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School of Public Health

**PSYCHOSOCIAL SUPPORT, NEWBORN READMISSIONS, AND
POSTPARTUM FOLLOW-UP**

By

Dora Barilla, MPH, CHES

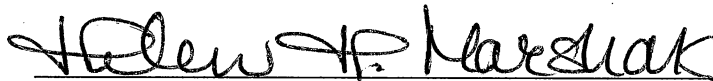
A Dissertation in Partial Fulfillment of the Requirements for the
Degree of Doctor of Public Health in Health Education

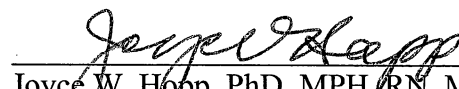
June 2008


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Dora Barilla

Each person whose signature appears below certifies that this dissertation, in his/her opinion, is adequate in the scope and quality as a dissertation for the degree of Doctor of Public Health.


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ABSTRACT OF DISSERTATION

Psychosocial Support, Newborn Readmissions, and Postpartum Follow-up

By

Dora J. Barilla, MPH, CHES

Doctor of Public Health Candidate in Health Education

Loma Linda University, Loma Linda, CA, 2008

Helen Hopp Marshak, PhD, MS, CHES, Chairman

Background. Women and their infants are being discharged as soon as 24 hours after giving birth without proper follow-up care. The Maternity Department at San Antonio Community Hospital established the Family Care Center (HBFCC) in November 2000 in response to a higher than expected newborn readmission rate, shorter maternity hospitalizations, and a lack of postpartum follow-up. A comprehensive program was offered to support new families in the form of developmental assessment and intervention, breastfeeding, infant and toddler nutrition, health promotion and education, and referrals to appropriate agencies when indicated. In 2004, due to inadequate funding, the hospital reduced the intervention to a postpartum clinic that included limited breastfeeding support 2 weeks following birth.

Purpose. The purpose of this study was to determine if there is a positive relationship between the degree of psychosocial support offered (comprehensive, limited, or none) by healthcare providers and the rate of normal newborn readmissions. In addition, a cost-benefit analysis was performed to compare the costs of the intervention to

the costs for normal newborn readmissions to establish whether such interventions are worthwhile from an economic viewpoint.

Design and Method. The study utilized an interrupted time series design with a partial reversal of the intervention. The study included a retrospective analysis of a secondary dataset of normal newborn readmissions at SACH at *baseline*, 1 year prior to the onset of a *comprehensive* psychosocial intervention for new mothers and babies (1999-2000), the 4 years during the *comprehensive* psychosocial intervention (2001-2004), and 2 years post-intervention during a partial reversal or *limited* psychosocial intervention (2004-2006). The data were collected in fiscal years from July 1 – June 30 to coincide with the cost-benefit analysis. Participants included normal newborn births or a diagnosis related group (DRG) of 391 from July 1, 1999-June 30, 2006. A one-way ANOVA was conducted to determine if there were significant differences in average costs per patient across all three time periods.

Results. There was a significantly lower readmission rate 1.0% ($p < .001$) compared to baseline (2.3%), or during the limited psychosocial support intervention time period (2.3%). While there was no significant difference in the average cost per newborn readmitted across the three study time periods, during the comprehensive intervention time period, the average costs of a normal newborn readmission were significantly lower (\$4,180, $p = .041$) for those who received the intervention compared to those who did not (\$5,338). The two-way ANOVA comparing the average costs per newborn readmission across all three time periods showed a significant interaction ($p = .04$) across limited and comprehensive time periods and whether or not the individual received the intervention. The average costs of normal newborn readmissions for those

receiving the intervention during the limited time period was \$4,845 compared to those not receiving the intervention (\$3,785). There was a cost-benefit of \$513,540 due to fewer readmissions during the comprehensive psychosocial support time period but it did not exceed the cost of the intervention attributed to care in the first 28 days postpartum (\$1,183,600).

Significance to Health Education. With healthcare costs continuing to increase and early discharge programs following delivery a common practice, understanding the potential effects of psychosocial support in a postpartum program is essential. Providing comprehensive follow-up for new mothers in the postpartum period can reduce normal newborn readmissions and potentially lower the average charges for newborn readmissions for those who receive psychosocial support.

