinction of term gestation as marked by 37 completed weeks has no maternal or fetal physiologic basis and may lead to inappropriate care (Clark et al., 2009).

Respiratory Risks

Escobar, Clark and Greene (2006) performed an examination of 47,495 newborns born at six Kaiser Permanente medical centers in California to document differences in

short-term outcomes between late preterm and term infants. When determining the risk for respiratory distress requiring supplemental oxygen, significant physiologic instability and the need for mechanical ventilation, 37-week-gestational-age infants were found to be at increased risk for all factors (Escobar et al., 2006). This study supported the conclusion that the risk for respiratory disorders increased steeply as gestational age fell below 38 weeks. Cheng et al. (2008) studied more than 2 million low-risk singleton infants born in the U.S. in 2003. They discovered an increase in hyaline membrane disease in infants delivered at 37 and 38 weeks and a twofold increase in mechanical ventilation requirements in infants born at 37 weeks (Cheng et al.).

Reaching the threshold of fetal lung maturity may not have the same clinical results for early term infants. The American College of Obstetricians and Gynecologists suggests that an assessment of fetal lung maturity be performed if delivery before the 39-week milestone is considered (Ventolini et al., 2006). Of 527 infants delivered electively before 39 weeks with documented fetal lung maturity per lamellar body count > 30,000/uL, 22 infants exhibited cases of respiratory distress syndrome or transient tachypnea of the newborn after delivery. When stratified for gestational age at delivery (35, 36, 37 and 38 weeks) and lamellar body count, risk for respiratory complications did not decrease as gestational age increased (Ventolini et al., 2006).

Bates et al. (2010) also found that the risk of neonatal respiratory morbidity in infants delivered at 36 to 38 weeks with documented fetal lung maturity remained higher when compared to infants born at 39 and 40 weeks. Early delivery after documented fetal lung maturity was linked with a nearly twofold increase in transient tachypnea of the

newborn, respiratory distress syndrome and the need for respiratory support (Bates et al., 2010).

Feeding Challenges

Feeding problems are among a variety of transition-to-extrauterine life issues that early term infants face, and early term infants appear to be at significantly increased risk for feeding problems (Bates et al., 2010; Main et al., 2010). This may be due to the fact that synchronization of sucking-swallowing is potentially incomplete before 38 weeks, and sucking and rooting reflexes are not fully developed until 36 to 38 weeks (Blackburn, 2007). Gewolb and Vice (2006) compared feeding episodes of low-risk preterm and term infants a few days (in term infants) to a few weeks (in preterm infants) after delivery. They discovered that term infants had an unexpectedly higher variation of shallow breathing than preterm infants and considered that this was likely due to the high data points contributed by 37- and 38-week-gestation infants. In addition, respiratory frequency, tidal volume and transcutaneous oxygen levels decreased during oral feedings (sucking) in preterm (34-35 weeks) and in term (36-38 weeks) infants (Neu, 2006).

Breastfeeding success rates among physiologically immature early term infants have not been fully explored, although early term gestations and breastfeeding have been independently related to increased hospital admission rates (Radtke, 2011). It is known that late preterm infants are at greater risk for poor breastfeeding establishment compared to term infants, and breastfeeding complications "have emerged as a preeminent health concern" in the late preterm infant population (Radtke, 2011, p. 22). Escobar et al., (2002) discovered that in infants born between 36 and 39 weeks, the factor contributing

most to re-hospitalization for dehydration was exclusive breastfeeding. This finding indicates that early term infants may be less capable of sustaining breastfeeding in a manner that meets their physiologic needs.

Long-Term Outcomes

MacKay, Smith, Dobbie, and Pell (2010) compared term infants to early term infants and demonstrated an increased risk of special education needs in the early term subgroup. Special education need was defined as a learning difficulty that requires special educational intervention and included dyslexia, autism, Asperger's syndrome and attention deficit and hyperactivity disorder (ADHD). They reported that there was no evidence of a protective threshold effect at 37 weeks gestation and that special education needs decreased with increased gestational age. This trend continued across all term gestations. The researchers suggest that studies that measure gestational age by uniform preterm versus term categories have masked the effect of gestation (by week) on infant outcomes (MacKay et al.).

The cost of early educational intervention by gestational age has been examined, and provision of this service should be considered in the long-term cost of prematurity (Clements et al., 2007). It was discovered that the cost of educational intervention (by age 3 years) for infants born at 27 to 40 weeks gestation was higher when gestational age decreased. The average cost for educational intervention for children born at 37 to 38 weeks was $4,671 and $5,113, respectively, while the average cost for children born at 39 and 40 weeks was $4,409 and $4,207 (Clements et al.).

Early term infants were found to be at risk for diagnosis of ADHD severe enough to require prescription medication (Lindstrom, Linblad & Hjern, 2011). Risk for ADHD in 37- to 38-week-gestation infants was increased by nearly 20 percent over that of later term and post-term infants. After ruling out most causes traditionally associated with this diagnosis, maturational lag in brain development was considered to be the most likely link between immature gestational age and ADHD (Lindstrom, Linblad & Hjern, 2011).

Increased risk for hospital admission for psychiatric disorders in adolescence and young adulthood has recently been linked with increased degree of prematurity (Lindstrom, Linblad & Hjern, 2009). A Swedish study that included more than 500,000 individuals born from 1973 to 1979 found that early term infants had a slightly increased risk for suffering from psychiatric disorders requiring hospitalization. Because moderately preterm and early term births accounted for 85 percent of the risk attributed to prematurity, these infants are in need of more attention through research, and psychiatric morbidity prevention strategies are needed (Lindstrom et al., 2009).

What Can Nurses Do?

Nurses, as well as other health care providers who care for pregnant women and newborns, need to be aware of the infant health risks associated with early term birth and to understand the role they play in potentially improving outcomes (see Boxes 2 and 3). Understanding the unique health risks of infants born early term will help nurses tailor their care to this population. Monitoring early term infants closely for signs of respiratory distress will allow for early recognition of respiratory and feeding problems, timely

treatment of borderline abnormalities and hopefully avoidance of negative health outcomes.

Nurses who understand that early term infants often require specialized nursery care should not be reluctant to seek this source of help when needed. If routine nursery care is indicated, early term infants should be identified and monitored more frequently for temperature instability and feeding difficulties. A visual tagging system for the infant and an indicator attached to the electronic health record or the patient chart will help call attention to these early term infants.

Breastfeeding mothers may require additional support as they attempt to establish a nutritional source for their neurologically immature infant. These patients will need additional discharge education focused on review of prevention strategies for the major causes of early term infant mortality that have been shown to be decreased through intervention (e.g., sudden infant death syndrome, trauma and accidents).

Nurses can talk to hospital-based childbirth educators and encourage them to include fetal development and early term birth health risk information in childbirth classes. Nurses can provide lay literature to the patients they care for in both the hospital and community setting (see Get the Facts for resources). Nurses can participate in educating patients and health care providers about normal birth (Broussard & Broussard, 2011) and the prevention of non-medically indicated delivery before 39 weeks. Sharing the facts about the benefits of term birth through media outlets (radio, public service announcements, newspaper, letters to the editor) and social networks would also be helpful to disseminate this valuable information to a wide audience (see Box 4). In

addition, because the main factors driving up early term delivery rates are elective induction and cesarean deliveries, nurses may wish to consider examining their hospital's early term delivery rate and consider advocating for measures to decrease early elective delivery (see Box 5).

Conclusion

Preterm birth has garnered much attention due to the associated morbidity, mortality and cost of care. More recently, the rise in births of late preterm infants has captured public attention and findings related to birth outcomes and long-term health outcomes have been studied. A national mood for health cost scrutiny and a concern for dwindling resources have made the focus on better health outcomes a priority. The reported increase in morbidity among late-preterm infants may be due in part close monitoring of these infants for medical complications (Engle et al., 2007). Bakewell-Sachs (2007) questioned whether all the focus on improving survival for very preterm infants had caused health professionals to become desensitized to the health problems related to late preterm birth. This same case may be argued for the current lack of attention to early term births. Early term delivery is, to many people, a convenience of modern life, and many pregnant women eagerly accept it because they're not aware of the potential risks to their infants. Patient education and interventions to improve health outcomes are what nurses do best, and early term deliveries represent a situation where information and vigilance can have life-long consequences.

Get the Facts

AWHONN: Go the Full 40 Campaign

www.gothefull40.com

March of Dimes: Why At Least 39 Weeks is Best for Your Baby

www.marchofdimes.com/pregnancy/getready_atleast39weeks.html

March of Dimes: Elimination of Nonmedically Indicated Elective Delivery Toolkit

http://www.marchofdimes.com/catalog/product.aspx?productid=5217&categoryid=210&productcode=34-2483-10

Box 1. Changes in Singleton Birth Gestation and Delivery Type 1992 to 2002

Birth Year	1992	2002
Average Gestational Age at Birth*	40 weeks	39 weeks
Type of Delivery		
Spontaneous	68.1%	56.8%
Medical Intervention	28.9%	41%
Premature Rupture of Membranes	3%	2.2%

*Includes all delivery types

Box 2. Health Risks Associated With Early Term Birth

Increased neonatal and infant mortality
Increased need for specialized neonatal care
Increased risk for respiratory morbidity
Increased risk for feeding difficulties
Increased need for ADHD treatment and special educational interventions

Box 3. Caring for Early Term Infants

Assess frequently for signs of respiratory difficulty.
Observe closely for feeding difficulties, such as poor suck-swallow and breathing synchronization and provide additional parent teaching and support.
Monitor more frequently for temperature instability.
Educate parents on the chief causes of infant mortality, such as SIDS, assault and accidents.

Box 4. Speak Up

Use professional opportunities and social interactions to discredit the myth that there are no risks to delivering a baby a few weeks early.

Explain to health professionals that failure to understand and convey the risks associated with early term birth contributes to the willingness of pregnant women to deliver early as a matter of convenience or pregnancy fatigue.

Ensure that pregnant women and their families know the risks of early term birth in order to diminish the urge to deliver early.

Box 5. Changing Hospital Policy on Early Term Delivery

Examine your hospital's record on rates of early scheduled deliveries at The Leapfrog Group website (www.leapfroggroup.org/tooearlydeliveries).

Explore the possibility of instituting the March of Dimes Elimination of Non-Medically Indicated Elective Delivery: Quality Improvement Toolkit (see www.marchofdimes.com/catalog/product.aspx?productid=5217&categoryid=210&productcode=34-2483-10).

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Chapter 3: Maternal Report of Hospital Utilization and Breastfeeding in Louisiana Early Term Infants

Abstract

Objective: To examine existing care practices for early term infants during hospitalization and in the early postpartum period in order to determine if early term infant care differs from full term infant care.

Design: Retrospective descriptive study

Setting: Term infants born in Louisiana in 2004

Participants: Stratified systematic sample of early term (N= 425) and full term (N= 685) infants.

Methods: Live-born term infants whose mothers participated in the Louisiana Pregnancy Risk Assessment Monitoring System (LaPRAMS) survey were eligible for study inclusion. Early term and full term infant care outcomes including Neonatal Intensive Care Unit (NICU) admission, length of stay, breastfeeding initiation and duration, maternal reasons for non-initiation of breastfeeding, and predictors of breastfeeding duration were compared in the early postpartum period.

Results: Hospital utilization (NICU admission, length of stay) and breastfeeding practices (breastfeeding duration) do not differ significantly between ET and FT infants. Differences in breastfeeding ever (yes, no) between infant groups was marginally different ($p = 0.08$). Maternal reasons for non-initiation of breastfeeding (mom too sick/taking medications and mom didn't like) were marginally significant between infant

groups (p= 0.06). Breastfeeding duration (< 4 weeks) predictors included Black race (p < 0.001), maternal education of high school or less (p < 0.001), non-married status (p = 0.006) and poor maternal health (p = 0.001).

Conclusions: Early care experienced (NICU admission, length of stay after birth, breastfeeding practices) for vaginally born ET and FT infants did not differ significantly. PRAMS data from 2004 was used because of non-collection of data for 2005 and 2006 due to Hurricane Katrina and a reduced survey response rate for 2007 and 2008. Further research is needed to examine the ramifications of ET births on a larger infant sample that includes term infants born by cesarean section.

Keywords: Early term infant, hospitalization, breastfeeding, PRAMS

Manuscript

The number of infants born a few weeks short of "term" has risen markedly in the United States from 1990 to 2006. During this time, earlier term births (37 to 39 weeks) have risen, while post-term births (41 weeks and beyond) have declined (Martin, Kirmeyer, Osterman, & Shepherd, 2009). Full term infants (37-41 weeks gestation) have been considered a uniform group, and have been used to compare birth risks and health outcomes against preterm and post-term infants (Fleischman, Oinuma & Clark, 2010). Research has begun to demonstrate that health outcomes for all term infants are not the same, yet the "public perception that the early term and full term periods are equivalent, … homogenous, and low-risk" remains (Reddy et al., 2011, p. 1279)."

Engle and Kominiarik (2008) clearly identified a new full term infant subcategory labeled "early term" which included infants born at $37^{0/7}$ to $38^{6/7}$ completed weeks gestation and distinguished them from full term infants born at $39^{0/7}$ to $41^{6/7}$ weeks gestation. This demarcation was favored by Fleischman et al. (2010) and is supported by emergent research documenting the vulnerabilities of the early term infant (ETI). These vulnerabilities included a higher incidence of respiratory, developmental and behavioral morbidities as well as increased neonatal and infant mortality (Engle & Kominiarik; Engle, 2011; Reddy et al., 2011). Elective delivery of ETIs is discouraged (Main et al., 2010) and researchers have recommended the examination of early term infant outcomes in order to develop strategies to promote infant health.

Significance

In 2010 the National Center for Health Statistics (NCHS) report on birth data for 2008 examined the ETI subcategory separately for the first time, and documented the ETI birth rate in the United States was 27.8% (Martin et al., 2010). According to the report, this new category was delineated in response to the March of Dimes and other maternal child health advocacy groups who recommended separate data collection for ETIs and full term infants (FTI). Due to the increasing research exploring health outcomes for ETIs, researchers contend that data separation (ETI and FTI) would be beneficial in order to gain a clearer view of their health needs and assist in the development of strategies to improve their birth outcomes (Fleischman et al., 2010).

Researchers haves found higher risks for morbidity in ETIs than for FTIs born at 39 to 41 weeks, and have suggested that the current opinion of term infant including 37 to 41 weeks gestation should contain more gradation (Gouyon et al., 2010). Infants delivered electively between 37 and 38 weeks experience increased risk for NICU admissions, increased respiratory distress syndrome (RDS), transient tachypnea of the newborn (TTN) and increased newborn feeding problems (Main et al. 2010, Tita et al., 2009). ETI birth is not clearly understood, yet factors thought to contribute to their occurrence include increased medical scrutiny, multi-fetal pregnancy, increased stillbirth rates at 39 weeks, and maternal/family convenience reasons (Engle & Kominiarek, 2008). Spong et al. (2011) reported that pregnancies experiencing fetal (congenital anomaly, multiple gestation) and/or maternal complications (placenta previa, preeclampsia) often benefit from preterm and early term delivery and are indicated to improve health

outcomes. Timing of elective early term birth may be indicated for promoting the balance of optimal health of the mother, the infant or both (Spong et al). No matter what leads to the birth of an ETI, nurses and other healthcare professionals need to be aware that these infants are at increased risk for mortality and morbidity (immediate and long term) and ensure that their care needs are recognized and managed appropriately.

ETI face increased morbidity and mortality risks (Fleischman et al., 2010; Osrin, 2010; Tita et al., 2009). A study comparing mortality rates in over 40 million single born infants delivered from 1995 to 2006 showed significantly higher neonatal and infant mortality rates in ETI consistently over the study time period (Reddy et al., 2011). The risk for morbidity doubled for each week of birth earlier than 38 weeks an infant was delivered (Shapiro-Mendoza et al., 2008). Morbidity risks included a significant increase in neonatal intensive care (NICU) admission (Escobar, Green, Hulac, et al., 2005; Kamath, Marcotte & DeFranco, 2011; Oshiro et al., 2009; Tita et al.), respiratory distress syndrome (RDS), and ventilator use in infants born at 37 & 38 weeks compared with infants born later term (Oshiro et al.; Tita et al.). At 37 weeks, the odds of RDS were 3-fold greater (aOR 3.1; 95% CI [2.5 – 3.7]) than at 39 to 40 weeks (The Consortium on Safe Labor, 2010).

The average cost of birth hospitalization for ETIs has not been established. However, the hospitalization cost for 37 week infants was higher ($1,545, SD $\pm$ $4,291, $p < 0.001$) when compared with 39 week infant hospitalization ($1,258, SD $\pm$ $4,429) costs (McIntire & Leveno, 2008). Additionally, Clark et al. (2009) discovered that 17.8% of early term infants delivered electively without medical indication required admission

into a special care nursery for an average of 4.5 days. The cost of early educational intervention (EI) by gestational age has been examined, and the cost for this service should be considered in the long term cost of prematurity (Clements et al., 2007). By age three, the cost of EI for infants born at 27 to 40 weeks gestation was higher when gestational age decreased. The mean cost for EI for children born at 37 to 38 weeks was $4671 and $5113 respectively while mean cost for EI for children born at 39 and 40 weeks was $4409 and $4207 (Clements et al.).

Tita et al. (2010) examined neonatal outcomes for term infants delivered by elective repeat cesarean delivery based upon completed week of gestation. They reported that prolonged hospitalization (5 days or more) was increased at 37 weeks (OR= 2.7, CI [2.0-3.5]) and at 38 weeks (OR= 1.8, CI [1.5-2.2]). Shapiro-Mendoza et al. (2008) examined newborn morbidity including infant hospital stay greater than 5 nights with life threatening diagnostic morbidity and found that morbidity rates nearly doubled for each additional gestational week before 38 weeks. ETIs born at 37 weeks were found to have a higher incidence ($p < .001$) of hospital days (5 days or more) when compared to the 39 week infant referent group (McIntire & Leveno, 2008).

Early term infants are at significantly increased risk for developing feeding problems, among other transition-to-extrauterine life issues (Main et al., 2010). This may be due to poor synchronization of sucking-swallowing and rooting reflexes that are not fully developed until 36-38 weeks gestation (Blackburn, 2007). According to the Academy of Breast Feeding Medicine (2011), infants born at 37 weeks may be at risk for developing breastfeeding problems and standards such as those established in

breastfeeding the Late Preterm Infant Guidelines may be beneficial. It is known that late preterm infants are at greater risk for poor breastfeeding establishment compared to term infants, and breastfeeding complications are a leading health concern for the late preterm infant population (Radtke, 2011). Breastfeeding success rates among physiologically immature, early term infants have not been fully explored, although younger term gestations and breastfeeding are significantly related to increased hospital admission rates (Radtke). A negative association between day three weight loss and gestational age was attributed to the differences if feeding capabilities (sucking and swallowing) of the less mature term infants born at 37 to 38 weeks (Regnault, et al., 2010). In addition, ETI were more likely to require treatment for hypoglycemia (37 weeks OR 3.3, CI [1.9-5.7]; 38 weeks OR 1.3, [CI 0.8-2.0]) when compared to infants born at 39 and 40 weeks (Tita et al., 2009). These finding indicate that early term infants may be less capable of sustaining breastfeeding in a manner that meets their physiologic needs.