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CHAPTER 1

INTRODUCTION

A. Statement of the Problem

Healthcare spending continues to rise at the fastest rate in history. In 2005, total spending was \$2.1 trillion or \$6,700 per person and total healthcare spending represented 16% of the gross domestic product (GDP). United States (U.S.) healthcare spending is expected to increase at similar levels for the next decade reaching \$4 trillion in 2015, or 20% of the GDP (Borger, 2006).

Currently the U.S. has over four million births per year, making childbirth the most common cause of hospitalization (Paul, Phillips, Widome, & Hollenbeak, 2004). These hospitalizations come with a significant cost and attempts for cost reduction have resulted in numerous efforts over the past two decades aimed at reducing postpartum length of stay. As a result, shortened hospitalizations for mothers and infants have become a trend in the healthcare industry. Women and their infants are being discharged as soon as 24 hours after giving birth, leading to a lack of proper postpartum care (Gailbraith, Seidman, & Stevenson, 2003). Healthcare providers need to redefine the way they follow newborns and mothers after they are discharged from the hospital to decrease costs while providing quality care to both mother and baby.

Eaton (2001) found that adequate follow-up care after delivery is not a standard of care for early discharged patients. The American College of Obstetricians and Gynecologists (ACOG) defines early discharge as a post delivery stay of less than 48

hours for vaginal deliveries and less than 96 hours for cesarean sections. Researchers have predominantly focused on the importance of routine postpartum care following early discharge with minimal recommendations or support for health promoting activities for the mother and infant and building strong relationships with service systems that provide social as well as health-focused services (Galbraith, Egerter, Marchi, Chavez, & Braveman, 2003). Research, policy, and legislation have concentrated on the number of hours of postpartum hospital stay, rather than on the needs of the mother and newborn and on the content and quality of the care they receive. This focus reflects the limitations of measuring quality and the effectiveness of healthcare services. Providers have raised concerns that the widely accepted "minimum" hospital stay of 48 hours does not provide sufficient time for newborns and their mothers to receive needed postnatal and postpartum services (Eaton, 2001). In the absence of effective plans for follow-up care, there is not conclusive evidence supporting the safety, for both mother and infant, for early hospital discharge following an uncomplicated vaginal delivery (McPherren & Marnejon, 1995; Apgar, 1997).

Birthing hospitals have struggled to comply with the insurance mandates for shortened hospitalizations, while continuing to provide quality and comprehensive services that are needed during childbirth and postpartum (Williams & Cooper, 1996). Education and psychosocial support in the hospital are often overlooked because other essential functions such as monitoring and support to ensure infant stabilization, recommended immunizations, mandatory screening for genetic disorders, and assessment of major medical risk factors must be performed during the short hospital

stay. In addition, mothers often suffer from exhaustion immediately following birth and are unable to fully comprehend the education provided in the hospital regarding the care for themselves and their infants.

Jaundice and dehydration are the most common reasons for normal newborn readmissions. The danger of failing to recognize and treat neonatal jaundice has been confirmed by reports of kernicterus, a form of brain damage caused by excessive jaundice, in full term healthy newborns who had no apparent jaundice in the first 24 hours, and no other cause than inadequate breastfeeding (Maisels, 1995). Follow-up care 48 to 96 hours after discharge from the hospital provides an effective means of reducing jaundice and dehydration by reinforcing proper breastfeeding practices (Lock & Ray, 1999).

Early problem identification and treatment during the postpartum period has a positive effect on family well-being and the early growth and development of infants. Altieri and Gaffney (2001) reviewed interventions that promote infant growth, and found that mothers most preferred intervention strategies that use interpersonal communication, including the opportunity for mothers to ask questions. Mothers least preferred strategies included one-way messages such as written material, discharge instructions, and videos. Interventions that do not appeal to mothers are likely to be ineffective in promoting health and are wasteful of healthcare dollars.