Objectives

The purpose of this study was to determine if care practices (NICU admission, length of stay, breastfeeding initiation and duration) experienced by ETIs and FTIs differ. In accordance with newly proposed professional guidelines, the ETI was defined as a live-born infant delivered within a gestational age range of 37 to 38 completed weeks and the FTI was defined as a live-born infant delivered within a gestational age range of 39^{7} to 41 completed weeks (Engle & Kominiarik, 2008; Fleischman et al.; 2010; Reddy et al., 2011). The following infant care experiences were assessed: admission into the NICU,

length of birth hospitalization stay, breastfeeding initiation and breastfeeding duration, and maternal reasons for breastfeeding non-initiation in the early postpartum period

Research Hypotheses

1. There is a difference in NICU admission between early term infants and full term infants.
2. There is a difference in length of birth hospitalization stay between early term infants and full term infants.
3. There is a difference in initiation of breastfeeding between early term infants and full term infants.
4. There is a difference in reasons for maternal non-initiation of breastfeeding between early term and full term infants.
5. There is a difference in duration of breastfeeding between early term infants and full term infants.
6. There is a difference in length of hospital stay in early term infants when examined by gestational age in weeks (37, 38, 39, 40, and 41).
7. There is a difference in duration of breastfeeding in early term infants when examined by gestational age in weeks (37, 38, 39, 40, and 41), race, maternal age, maternal educational level, maternal health, marital status, and NICU admission.

Methods

Design

A descriptive, retrospective study was conducted to compare differences in infant care experiences for the immediate postpartum period for early term and full term infants.

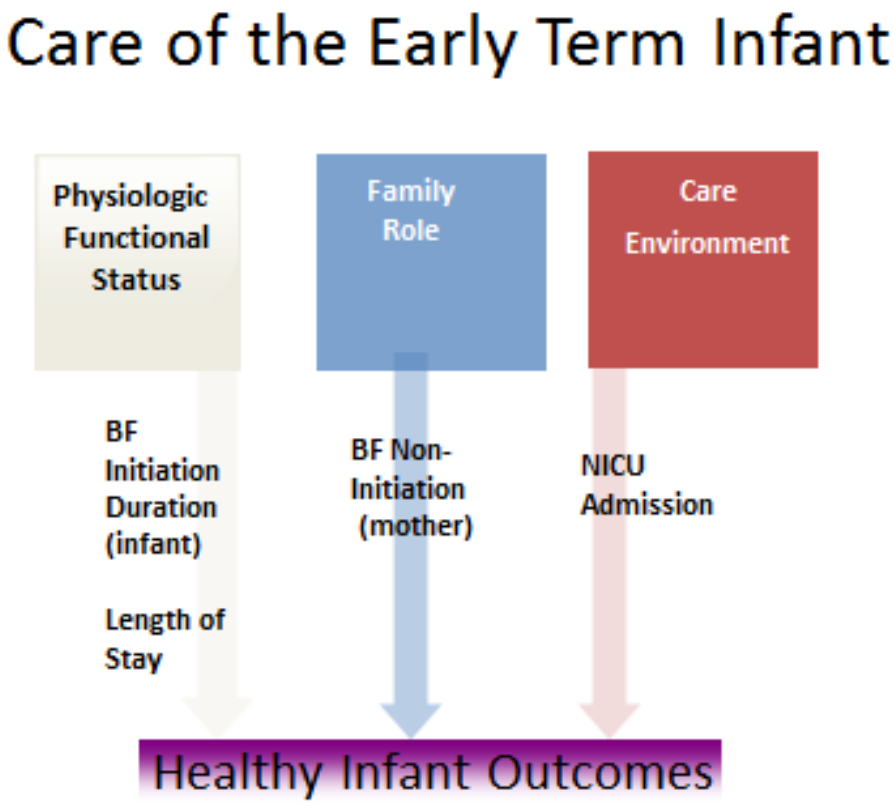
Conceptual Model

The conceptual model for Care of the Late Preterm Term Infant (LPI) was used as a framework to examine care needs for the ETI. The model was developed to guide care practices and optimize health in late preterm infants (34 to 36 completed weeks) and was derived using evidence-based care guidelines for term infants. (Medoff-Cooper, Bakewell-Sachs, Buus-Frank & Santo-Donato, 2005). To the author's knowledge, this was the first time the model was used to compare ETI and FTI care. It consists of four integrated concepts considered essential to achieve positive health outcomes in vulnerable LPIs. The concepts are physiologic functional status, family role (in the hospital and following discharge), care environment, and nursing care practices. Physiologic functional status relates to the physical and functional well-being, and is influenced by factors such as gestational age, maternal-fetal health and history, timing and method of delivery, transition to extrauterine life, and location and quality of care. Family role relates in part to the extent of family involvement in the care of the infant in the hospital and after discharge. Care environment refers to the location of neonatal care, and includes the economic impact of care provided. It includes the NICU and the Newborn Nursery (NBN) environments, and the attitudes among nurses who care for

newborn infants. Nursing care practices involve the nature and quality of nursing care, and include evidence-based care protocols and assessment guidelines. Healthy outcome is defined as infant stability at discharge at the most appropriate time (Medoff-Cooper et al.). The model's components may guide the discovery of specific vulnerabilities shared by all physiologically immature infants and lead to the development of evidence-based care practices specific to the ETI.

The study sought to determine if the conceptual model for LPI Care is appropriate to evaluate care practices in the early postpartum period for the ETI and distinguish care needs that may be different than those for the TI (Figure 1). Variables related to the care environment, physiologic functioning, and family role components of the model were assessed. The ETI physiologic functioning status was assessed by the length of hospital stay (days), since physiologic stability is a criterion for infant discharge (American Academy of Pediatrics, 2010) and by the ability of the infant to initiate and sustain breastfeeding during the early postpartum period. Care environment was measured by comparing the level of hospital care support (NICU versus normal newborn care) required to meet the infant's care needs. Since breastfeeding is a complex reciprocal activity that occurs between a mother and her infant (Radtke, 2011), it was also explored in relation to the model's family role (maternal) component, and measured by causes for maternal non-initiation of breastfeeding.

Figure 1. Care of the Early Term Infant



Setting

The study took place utilizing secondary data collected from mothers of ETI and FTI who were born in Louisiana in 2004.

Population

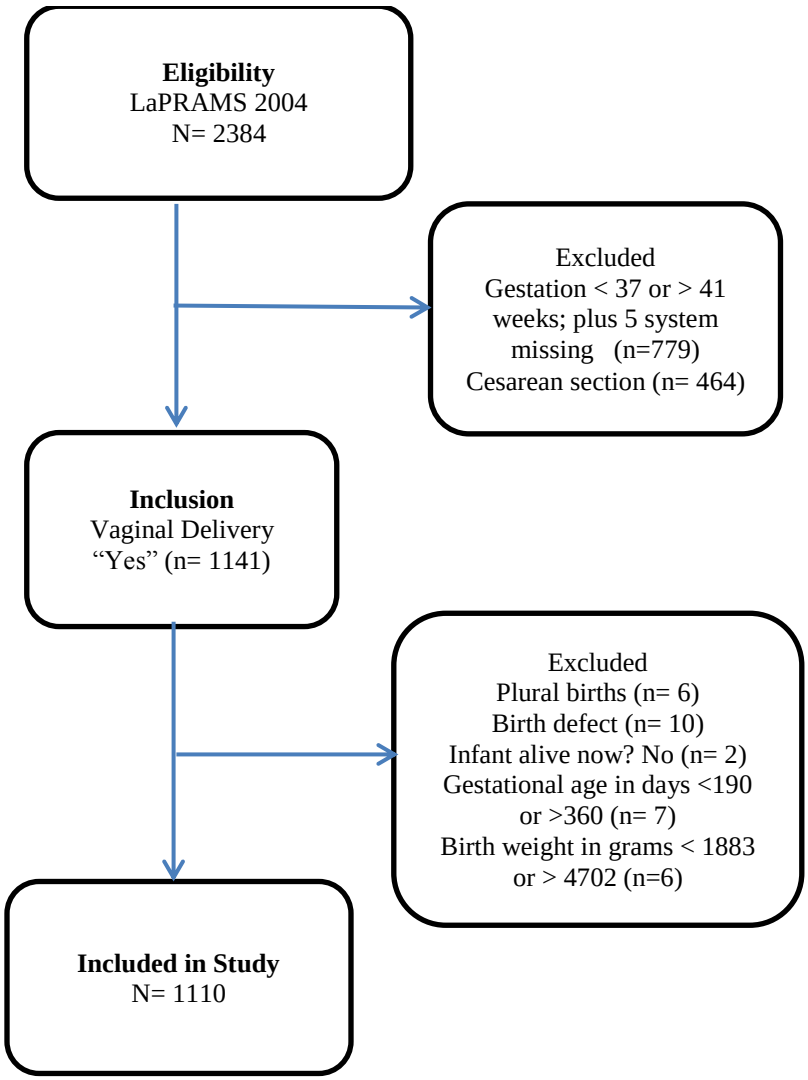
The target population was all Louisiana live-born early term and term infants delivered vaginally from January 1, 2004 to December 31, 2004. Due to Hurricane Katrina, this data was not collected for 2005 and 2006, and had a low response rate (<

55%) for 2007 and 2008. All live-born Louisiana infants are potential candidates for inclusion in Louisiana's Pregnancy Risk Assessment Monitoring System (LaPRAMS) data set. Infants whose mothers completed the LaPRAMS questionnaire for 2004 were the accessible population for sampling purposes.

Participants

A total of 1,110 full term infants (ETI N= 425 and FTI N= 685) as identified by gestational age in weeks were included in the study (Figure 2). Gestational age in weeks was derived from the birth certificate is calculated from date of last menstrual period (LMP) and date of birth (Centers for Disease Control & Prevention National Center for Health Statistics [NCHS], 2010). If this information (date of LMP) was lacking, the clinical or obstetrical assessment of gestational age as recorded on the birth certificate is used (NCHS). The gestational age in weeks documented in the LaPRAMS dataset was used as the initial inclusion criteria. Infants born less than 37 weeks or greater than 41 weeks, or those delivered by cesarean section were then excluded from the study. Once the inclusion criteria of vaginal delivery was met, plural births, infants with documented congenital anomalies, infants no longer living and cases inconsistent with term infant gestation including gestation in days (< 190 or > 360; n = 7) and birth weight in grams <1883 or > 4702; n = 6) were also omitted from the study sample.

Figure 2. Study Sample Flow Chart



Variables

The research variables included in the study were:

Early Term: Live-born singleton infant, delivered vaginally, with a documented gestational age of 37 to 38 completed weeks, without congenital anomaly.

Full Term Infant: Live-born singleton infant, delivered vaginally, with a documented gestational age of 39 to 41 completed weeks, without congenital anomaly.

NICU admission: Admission into a NICU unit after delivery (yes, no).

Length of stay: Number of days spent in hospital after delivery (less than 1 day or 2 days, or 3 to 6 days).

Breastfeeding Initiation: Breast milk taken from breast or bottle (expressed) ever (yes, no).

Breastfeeding Duration: Length of time breast milk taken from breast or bottle (expressed) for any length of time (less than 4 weeks, greater than 4 weeks).

Maternal reason for cessation of breastfeeding: circumstances (didn't like breastfeeding, mom too sick/on meds), and/or household (other children to care for, household duties).

Regression covariates: hospital stay (less that 1 day or 2 days, 3 days, 4 to 6 days or more), gestational age groups (37 or 38 weeks, 39 weeks, 40 or 41 weeks), NICU admission (yes/no), married (yes/other), maternal age (13-19, 20-24, 25-34, 35-45), maternal race (Black, White), maternal education (0-11 years, 12 years, 13-16 plus years), Medicaid before pregnancy (yes/no), maternal health (mom smokes now? yes; no medical risk factors? no).

Instrument

Secondary analysis of existing data in the 2004 Louisiana Pregnancy Risk Assessment Monitoring System (LaPRAMS) dataset (Appendix B), collected and maintained by the Louisiana Office of Public Health (LOPH), was performed (LaPRAMS, 2010). Stratified systematic sampling predetermined by LOPH based upon infant birth weight (< 1500 grams and > 1500 grams) and geographic residence location (rural and non-rural) was used to compile this dataset. The LaPRAMS survey (2000 to 2004) included from 1, 651 to 2,384 participants annually, had a 70% to 75% response rate, and an average infant age upon survey completion of 127.6 days (Tong, Jones, Dietz, D'Angelo, & Bombard, 2009). LaPRAMS data was not collected in 2005 and 2006 and questionnaire bias was controlled by not utilizing data for 2007 and 2008 which had a low response rate (< 55%).

The PRAMS is part of the Centers for Disease Control and Prevention initiative to reduce infant mortality and low birth weight (CDC, 2010). It is a state specific and population based surveillance system that identifies and monitors maternal experiences/behaviors in the prenatal, intrapartum and post-partum period. Currently, 37 states participate in PRAMS data monitoring. PRAMS uses each states' vital statistics (birth certificates) as its population based sample and "follows back" a stratified sample of women several months into the post-partum period (Kotelchuck, 2006). The questionnaire has a core component (used by all states) and a state specific component aimed at addressing a particular state's data needs. Core components include: cigarette smoking and alcohol use, interconceptional care, barriers to care, Medicaid and WIC

participation, folic acid awareness, pregnancy intention, prenatal care, HIV counseling, infant sleep position, physical abuse, depression, breast feeding, infant health and care and insurance coverage (National Healthy Start, 2010). The PRAMS dataset may be used to "improve the continuity of maternal and infant health from pregnancy through the early postpartum period…provide a conduit for community "voice" and involvement in research…(and) serve as a site for maternal child health methodological research" (Kotelchuck, p. 7). The PRAMS has been used to collect data on exclusive breastfeeding and uses the World Health Organization's "exclusive" definition which is useful in measuring feeding mode and not the content of the feeding (Thulier, 2010).

All public health departments participating in the PRAMS survey use a standardized sampling methodology developed by the CDC Sites (states) participating in PRAMS select a sample of 100 to 300 new mothers each month utilizing stratified systematic sampling from recent birth certificates. Staff members from LaPRAMS mail a self-administered questionnaire to selected women 2 to 3 months post-delivery of a live-born infant. Women who do not respond to 3 serial mailings are contacted by telephone in order to complete the survey per interview. Recall bias is minimized by making no effort to contact women after 9 months postpartum. Survey data are linked to specific birth certificate data and weighted for sample design (infant birth weight and geographic location). Survey analyses were conducted using IBM SPSS 20 (IBM, 2012) in order to account for the complex weighted survey design of the PRAMS (Tong et al., 2009).

Protection of Human Subjects

Institutional Review Board approval was obtained from The University of Texas at Tyler (Appendix C). Permission to secure LaPRAMS data was obtained from the LA Office of Public Health (Appendix D). LaPRAMS data related to demographic and study variables were examined by the researcher.

Data Collection Procedures

Data Management

Data were received by mail on computer disk, and cases that did not meet inclusion/exclusion criteria were deleted. Data analysis was conducted utilizing IBM Statistics 20 software. Confidentiality was maintained through securing the LaPRAMS disk in a locked file cabinet when not in use, using computer password security for data analysis, and reporting data in aggregate form. No information was shared beyond the investigator and the research team conducting the data analysis.

Data Analysis

The following complex samples statistical analysis was used for each research hypothesis:

1. There is a difference in the NICU admission (yes, no) between early term infants and full term infants. Dichotomous nominal data, 2 independent groups, preset alpha .05, Chi-square test of independence.
2. There is a difference in length of stay (less than 2 days, or 3 to 6 days) between early term infants and full term infants when examined by gestational ages in

weeks (37 or 38 weeks, 39 weeks, 40 or 41 weeks). Categorical data, 2 independent groups, preset alpha .05, Chi-square test of independence.

3. There is a difference in the initiation of breastfeeding (yes, no) between the early term infants and full term infants. Dichotomous nominal data, 2 independent groups, preset alpha .05, Chi-square test of independence.

4. There is a difference in cause for maternal non-initiation of breastfeeding between early term infants and full term infants (circumstances, household duties) [Ahluwalia, Morrow & Hsia, 2005]. Dichotomous nominal data, 2 independent groups, preset alpha .05, Chi-square test of independence.

5. There is a difference in duration of breastfeeding (less than 4 weeks, greater than 4 weeks) between early term infants and full term infants. Ordinal data, 2 independent groups, preset alpha .05, Chi-square test of independence.
6. There is a difference in length of hospital stay (less than 2 days, 3 days, or 4 or more days) in infants when examined by gestational ages in weeks (37 or 38 weeks, 39 weeks, 40 or 41 weeks). Categorical data, more than 2 groups, preset alpha .017, ordinal logistic regression.
7. There is a difference in duration of breastfeeding (less than 1 week, greater than 4 weeks) in infants when examined by gestational age in groups (37 or 38; 39; 40 or 41), race (Black or White), maternal education level (< high school; high school; 13 – 16 years or more), marital status (yes, other) [Hill, Aldag, Chatterton & Zinaman, 2005), maternal age (< 19; 20-24; 25-34; 35 or >), maternal health (smoking after delivery or medical risk factors) [Ahluwalia et al., 2005], and

NICU admission (yes, no) [Colaizy & Morriss, 2008]. Categorical data, more than 2 groups, preset alpha .05, binomial logistic regression.

Results

Demographic data collected from LaPRAMS (2004) are presented (Table 1).

Table 1. 2004 Non-Weighted Sample Demographic Data

Sample (N= 1110)	Early Term (n= 425)	Term (n= 685)
	N (%)	N (%)
Gender (male)	228 (53.64)	339 (49.48)
Race:		
White	258 (60.7)	407 (59.41)
Black	159 (37.41)	254 (37.08)
Maternal Age:		
13-19	62 (14.58)	94 (13.72)
20-24	153 (36)	232 (33.68)
25-34	181 (42.58)	302 (44.08)
35-45	29 (6.82)	57 (13.41)
Maternal Education[a]:		
0-11 years	94 (22.11)	124 (18.10)
12 years	166 (39.05)	234 (34.16)
13-16 years plus[a]	165 (38.82)	327 (47.73)
Married	217(51.05)	377(55.03)
Medicaid Before Pregnancy	44(10.35)	51(7.44)

a: $p = .034$; all other categories $p > .05$

ETI were 53.64% male, born to mothers with a mean age in years of 25.43 (*SD* 5.55), with a high school education or more (77.87%). FTI were 49.48% male, born to mothers with a mean age in years of 25.69 (*SD* 5.76) with a high school level of education or more (81.89%).

The examination of hypothesis three breastfeeding ever (yes, no) between ETIs and FTIs approached significance between infant groups (X^2 = 3.04, *df* = 1, *p* = .086), with ETIs (36.4%) being less likely to ever breastfeed (BF). Hypothesis four examined maternal reasons for non-initiation of breastfeeding and results were marginally significant (X^2 = 3.53, *df*= 1, *p*= .061) between infant groups. ETI moms (67.6%) chose specific reasons (mom too sick/on meds or mom didn't like) for BF non-initiation compared with FTI moms (57.5%). Household responsibilities for maternal non-initiation of breastfeeding were similar between infant groups (Table 2).

Table 2. Hypothesis 2: Breastfeeding Ever and Hypothesis 4: Maternal Reasons for Non-Initiation of Breastfeeding by Infant Group

	Early Term % (CI)	Full Term % (CI)	X^2
Breastfeeding Ever (n = 746)	36.4 (32-41)	63.6 (59-68)	3.04 (*p* = .086)
Breastfeeding Non-Initiation (n = 332)			
A. Mom too sick, Didn't Like	67.6 (59.5-74.9)	57.5 (50.3-64.3)	3.53 (*p*= .061)
B. Household duties, other children to care for	26.9 (20-35.1)	35.4 (28.8-42.6)	2.69 (*p* = .109)

Hypothesis one difference in NICU admission (yes, no) and hypothesis two length of stay (less than 2 days and 3 days or more) were compared between infant groups. Both NICU admission (X^2= .309, *df* =1, *p* = 0.591) and length of stay [LOS] (X^2 = .985, *df* = 1, *p* = 0.329) detected no differences between groups. Hypothesis five resulted in no significant difference in breastfeeding duration (less than 4 weeks or greater than 4 weeks) between infant groups (X^2= 1.97, *df*=1, *p*= 0.169). Hypothesis six provided further examination of length of stay (less than 2 days, 3 days, or 4 days or more) between infant groups (37 or 38 weeks; 39 weeks; 40 or 41 weeks) yielded non-significant results (Adj. *F* = 3.067, *df* (1, 767), *p*= 0.080).