The postpartum period presents a unique opportunity to respond to the special needs of both the mother and baby. Important components of postpartum care that are often over-looked are maternal nutrition, breastfeeding support, birth spacing,

postpartum distress, as well as the detection of complications for the newborn and mother (Korfmacher & Kitzman, 1998). Beck et al. (1992) found that maternal concerns were most often associated with maternity blues, postpartum depression, and emotional issues. Follow-up visits after early discharge not only provide an opportunity to identify health issues of newborns and concerns of mothers, but present opportunities to make referrals to appropriate care providers (Guise, 2003).

The needs of mother and baby in the postpartum period are not only physical but also have a significant emotional component. To provide only physical assessments and treatment neglects the psychosocial needs of the newborn and mother. With technical advancements, the medical community often dismisses the value of psychosocial support in treating patients. Rarely does one see postpartum programs with traditional medical models emphasizing the importance of psychosocial support (Eaton, 2001).

In 1996, President Clinton signed into law the Newborn's and Mothers' Health Protection Act of 1996 (NMHPA) that established a general rule that group health plans and health insurance issuers may not restrict benefits for hospital lengths of stay in connection with childbirth. As a part of the legislation, the Secretary's Advisory Committee on Infant Mortality (SACIM) was designated to act as an advisory panel. Their initial report to Congress included a strong recommendation that the goal of postpartum care should be good health and well-being, not only the prevention of rare catastrophic events. The outcomes specified in the legislation included the initiation and continuation of breastfeeding, timely use of preventive and curative services for the

infant and mother, the occurrence and severity of postpartum depression, the mother's physical comfort, overall functioning, sense of competence with parenting, and the adoption of healthy lifestyles such as a healthy diet and elimination of substance abuse (Eaton, 2001).

Nassens et al. (2005) found that patients with persistently high healthcare utilization were either patients with unstable chronic medical conditions or psychophysiologic diagnoses that would benefit from more directed, formal, and organized approaches to reduce stress and address non-medical issues. Unidentified psychosocial issues resulted in persistent and high healthcare utilization. Shorter lengths of hospital stay after birth have shifted services that were previously addressed in the hospital to either an outpatient clinical setting or the home. The healthcare needs of the newborn and mothers provided in the hospital include monitoring and support to ensure infant stabilization, performance of recommended immunizations, mandatory screening for genetic disorders, and initiation of infant feeding and assessment of major medical risk factors. Other standards of care such as infant and self-care, and training in breastfeeding and lactation may be included but are far from guaranteed due to shorter lengths of hospital stay (Eaton, 2001). With the demanding physical healthcare needs of both newborn and mother during the short hospital stay, psychosocial issues for all mothers, not just those previously thought at risk, are often overlooked (Paul, Lehman, Hollenbeak, & Maisels, 2006).

Follow-up care following early discharge is mandated by law, but is not a standard of care, even when covered by insurance companies (Gailbraith, Seidman, &

Stevenson, 2003). Furthermore, the standardization and guidelines for follow-up are not consistent among healthcare providers. Breastfeeding is an important health promotion activity, yet little is known about which promotional strategies are the most effective as a part of follow-up care. The rising costs of healthcare, the trend towards early discharge in childbirth, and the lack of standardizations for postpartum programs present a challenge in effectively addressing comprehensive postpartum care. This research examined the effect of psychosocial support provided by healthcare professionals as part of a comprehensive intervention in the postpartum period on normal newborn readmissions.

B. Purpose of the Study

The purpose of the proposed study was to determine if there is a positive relationship between psychosocial support provided by healthcare providers during the postpartum period (comprehensive, limited, or none) and normal newborn readmissions. Although there is research examining the relationship between health outcomes and psychosocial support in cancer patients (Rankin, 2000), there is a lack of research on psychosocial support for new mothers in the postpartum period. In addition, a cost-benefit analysis was performed comparing the costs of the intervention to the costs for normal newborn readmissions and average costs per patient across study time periods. The costs of the intervention were determined to quantify whether the cost per patient for the intervention equates to a savings in healthcare dollars.

The hypothesis for this research project was that normal newborn readmission rates would be lower during those times when comprehensive psychosocial support in

the postpartum period was available for new mothers and infants, compared to no intervention or limited to breastfeeding support.