Hypothesis seven utilized binomial logistic regression to predict duration of breastfeeding (less than 4 weeks, greater than 4 weeks). Using backward elimination, variables were retained in the model if the alpha level was less than 0.1 (Table 3).

Table 3. Hypothesis 7: Predictors of Breastfeeding Less Than Four Weeks

Predictor (N = 738)	Odds Ratio	95% CI
Maternal Race: Black	2.08*	(1.39, 3.11)
High School Education	2.87*	(1.99, 4.14)
Unmarried/Other	1.76[a]	(1.18, 2.69)
Smoking Now/Other Health Risks	1.78[b]	(1.25, 2.53)

*****p = .000; a: p = .006; b: p = .001

Significant predictors of short breastfeeding (less than 4 weeks) included Black race ($p < 0.001$), less maternal education ($p < 0.001$), unmarried status ($p = 0.006$) and poor maternal health ($p = 0.001$).

Findings

Hospital utilization and breastfeeding practices did not differ significantly between ETI and FTI in this study. The fact that ETI were not admitted to the NICU more often than FTI as reflected in previous research may be related to the low number of NICU admission (n= 39) contained in this sample. No significant difference in length of stay between infant groups was found which indicates that physiologic functioning after vaginal birth was similar between groups. The marginally significant differences in breastfeeding ever and in maternal circumstances for non-initiation of breastfeeding (mom too sick/on meds or didn't like BF) should be explored in future research. When compared with household reasons for maternal non-initiation of BF (children to care for and household duties), it appears that moms of ET and FT infants have some similar responsibilities that influenced their choice not to breastfeed. The predictors for breastfeeding less than 4 weeks (Black race, high school education or less, unmarried/other, maternal smoking/health risk factors) are consistent with known breastfeeding barriers and were not significantly related to early term gestation. Demographic characteristics of the sample were similar with the exception of the FTI maternal education category being significantly higher for 13 to 16 or more years ($p = .034$).

Conclusions

New knowledge gained from the examination of early term infant care experiences fills a knowledge gap related to planning care and allocating health care dollars for this vulnerable infant population. Study findings have particular importance for Louisiana since it is the first state in the nation to have all birthing hospitals pledge to improve infant health by accepting the March of Dimes challenge to eliminate the practice of delivering babies before 39 weeks (DHH, 2011). By documenting ETI care practices in the early postpartum period, evaluation of need and direction of health care funds can be appropriated more efficiently. Study limitations include threats to validity due to the questionable quality of some portions of birth certificate data used to determine infant gestational age (LMP and clinical assessment variations) [Qin, Hsia, & Berg, 2008] and poor documentation of congenital anomalies in the birth record (Northam & Knapp, 2006). In addition, the PRAMS is a self-administered, mailed and confidential questionnaire and is subject to recall bias, social desirability bias (Tong et al., 2009) and measurement bias due to wording and questionnaire design (Hosler, Nayak & Radigam, 2010). However, convergent validity of gestational diabetes mellitus data between the PRAMS and birth certificate has been documented (Hosler et al). Pregnancy morbidity data agreement between PRAMS and hospital discharge data was higher than agreement between PRAMS and birth certificate data and therefore linkage of PRAMS with hospital discharge data provides information about the reliability of PRAMS self-reported data (Lu et al., 2010). Additionally, the fact that a larger proportion of FTI mothers had higher education levels (beyond high school) could have positively impacted their infant's

health due to potentially greater access to health care, increased knowledge about health matters and disease prevention orientation.

Further descriptive research utilizing PRAMS data and guided by AWHONN's Conceptual Model for Optimizing Late Preterm Birth Outcomes (Medoff-Cooper et al., 2005) is recommended. The conceptual model was adequate for guiding research examining vulnerable infant care although no significant differences in care experienced was detected in the study population. Further study testing the model on a national sample may prove beneficial for identifying differences in physiologic functioning status, level of care required and the importance of family caregiver role to guide further research with this population. Future studies may also explore written comments regarding reasons for breastfeeding non-initiation for ETI and including cesarean births in the sample. Study implications include the continued need to encourage and support breastfeeding initiation in younger, less educated, Black mothers of all term infants, regardless of term gestational age. Ultimately, this knowledge may be used to establish evidence based practice guidelines similar to those already in place for the late preterm infant.

Maternal report of early term infant care experiences represents a new vantage point for research in this vulnerable term infant subpopulation. Knowledge of care practices within the hospital setting and after discharge may provide valuable insight into support for breastfeeding mothers who either are too sick or perceive themselves to be unable to breastfeed their ETI . How early term infants fare after birth and in the immediate postpartum period is documented in the PRAMS dataset. Analysis of this

information will benefit the public at both the state and national level. Research that utilizes PRAMS data may be useful in identifying associations between gestational age and infant care needs in this new term birth subcategory. ETI and their families stand to benefit from knowledge gained related to providing optimum care and identifying appropriate interventions to decrease negative short-term and long-term outcomes in this population.

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Chapter 4: Summary and Conclusions

The purpose of this research project was to examine the existing research documenting the immediate and long term health outcomes for the early term infant (ETI) due to its recent identification as a unique and vulnerable term infant subcategory. Since it has been determined that infants born on the earlier side of term is a rapidly increasing gestational age category (Davidoff et al., 2006), the author initially examined the recognized ETI vulnerabilities and subsequently elected to examine care practices in the early postpartum period for ETIs born in Louisiana.

Evaluation of the Project

The findings from existing research demonstrate that ETI (37 to 38 weeks) have higher morbidity and mortality risks than full term infants (FTI) born at 39 to 41 weeks gestation. The increase in mortality rate for ETIs occurred most often in the neonatal and infancy periods, and was higher than deaths that occurred in infants born at 39 weeks and beyond. The increase in morbidity included respiratory diseases, increased need for acute care (NICU, special care nursery), prolonged length of stay for birth hospitalization, and higher rates of re-hospitalization for dehydration. Calling attention to research documenting ETI vulnerabilities and dissemination of this knowledge to clinical nurses currently caring for these infants was the intended purpose of manuscript one.

Manuscript two contains the findings from a descriptive, retrospective study performed with ETI born in Louisiana in 2004. Data from 2004 was utilized due to availability and adequacy of response rate. Results demonstrated a minimally significant

difference in breastfeeding initiation (p = 0.086) and reasons mothers gave for non-initiation of breastfeeding (p= 0.06) when compared between ETI and FTI groups. Differences in breastfeeding initiation may indicate that ETI are more likely to not be breastfed when compared to their FTI counterparts. This could occur for numerous reasons, yet mothers of ETI were more likely to answer that they did not initiate breastfeeding their infant because they were sick or on medications, or did not like breastfeeding.

Recommendations Based on the Findings

Further studies should be conducted examining care practices for the ETI using the Pregnancy Risk Assessment Monitoring System (PRAMS) dataset. This dataset contains numerous items pertaining to breastfeeding which is a known practice to improve infant health and should continue to be explored to target care areas which could positively impact ETI health outcomes. In addition, infant safely practices such as safe sleep, car seat use, caregiver type, and infant exposure to secondhand smoke which impact infant mortality are all documented in PRAMS. This information may also be used to optimize ETI health and guide the direction of limited health care resources.

The Conceptual Model for Optimizing Late Preterm Infant Outcomes (Medoff-Cooper, Bakewell-Sachs, Buus-Frank, & Santa-Donato, 2005) was useful for guidance in the examination of major components of vulnerable infant care that affect healthy outcomes. Three of the model's components (physiologic functioning status, family role and care environment) were assessed for significant differences in care (ETI versus FTI). Although no significant differences were identified using this model, the author

recommends testing this model utilizing gestational age in days to address the design weakness of lack of reliable separation of the ETI and FTI categories. This should be done in order to measure gestational age as a continuous variable and to deal with the drawback of using last menstrual period (LMP) as the basis of deriving gestational age categories. Future studies should be conducted on a national sample using more current PRAMS data (with a > 65% response rate) and include cesarean deliveries which may account for approximately 30% of deliveries.

Conclusions

The Department of Health and Hospitals in Louisiana is the first state to accept the March of Dimes challenge to eliminate the practice of delivering babies before 39 weeks (DHH, 2011). Every birthing hospital (58) in Louisiana has agreed to end this practice which is projected to save infant lives and health care dollars and the Louisiana Birth Outcomes Initiative has been established to address problems related to infant mortality and morbidity. Yet the issue of infants being born early term whether due to convenience or medical necessity continues. By beginning to compare ETI care with full term infant (FTI) care, clinicians may determine if their care needs differ in the early postpartum period and in what ways. Ultimately, this knowledge can be used to establish evidence based practice guidelines similar to those already in place for the late preterm infant. This research begins to explore care practices, especially those related to breastfeeding and reasons for maternal non-initiation of breastfeeding which fills a gap in knowledge concerning ETI care.

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Appendix A: Written Permission to Include Published Manuscript

AWHONN
Association of Women's Health, Obstetric and Neonatal Nurses

Promoting the health of women and newborns.

March 21, 2012

Dr. Sally Northam PhD, RN
Office of Graduate Studies
University of Texas at Tyler
Tyler, TX

Dear Dr. Sally Northam,

I am writing on behalf of graduate student Debra Craighead to confirm for your office the following:

1. Debra Caighead has submitted and we have published in AWHONN's clinical journal, Nursing for Women's Health, the article entitled, Early Term Birth Understanding the Health Risks to Infants

2. Debra Craighead has the express permission of the Association of Women's Health, Obstetric & Neonatal Nurses to include the article in her Dissertation at the University of Texas at Tyler

3. As copyright holder of said article, AWHONN agrees that should the University want to provide said article for dissemination, permission would be granted and AWHONN requests that, as possible, the accepted version of the article is the one that is circulated within the Dissertation.

If I can be of any further assistance, please do not hesitate to contact me at the number or email provided herein.

Best to you today,

Carolyn Cockey

Carolyn Davis Cockey, MLS
AWHONN Director of Publications

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Appendix B: Pregnancy Risk Assessment Monitoring System (PRAMS)

Phase 5 Core Questionnaire

First, we would like to ask a few questions about you and the time before you got pregnant with your new baby. Please check the box next to your answer.

1. *Just before* you got pregnant, did you have health insurance? Do not count Medicaid.

No

Yes

2. *Just before* you got pregnant, were you on Medicaid?

No

Yes

3. During the *month before* you got pregnant with your new baby, how many times a week did you take a multivitamin or a prenatal vitamin? These are pills that contain many different vitamins and minerals.

I didn't take a multivitamin or a prenatal vitamin at all

1 to 3 times a week

4 to 6 times a week

Every day of the week

4. What is *your* date of birth?

[BOX] [BOX] 19[BOX]

Month Day Year

5. *Just before* you got pregnant with your new baby, how much did you weigh?

[BOX] Pounds OR [BOX] Kilos

6. How tall are you without shoes?

[BOX] Feet [BOX] Inches

OR [BOX] Centimeters

7. Before you got pregnant with your new baby, did you talk with a doctor, nurse, or other health care worker to prepare for a healthy pregnancy?

[BOX] No [Box] Yes

8. *Before* you got pregnant with your new baby, did you ever have any other babies who were born alive?

No □ Go to Question 11

Yes

9. Did the baby born *just before* your new one weigh 5 pounds, 8 ounces (2.5 kilos) *or less* at birth?

No

Yes

10. Was the baby *just before* your new one born *more* than 3 weeks before its due date?

No

Yes

11. How old were you when you got pregnant with your first baby?

_____Years old

The next questions are about the time when you got pregnant with your *new* baby.

12. Thinking back to *just before* you got pregnant with your *new* baby, how did you feel about becoming pregnant? Check <u>one</u> answer

I wanted to be pregnant sooner

I wanted to be pregnant later

I wanted to be pregnant then

I didn't want to be pregnant then or at any time in the future

13. When you got pregnant with your new baby, were you trying to get pregnant?

No

Yes Go to Question 16

14. When you got pregnant with your new baby, were you or your husband or partner doing anything to keep from getting pregnant? (Some things people do to keep from getting pregnant include not having sex at certain times [rhythm] or withdrawal, and using birth control methods such as the pill, condoms, cervical ring, IUD, having their tubes tied, or their partner having a vasectomy.)

No

Yes Go to Question 16

15. What were your or your husband's or partner's reasons for not doing anything to keep from getting pregnant? Check <u>all</u> that apply

I didn't mind if I got pregnant

I thought I could not get pregnant at that time

I had side effects from the birth control method I was using

I had problems getting birth control when I needed it

I thought my husband or partner or I was sterile (could not get pregnant at all)

My husband or partner didn't want to use anything

Other Please tell us:

[BOX]

The next questions are about the prenatal care you received during your most recent pregnancy. Prenatal care includes visits to a doctor, nurse, or other health care worker before your baby was born to get checkups and advice about pregnancy. (It may help to look at the calendar when you answer these questions.)

16. How many weeks or months pregnant were you when you were *sure* you were pregnant? (For example, you had a pregnancy test or a doctor or nurse said you were pregnant.)

[BOX] Weeks OR [BOX] Months

I don't remember

17. How many weeks or months pregnant were you when you had your first visit for prenatal care? Do not count a visit that was only for a pregnancy test or only for WIC (the Special Supplemental Nutrition Program for Women, Infants, and Children).

[BOX] Weeks OR [BOX] Months

I didn't go for prenatal care

18. Did you get prenatal care as early in your pregnancy as you wanted?

No

Yes

I didn't want prenatal care Go to Question 20

19. Here is a list of problems some women can have getting prenatal care. For each item, circle Y (Yes) if it was a problem for you during your most recent pregnancy or circle N (No) if it was not a problem or did not apply to you.

a. I couldn't get an appointment when I wanted one .....N
.....Y

b. I didn't have enough money or insurance to pay for my visits.....N
.....Y

c. I had no way to get to the clinic or doctor's office .....N
.....Y

d. I couldn't take time off from work .....N
.....Y

e. The doctor or my health plan would not start care as early as I wanted.....N
.....Y

f. I didn't have my Medicaid card .....N
.....Y

g. I had no one to take care of my children.....N
.....Y

h. I had too many other things going on .....N
.....Y

i. I didn't want anyone to know I was pregnant.....N
.....Y

j. Other .....N
.....Y

Please tell us:
[BOX]

If you did not go for prenatal care, go to Page 4, Question 25.

20. Where did you go most of the time for your prenatal visits? Do not include visits for WIC. Check one answer

Health clinic

Health department clinic

Private doctor's office or HMO clinic

Other, please tell us:

21. How was your prenatal care paid for? Check all that apply

Medicaid

Personal income (cash, check, or credit card)

Health insurance or HMO (including insurance from your work or your husband's work)

Other Please tell us:

22. During any of your prenatal care visits, did a doctor, nurse, or other health care worker talk with you about any of the things listed below? Please count only discussions, not reading materials or videos. For each item, circle Y (Yes) if someone talked with you about it or circle N (No) if no one talked with you about it.

a. How smoking during pregnancy could affect my baby .....N
.....Y

b. Breastfeeding my baby .....N
.....Y

c. How drinking alcohol during pregnancy could affect my baby .....N
.....Y

d. Using a seat belt during my pregnancy.....N
.....Y

e. Birth control methods to use after my pregnancy.....N
.....Y

f. Medicines that are safe to take during my pregnancy.....N
.....Y

g. How using illegal drugs could affect my baby .....N
.....Y

h. Doing tests to screen for birth defects or diseases that run in my family .....N
.....Y

i. What to do if my labor starts early.....N
.....Y

j. Getting tested for HIV (the virus that causes AIDS) .....N
.....Y

k. Physical abuse to women by their husbands or partners.....N
.....Y

23. During any of your prenatal care visits, did a doctor, nurse, or other health care worker talk with you about how much weight you should gain during your pregnancy?

[BOX] No

[BOX] Yes

24. During any of your prenatal care visits, did a doctor, nurse, or other health care worker ask if you were smoking cigarettes?

[BOX] No

[BOX] Yes

25. At any time during your most recent pregnancy or delivery, did you have a test for HIV (the virus that causes AIDS)?

No

Yes

I don't know

26. Have you ever heard or read that taking the vitamin folic acid can help prevent some birth defects?

[BOX] No Go to question 28

[BOX] Yes

27. Have you ever heard about folic acid from any of the following? Check all that apply

Magazine or newspaper article

Radio or television

Doctor, nurse, or other health care worker

Book

Family or friends

Other, Please tell us

The next questions are about your most recent pregnancy and things that might have happened during your pregnancy.

28. During your most recent pregnancy, were you on WIC (the Special Supplemental Nutrition Program for Women, Infants, and Children)? No/Yes

29. Did you have any of these problems during your most recent pregnancy? For each item, circle Y (Yes) if you had the problem or circle N (No) if you did not.

a. High blood sugar (diabetes) that started *before* this pregnancy N Y

b. High blood sugar (diabetes) that started *during* this pregnancy N Y

c. Vaginal bleeding N Y

d. Kidney or bladder (urinary tract) infection N Y

e. Severe nausea, vomiting, or dehydration N Y

f. Cervix had to be sewn shut (incompetent cervix) N Y

g. High blood pressure, hypertension (including pregnancy-induced hypertension [PIH], preeclampsia, or toxemia) N Y

h. Problems with the placenta (such as abruptio placentae or placenta previa) N Y

i. Labor pains more than 3 weeks before my baby was due (preterm or early labor) N Y

j. Water broke more than 3 weeks before my baby was due (premature rupture of membranes [PROM]) N Y

k. I had to have a blood transfusion N Y

l. I was hurt in a car accident N Y

If you did not have any of these problems, go to Question 31.

30. Did you do any of the following things because of these problems? For each item, circle Y (Yes) if you did that thing or circle N (No) if you did not.

a. I went to the hospital or emergency room and stayed less than 1 day.....N
.....Y

b. I went to the hospital and stayed 1 to 7 days .....N
.....Y

c. I went to the hospital and stayed more than 7 days .....N
.....Y

d. I stayed in bed at home more than 2 days because of my doctor's or nurse's advice
.....N
.....Y

The next questions are about smoking cigarettes and drinking alcohol.

31. Have you smoked at least 100 cigarettes in the *past 2 years*? (A pack has 20 cigarettes.)

No Go to Page 6, Question 35

Yes

32. In the *3 months before* you got pregnant, how many cigarettes did you smoke on an average day? (A pack has 20 cigarettes.)

41 cigarettes or more

21 to 40 cigarettes

11 to 20 cigarettes

6 to 10 cigarettes

1 to 5 cigarettes

Less than 1 cigarette

None (0 cigarettes)

33. In the *last 3 months* of your pregnancy, how many cigarettes did you smoke on an average day? (A pack has 20 cigarettes.)

41 cigarettes or more

21 to 40 cigarettes

11 to 20 cigarettes

6 to 10 cigarettes

1 to 5 cigarettes

Less than 1 cigarette

None (0 cigarettes)

34. How many cigarettes do you smoke on an average day *now*? (A pack has 20 cigarettes.)

41 cigarettes or more

21 to 40 cigarettes

11 to 20 cigarettes

6 to 10 cigarettes

1 to 5 cigarettes

Less than 1 cigarette

None (0 cigarettes)

35. Have you had any alcoholic drinks in the *past 2 years*? (A drink is 1 glass of wine, wine cooler, can or bottle of beer, shot of liquor, or mixed drink.)

No Go to Question 38

Yes

36a. During the *3 months before* you got pregnant, how many alcoholic drinks did you have in an average week?

14 drinks or more a week

7 to 13 drinks a week

4 to 6 drinks a week

1 to 3 drinks a week

Less than 1 drink a week

I didn't drink then

36b. During the *3 months before* you got pregnant, how many times did you drink 5 alcoholic drinks or more in one sitting?

6 or more times

4 to 5 times

2 to 3 times

1 time

I didn’t have 5 drinks or more in 1 sitting

I didn’t drink then

37a. During the *last 3 months* of your pregnancy, how many alcoholic drinks did you have in an average week?