C. Research Questions

1. Were normal newborn readmission rates lower among babies of mothers who received comprehensive psychosocial support from healthcare providers following discharge from the hospital after the birth of their babies compared to limited psychosocial support and/or none at all?
2. Was there a significant reduction in healthcare costs for normal newborn readmissions when comprehensive psychosocial support for new mothers and babies was introduced?

D. Theoretical Framework

Social cognitive theory (SCT) served as the theoretical framework for this study. Social support, social integration, and the empowerment of the healthcare providers in promoting social connectivity are the constructs supporting the comprehensive psychosocial support intervention.

1. Social Support

Predictors of health and well-being are correlated with the structure and the provision of an individual's social networks and relationships (Cacioppo, Hawkley, Crawford, Ernst, Burleson, & Kowalewski, 2002). Cohen (2004) refers to social support as stress buffering in that it eliminates or reduces the effects of stressful experiences. The effects of social support are mainly observed during times of stress, such as the postpartum period. Postpartum is not only a time of hormonal instability

for new mothers but a major life altering experience (Frank-Hanssen, Hanson, & Anderson, 1999). Research shows a positive relationship between social support and health (Cohen, 2004; Fawzy, 1999).

Cohen (2004) defines social support as a social network's provision of psychological and material resources intended to benefit an individual's ability to cope with stress. Cohen argues that the availability of a wide range of social networks provides multiple opportunities for information that could influence health-relevant behaviors, results in more effective use of available services, and empowers an individual to avoid stressful or high risk situations. House and Kahn (1985) further define social support into three categories: instrumental, informational, and emotional. Instrumental support includes the provision of tangible assistance such as help cleaning the house or financial support for a mother on disability for childbirth. Informational support refers to the provision of relevant information for the purpose of assisting an individual to deal with current challenges. Informational support is usually provided via advice or guidance in dealing with current challenges such as coping strategies for inappropriate comments to new mothers regarding their feeding choices for the babies. Informational support in the form of breastfeeding education, social services that strengthen the capacity of families, and instructions for infant and self-care are related to improved physical and mental health in the postpartum period (Berkman, 2000; Eaton, 2001). Emotional support is the expression of empathy, caring, reassurance, and trust. Emotional support also involves opportunities for expressing one's emotions and venting. Healthcare providers are in a unique position to educate prospective parents

about the importance of social support around the time of childbirth and may play a critical role in mobilizing support systems for new mothers. Often new mothers need an outlet to discuss the challenges of the transition to parenthood.

2. Social Cognitive Theory

SCT explains how people acquire and maintain certain behavioral patterns, while also providing the basis for effective intervention strategies (Bandura, 1997). In SCT, behavioral changes are dependent upon three factors: environment, people and behavior. These three factors are constantly influencing each other through a process termed reciprocal determinism. Mothers are often discharged from the hospital before they have time to absorb the birth process let alone the life transitions ahead of them. Comprehensive postpartum programs provide mothers a non-threatening and relaxed environment to establish effective breastfeeding techniques. Early discharge after delivery may be safe, so long as the mother has some form of psychosocial support until breastfeeding is well established and her confidence in her ability to feed her baby properly is strong. In newborn infants, the liver and intestinal systems are immature and are unable to excrete bilirubin as fast as their body produces it. Inadequate breastfeeding can be a marker for hyperbilirubinemia because the bilirubin is not out of the body (Blackwell, 2003). Treatment of jaundice is to keep the infant well hydrated and if the mother is experiencing difficulty breastfeeding the infant is not hydrated and experiences difficulty excreting the excess bilirubin. Therefore, providing breastfeeding and psychosocial support during this critical time period can

increase the amount of fluids received by the infant and decrease the likelihood of jaundice.