14 drinks or more a week

7 to 13 drinks a week

4 to 6 drinks a week

1 to 3 drinks a week

Less than 1 drink a week

I didn’t drink then

37b. During the *last 3 months* of your pregnancy, how many times did you drink 5 alcoholic drinks or more in one sitting?

6 or more times

4 to 5 times

2 to 3 times

1 time

I didn’t have 5 drinks or more in 1 sitting

I didn't drink then

Pregnancy can be a difficult time for some women. These next questions are about things that may have happened before and during your most recent pregnancy.

38. This question is about things that may have happened during the *12 months before* your new baby was born. For each item, circle Y (Yes) if it happened to you or circle N (No) if it did not. (It may help to use the calendar.)

a.	A close family member was very sick and had to go into the hospital	N	Y
b.	I got separated or divorced from my husband or partner	N	Y
c.	I moved to a new address	N	Y
d.	I was homeless	N	Y
e.	My husband or partner lost his job	N	Y
f.	I lost my job even though I wanted to go on working	N	Y
g.	I argued with my husband or partner more than usual	N	Y
h.	My husband or partner said he didn't want me to be pregnant	N	Y
i.	I had a lot of bills I couldn't pay	N	Y
j.	I was in a physical fight	N	Y
k.	My husband or partner or I went to jail	N	Y
l.	Someone very close to me had a bad problem with drinking or drugs	N	Y
m.	Someone very close to me died	N	Y

The next questions are about the time during the *12 months before* you got pregnant with your new baby.

39a. During the *12 months before* you got pregnant, did an ex-husband or ex-partner push, hit, slap, kick, choke, or physically hurt you in any other way?

No

Yes

39b. During the *12 months before* you got pregnant, were you physically hurt in any way by your husband or partner?

No

Yes

The next questions are about the time during your most recent pregnancy.

40a. During your most recent pregnancy, did an ex-husband or ex-partner push, hit, slap, kick, choke, or physically hurt you in any other way?

No

Yes

40b. During your most recent pregnancy, were you physically hurt in any way by your husband or partner?

No

Yes

The next questions are about your labor and delivery. (It may help to look at the calendar when you answer these questions.)

41. When was your baby due?

[BOX] [BOX] [BOX]

Month Day Year

42. When did you go into the hospital to have your baby?

[BOX] [BOX] [BOX]

Month Day Year

I didn't have my baby in a hospital

43. When was your baby born?

[BOX] [BOX] [BOX]

Month Day Year

44. When were you discharged from the hospital after your baby was born? (It may help to use the calendar.)

[BOX] [BOX] [BOX]

Month Day Year

I didn't have my baby in a hospital

45. How was your delivery paid for? Check all that apply

Medicaid

Personal income (cash, check, or credit card)

Health insurance or HMO (including insurance from your work or your husband's work)

State-specific

State-specific

Other Please tell us:

[BOX]

The next questions are about the time since your new baby was born.

46. After your baby was born, was he or she put in an intensive care unit?

No

Yes

I don't know

47. After your baby was born, how long did he or she stay in the hospital?

Less than 24 hours (less than 1 day)

24 to 48 hours (1 to 2 days)

3 days

4 days

5 days

6 days or more

My baby was not born in a hospital

My baby is still in the hospital Go to Question 43

48. Is your baby alive now?

No Go to Question 51

Yes

49. Is your baby living with you now?

No Go to Question 51

Yes

50. Did you ever breastfeed or pump breast milk to feed your new baby after delivery?

No Go to Question 52

Yes

51. What were your reasons for not breastfeeding your new baby?

Check all that apply:

My baby was sick and could not breastfeed

I was sick and on medicine

I had other children to take care of

I had too many household duties

I didn't like breastfeeding

I didn't want to be tied down

I was embarrassed to breastfeed

I went back to work or school

I wanted my body back to myself

Other: Please tell us

If you did not breastfeed your new baby, go to question 55

52. Are you still breastfeeding or feeding pumped milk to your new baby?

No

Yes Go to Question 46

53. How many weeks or months did you breastfeed or pump milk to feed your baby?

[BOX] Weeks OR [BOX] Months

Less than 1 week

54. How old was your baby the first time you fed him or her anything besides breast milk? Include formula, baby food, juice, cow's milk, water, sugar water, or anything else you fed your baby.

[BOX] Weeks OR [BOX] Months

My baby was less than 1 week old

I have not fed my baby anything besides breast milk

If your baby is still in the hospital, go to Page 10, Question 56.

55. This question asks about things that may have happened at the hospital where your new baby was born. For each item, circle Y (yes) if it happened or circle N (no) if it did not happen

Hospital staff gave me information about breastfeeding

My baby stayed in the room with me in the hospital

I breastfed my baby in the hospital

I breastfed my baby in the first hour after my baby was born

Hospital staff helped me learn how to breastfeed

My baby was fed only breast milk at the hospital

Hospital staff told me to breastfeed whenever my baby wanted

The hospital gave me a gift pack with formula

The hospital gave me a telephone number to call for help with breastfeeding

My baby used a pacifier in the hospital

56. Did anyone suggest that you not breastfeed your new baby?

[BOX] No Go to Question 58

[BOX] Yes

57. Who suggested that you not breastfeed your new baby? Check all that apply:

My husband or partner

My mother, father or in-laws

Other family member or relative

My friends

My baby's doctor, nurse, or other health care worker

Other: Please tell us

If your baby is still in the hospital, go to Question 65

58. About how many hours a day, on average, is your new baby in the same room with someone who is smoking?

[BOX] Hours

Less than 1 hour a day

My baby is never in the same room with someone who is smoking

59. How do you *most often* lay your baby down to sleep now? Check <u>one</u> answer

On his or her side

On his or her back

On his or her stomach

60. How often does your new baby sleep in the same bed with you or anyone else?

Always

Often

Sometimes

Rarely

Never

61. Was your new baby seen by a doctor, nurse, or other health care worker during the first week after he or she left the hospital?

No

Yes

62. Has your new baby had a well-baby checkup? (A well-baby checkup is a regular health visit for your baby usually at 2, 4, or 6 months of age.)

No, Go to Question 65

Yes

63. How many times has your new baby been to see a doctor or nurse for a well-baby checkup? (It may help to use a calendar)

_____ Times

64. Where do you usually take your new baby for well-baby checkups?

Hospital clinic

Health department clinic

Private doctor's office or HMO clinic

Other, Please tell us:

65. Do you have health insurance or Medicaid for your new baby?

No, Go to Question 67

Yes

66. What type of insurance is your new baby covered by?

Medicaid

Private insurance or HMO (including insurance from your work or your husband's work)

Other, Please tell us:

67. Are you or your husband or partner doing anything *now* to keep from getting pregnant? (Some things people do to keep from getting pregnant include not having sex at certain times [rhythm] or withdrawal, and using birth control methods such as the pill, condoms, cervical ring, IUD, having their tubes tied, or their partner having a vasectomy.)

No

Yes Go to Question 69

68. What are your or your husband's or partner's reasons for not doing anything to keep from getting pregnant *now*? Check <u>all</u> that apply

I am not having sex

I want to get pregnant

I don't want to use birth control

My husband or partner doesn't want to use anything

I don't think I can get pregnant (sterile)

I can't pay for birth control

I am pregnant now

Other Please tell us:

[BOX]

If you or your husband or partner are not doing anything to keep from getting pregnant, go to Page 12, Question 70.

69. What kind of birth control are you or your husband or partner using now to keep from getting pregnant? Check all that apply

Tubes tied or closed (female sterilization)\

Vasectomy (male sterilization)

Pill

Condoms

Shots once a month (Lunelle©)

Shots once every 3 months (Depo-Provera©)

Contraceptive patch (OrthoEvra©)

Diaphragm, cervical cap, or sponge

Cervical ring (NuvsRing© or others)

IUD (Including Minera©)

Rhythm method or natural family planning

Withdrawal (pulling out)

Not having sex (abstinence)

Other, Please tell us:

The next few questions are about the time during the *12 months before* your new baby was born.

70. During the *12 months before* your new baby was born, what were the sources of your household's income? Check all that apply

Paycheck or money from a job

Money from family or friends

Money from a business, fees, dividends, or rental income

Aid such as Temporary Assistance for Needy Families (TANF), welfare, WIC, public assistance, general assistance, food stamps, or Supplemental Security Income

Unemployment benefits

Child support or alimony

Social security, workers' compensation, disability, veteran benefits, or pensions

Other □ Please tell us:

71. During the *12 months before* your new baby was born, what was your total household income before taxes? Include your income, your husband's or partner's income, and any other income you may have used. (All information will be kept private and will not affect any services you are now getting.) Check <u>one</u> answer

Less than $10,000

$10,000 to $14,999

$15,000 to $19,999

$20,000 to $24,999

$25,000 to $34,999

$35,000 to $49,999

$50,000 or more

72. During the *12 months before* your new baby was born, how many people, including yourself, depended on this income?

[BOX] People

73. Which of the following statements best describes you during the first 3 months before you got pregnant? Check one answer:

I was trying to get pregnant

I wasn't trying to get pregnant or trying to keep from getting pregnant

I was trying to keep from getting pregnant but was not trying very hard

I was trying hard to keep from getting pregnant

74. Which of the following statements best describes your husband or partner during the 3 months before you got pregnant? Check one answer:

He wanted me to get pregnant

He partly wanted me to get pregnant and partly wanted me not to get pregnant

He didn't care one way or the other whether I got pregnant

He didn't especially want me to get pregnant

He wanted very much for me to get pregnant

75. Before you got pregnant with your new baby, had you ever heard or read about emergency birth control (The morning after pill)? This combination of pills is used to prevent pregnancy up to 3 days after unprotected sex.

No

Yes

76. Listed below are some things about smoking that a doctor, nurse, or other health care worker might have done during any of your prenatal care visits. For each thing, circle yes (yes) if it applied to you during any of your prenatal care visits or circle no (no) if it did not.