Support and guidance given should be given by healthcare providers who have the time to work through both physical and mental issues the mother may encounter. SCT provided a framework for the design, implementation and evaluation of the HBFCC intervention. As mentioned earlier, the constructs supporting this theoretical framework include social support, social integration, and the empowerment of the healthcare providers in promoting social connectivity. Social support, in the context of the postpartum period, can be defined as informational support and the emotional comfort given to new mothers by family, friends, co-workers and healthcare providers. Social support can be defined as a community of people who love and care, value and think well of someone as an individual. A critical component of social support is that a message or communicative experience does not constitute support unless the receiver views it in that manner. Brissette et al. (2000) define social integration as participation in a broad range of social relationships. Many new mothers have minimal support following childbirth and effective postpartum programs can be instrumental in referring mothers to appropriate social networks. The empowerment of healthcare providers in promoting social connectivity includes time, resources, and environments allocated to new mothers in postpartum programs. The mechanisms for influencing these constructs are health policies in birthing hospitals that provide psychosocial support, assessment of the home environment, observational learning, emotional coping skills, reinforcement, availability of social support by healthcare providers, and stress

management. These mechanisms can result in enhanced self-efficacy in their parenting skills as a new mother.

Social factors play an important role in the decision making of new mothers and researchers have shown them to be significant predictors of a mothers' infant feeding behavior. Parental infant feeding attitudes are stronger predictors of both choice of infant feeding method and duration of breastfeeding than social risk factors such as demographics or income level. The father's infant feeding attitude, as perceived by the mother, is the strongest predictor of breastfeeding (Scott, Binns, Graham, & Oddy, 2006). Postpartum programs that include additional family members in the education process can be a critical component in the breastfeeding support system for new mothers. If the mother is the only one to receive support and education on infant care and breastfeeding and then returns to the family environment which varies in attitudes and social norms, it may be difficult for her to maintain her newly adopted behavior.

Psychosocial support from lactation educators provides an opportunity to affect knowledge, attitudes, self-efficacy, reinforcement, and observational learning about breastfeeding and caring for their infant (Goulet, Fall, D'Amour & Pineault, 2007). The psychosocial support provided by healthcare professionals in turn should improve breastfeeding skills of new moms, thereby reducing jaundice and dehydration which ultimately reduces normal newborn readmissions.

Often social risk factors such as a lack or failed social support system, substance abuse, low educational attainment, or personal characteristics often are not detected during a short hospital stay and may be overlooked in routine postpartum follow-up.

Obstetricians place little emphasis on social risk factors or demographic variables as determinants of the need for close follow-up of new mothers (Paul et al., 2007). A comprehensive postpartum intervention provides a non-threatening environment with a multi-disciplinary team to identify not only physical but potential psychosocial factors that may inhibit effective breastfeeding and adequate care of the newborn. A multi-disciplinary team includes appropriate healthcare providers who can address a broad range of risk factors effectively.

Social support from healthcare professionals also provides opportunities to monitor the skills of new mothers, solve issues that may not be directly related to breastfeeding, and increase self-assurance that may improve breastfeeding skills. Shonkoff and Meisels (2000), who have thoroughly reviewed early childhood interventions, concluded that multidisciplinary services provided to children from birth to 5 years of age (1) have demonstrated enhanced emerging competencies, (2) minimized developmental delays, (3) re-mediated existing or emerging disabilities, (4) prevented functional deterioration, and (5) promoted adaptive parenting and overall family functioning. The multifaceted approach to providing psychosocial support emphasizes the notion of practitioner concern for patients as individuals, a critically important component of providing quality medical care (Rankin, 2000).

No single intervention is ideal for every new mother and each woman's psychosocial needs may vary. Fawzy (1996) has shown that education, coping, emotional support and psychotherapy are generally helpful when used individually but are even more powerful and enduring when used in combination. Thus, a multi-

strategy and comprehensive approach to postpartum care is more likely to identify and address the varied needs of new mothers.

3. Breastfeeding

The American Academy of Pediatrics (AAP) advocates breastfeeding as the optimum form of nutrition for infants. The advantages to infants, mothers, families, and society from breastfeeding include benefits in health, nutrition, immunologic, developmental, psychological, social, economic, and environmental benefits (AAP, 1997). As a result, more women are opting to breastfeed yet adequate breastfeeding support services are often unavailable for women (Scott, Binns, Graham, & Oddy, 2006).