No/Yes

Spend time with you discussing how to quit smoking

Suggest that you set a specific date to stop smoking

Prescribe a nicotine nasal spray or nicotine inhaler

Prescribe a pill like Zyban© (also known as Wellbutrin© or bupropion to help you quit)

Recommend using nicotine gum

Recommend using a nicotine patch

Suggest you attend a class or program to stop smoking

Provide you with booklets, videos or other materials to help you quit smoking on your own

Refer you to counseling for help with quitting

Ask if a family member of friend would support your decision to quit

Refer you to a national or state quit line

77. During the last 3 months of your most recent pregnancy, about how many servings of fruits or vegetables did you have in a day? Check one answer

Less than 1 serving per day

1 or 2 servings per day

3 or 4 servings per day

5 or more servings per day

78. During your most recent pregnancy, did you get any of these services? For each one circle y (yes) if you got the service or circle n (no) if you did not get it.

Childbirth classes

Parenting classes

Classes on how to quit smoking

Visits to your home by a nurse or other health care worker

Food stamps

TANF (welfare)

79. Listed below are some statements about safety. For each one, circle y (yes) if it allies to you or circle n (no) if it does not.

My infant was brought home from the hospital in an infant care seat

My baby always or almost always rides in an infant car seat

My home has a working smoke alarm

There are loaded guns, rifles, or other firearms in my home

80. Are you currently in school or working outside the home?

No Go to Question 82

Yes

81. Which one of the following people spends the most time taking care of your new baby when you get to work or school? Check one answer.

My husband or partner

Baby's grandparent

Other close family member or relative

Friend or neighbor

Babysitter, nanny, or other childcare provider

Staff at daycare center

Other: Please tell us_____

82. This question is about the care of your teeth during your most recent pregnancy. For each item, circle y (yes) if it is true or circle n (no) if it is not true.

N/Y

I needed to see a dentist for a problem

I went to a dentist or dental clinic

A dental or other health care worker talked with me about how to care for my teeth and gums

83. What is today's date?

[BOX] [BOX] [BOX]

Month Day Year

Please use this space for any additional comments you would like to make about the health of mothers and babies in _____.

Thanks for answering our questions!

Your answers will help us work to make Louisiana mothers and babies healthier.

Appendix C: The University of Texas at Tyler Institutional Review Expedited Approval

The University of Texas at Tyler
Institutional Review Board

July 15, 2011

Dear Dear Ms. Craighead:

Your request to conduct the study entitled *Early Term Infant Care: Hospital Utilization and Feeding Practices* is approved as an expedited study, IRB #SUM2011-80 by The University of Texas at Tyler Institutional Review Board. This approval includes a waiver of written informed consent. Please ensure that any research assistants or co-investigators have completed human protection training, and have forwarded their certificates to the IRB office (G. Duke).

Please review the UT Tyler IRB Principal Investigator Responsibilities, and acknowledge your understanding of these responsibilities and the following through return of this email to the IRB Chair within one week after receipt of this approval letter:

- This approval is for one year, as of the date of the approval letter
- Request for Continuing Review must be completed for projects extending past one year
- Prompt reporting to the UT Tyler IRB of any proposed changes to this research activity
- Prompt reporting to the UT Tyler IRB and academic department administration will be done of any unanticipated problems involving risks to subjects or others
- Suspension or termination of approval may be done if there is evidence of any serious or continuing noncompliance with Federal Regulations or any aberrations in original proposal.
- Any change in proposal procedures must be promptly reported to the IRB prior to implementing any changes except when necessary to eliminate apparent immediate hazards to the subject.

Best of luck in your research, and do not hesitate to contact me if you need any further assistance.

Sincerely,

Gloria Duke, PhD, RN

Gloria Duke, PhD, RN
Chair, UT Tyler IRB

Appendix D: Louisiana Department of Health and Hospitals Office of Public Health Approval to Use LaPRAMS Data

AGREEMENT FOR SHARING Louisiana PRAMS DATA WITH EXTERNAL RESEARCHERS

I, __Debra V. Craighead_____, as principal investigator on this proposed analysis of Louisiana Pregnancy Risk Assessment Monitoring System (LaPRAMS) data, agree to the following requirements for the use of LaPRAMS data and assure compliance with the following requirements:

1. I will not use nor permit others to use these data for any other purpose than that described in the proposal, titled _Early Term Infant Care: Hospitalization and Feeding Practices_, dated __11/15/11___, which accompanies this statement.

2. I will not release nor permit others to release the data set or any part of it to any person other than those listed as collaborators in the attached proposal.

3. I will not attempt or permit others to use the data set to attempt to learn the identity of any participant. If the identity of a respondent should be inadvertently discovered, I will make no use of this knowledge, nor will I permit others to use the knowledge. I will inform the Louisiana PRAMS staff of the discovery, so they can prevent future discoveries. I pledge that neither I nor other members of my team will inform anyone else of this knowledge.

4. All oral or written presentations/reports/manuscripts including the results of analyses using LaPRAMS data will include the following acknowledgment: "These data were provided by the Louisiana PRAMS Program with assistance from the Centers for Disease Control and Prevention. The findings and conclusions in this report are those of the authors and do not necessarily represent the position of Louisiana PRAMS or the Centers for Disease Control and Prevention."

5. All oral or written presentations/reports/manuscripts including the results of analyses using LaPRAMS data will be submitted to the Louisiana PRAMS staff as a courtesy.

6. When the proposed analyses are completed, all copies of these data will be destroyed (confirmed in writing) or returned to Louisiana PRAMS.

My signature indicates my agreement to comply with these requirements:

__Debra V. Craighead_____
Name

Debra V. Craighead
Signature

RN, PhD(c)
Title

The University of Texas at Tyler_____
Organization

Approval:
Adrienne Turley
LaPRAMS Signature

March 27, 2012
Date

Appendix E: Biographical Sketch

BIOGRAPHICAL SKETCH

Provide the following information for the Senior/key personnel and other significant contributors in the order listed on Form Page 2.
Follow this format for each person. DO NOT EXCEED FOUR PAGES.

NAME	POSITION TITLE
Debra V. Craighead	Graduate Student, University of Texas at Tyler
eRA COMMONS USER NAME (credential, e.g., agency login) PhD, RN	Part-time Instructor, University of Louisiana Monroe

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable.)*

INSTITUTION AND LOCATION	DEGREE *(if applicable)*	MM/YY	FIELD OF STUDY
Northwestern State University	BSN	05/83	Nursing
Northwestern State University	MSN	08/93	Nursing
The University of Texas at Tyler	PhD	05/12	Nursing

A. Personal Statement: The process of giving birth is one of the most natural and profound events in the life of a woman. When everything goes right, it is an event surrounded by anticipation and joy. Modern technology advances have made it possible to have positive outcomes even in cases where everything does not go right. However, the availability and acceptance of medical intervention has blurred the lines between necessity and convenience when it comes to intervening in delivery options for pregnant women. This study is provides an in-depth view of the nuances between early term and term infants and a comparison of outcomes related to these births. This retrospective descriptive study was performed to examine care practices needed for the early term infant in order to promote

B. optimal health outcomes. Secondary data analysis of Louisiana Certificate of Live Birth (LCLB) linked with Louisiana Pregnancy Risk Assessment Survey (LaPRAMS) data was performed to examine differences in care practices related to NICU admission, length of stay, breast feeding initiation and breast feeding duration in the early term (37 to 38 weeks) and full term (39 to 41 weeks) infant. The Conceptual Model for Care of the Late Preterm Infant (Medoff-Cooper, Bakewell-Sachs, Buus-Frank & Santo-Donato, 2005) developed to guide care practices and optimize health outcomes in LPI within the gestational age range of 34 to 36 completed weeks was used to examine care needs for the early term infant. Ultimately this information may be used to promote the establishment of practice guidelines for caring for the vulnerable ETI.

C. I have a broad background in maternal child nursing with specific training and expertise in neonatal nursing. I have produced a peer-reviewed publication from my state of the science research on early term infants. I have applied for an Association of Women's Health, Obstetric and Neonatal Nurses (AWHONN) Novice Researcher Grant in an attempt to conduct additional productive research projects in the area of caring for early term infants, and my expertise and experience have prepared me to lead the proposed project.

D. Positions and Employment

2011 to Present
Assistant Professor of Nursing
Pediatric Nursing (NURS 3034)
Special Issues in Nursing (NURS 4029)
Nursing Research (NURS 4030)
University of Louisiana at Monroe
Monroe, LA

2009 to 2011
Part-time Instructor of Nursing/ Lab Coordinator
Special Issues in Nursing
Nursing Research
University of Louisiana at Monroe
Monroe, LA

2007 to 2009
Assistant Professor of Nursing
Introduction to Nursing/ Child Health Maintenance

Louisiana Tech University
Ruston, LA

2005 to 2007
Clinical Nursing Instructor
Introduction to Nursing/ Adult Health Nursing I
Louisiana Tech University
Ruston, LA

1993 to 1997
Assistant Professor of Nursing
Introduction to Nursing/ Adult Health Nursing I/ Maternity Nursing
Louisiana Tech University
Ruston, LA

1983 to 1997
Staff Nurse/Charge Nurse/Education Coordinator
NICU St. Francis Medical Center
Monroe, LA

E. Professional Memberships

Association of Women's Health, Obstetric and Neonatal Nurses, 2009 to present
Alpha Chi National College Honor Scholarship Society, Texas Chapter, 2011 to present
Sigma Theta Tau Honor Society of Nursing Iota Nu Chapter, University of Texas at Tyler, 2009 to present
The Honor Society of Phi Kappa Phi, University of Texas at Tyler, 2012

F. Community Service

Fetal and Infant Mortality Review (FIMR) Community Action Team, Children's Coalition, Monroe, Louisiana, 2009 to Present

G. Publications

Craighead, D. (2012). Early term births understanding the health risks to infants. *Nursing for Women's Health, 16*(2), xx-xx.

H. Presentations

Presenter: Hospital Consumer Assessment of Healthcare Systems and Providers (HCAHPS) Glenwood Regional Medical Center West Monroe, LA: 3/11/11, 3/31/11, 4/8/11. 4/11/11, 5/6/11, 5/13/11

Guest Lecture University of Louisiana Monroe, Nursing 430 Research Understanding Statistics in Research 11/8/10, 3/28/11