The AAP guidelines for a follow-up visit within 48 hours of discharge from the hospital has multiple purposes: (1) to assess the infant's general health, hydration, and degree of jaundice, (2) to observe and evaluate infant feeding, and (3) to observe parent-infant interaction and infant behavior (AAP Committee on Fetus and Newborn, 1995). These established guidelines support the value of identifying psychosocial issues in the postpartum period.

Hyperbilirubinemia is a marker for inadequate breastfeeding (Augustine, 1999). Hyperbilirubinemia is the elevation of the bilirubin level in the blood of the newborn, which results in yellowish staining of the skin and whites of the newborn's eyes by pigment of bile (bilirubin). Neonatal hyperbilirubinemia is also referred to as neonatal jaundice and physiologic jaundice of the newborn. Normal neonatal jaundice typically appears between the 2nd and 5th days of life and clears with time.

Hyperbilirubinemia commonly develops 24 to 96 hours after delivery. The majority of readmissions for hyperbilirubinemia occur within 3 to 5 days following birth. If patients have been discharged less than 48 hours following childbirth, assessment, observation, and support is often unavailable during this critical time period. In the United States women are discharged with little or no help at home. New mothers who lack support are prone to postpartum sadness and problems with breastfeeding (Yamauchi, & Yamanouchi, 1990). Sending new mothers home early from the hospital may be perfectly acceptable if they have help at home or in the community until breastfeeding is well established and their confidence is sufficient, but with jaundice the leading cause of newborn readmissions, this demonstrates it is not the case (Office Statewide Health Planning and Development, 2002). Follow-up visits within 3 to 5 days post discharge could result in earlier recognition of and increased outpatient intervention for both dehydration and jaundice, especially for those without good support systems. The means by which psychosocial support facilitates proper breastfeeding has not been investigated in depth, although a key determinant of breastfeeding is social support by family members (Scott et al., 2006).

The U.S. healthcare system does not encourage health promotion efforts and emphasizing supportive social interactions between healthcare providers and patients. There are limited reimbursement or incentive systems in healthcare to promote breastfeeding or to spend time talking to patients to assess the social mechanisms that may affect their health. Patients are discharged from the hospital before there has been adequate time to assess the family dynamics or whether a new mother has an adequate

support system thus creating an environment conducive to ineffective breastfeeding and potential for readmission to the hospital.

4. Cost-benefit Analysis

A cost-benefit analysis (CBA) is a widely used technique that totals the equivalent money value of the benefits and costs to the community of projects or interventions to establish whether they are worthwhile from an economic viewpoint (Graham, 2003). Benefits are assigned a monetary value and indicate whether a specific strategy results in a net gain or loss. CBAs are utilized with only financial costs and benefits. Solutions generated in response to an identified problem may be creative but may not be beneficial in implementation if the time and money expended are not worthy of the effort. A CBA should be proportional with the size, complexity and cost of the intervention. A CBA assigns dollar values to costs and benefits to determine whether the benefits realized exceed costs for a particular program and is different from a cost-effectiveness analysis. A cost-effectiveness analysis (CEA) is often considered better than a CBA in situations when assigning dollar values to benefits for which market prices do not exist, such as a person's life. In these scenarios, a CEA may be a more appropriate method than CBA since CEA does not attempt to assign a monetary value to outcomes, but uses a cost-per-unit outcome. CEA is most useful when the goal is to identify the most cost-effective strategy from a set of alternate interventions that produce a common effect. Units of measurement for CEA might include the disease prevented, head injuries averted or number of lives saved.

For this study we utilized a CBA and not a CEA for the purposes of looking at postpartum programs from an economic perspective.

The efforts to reduce healthcare costs can present opportunities for innovative programs focusing on health education and prevention. A CBA can be utilized as a significant framework in helping policy makers identify effective programs that having tangible economic benefits to the healthcare system.

E. Significance to Health Education

Experts agree that the U.S. healthcare system is riddled with inefficiencies, excessive administrative expenses, inflated prices, poor management, and inappropriate care, waste and fraud (Borger, 2006). Prevention, education, and cost effective programs represent important changes to the healthcare system that have the potential to decrease costs and improve quality. With the current economic struggles facing healthcare, effective and comprehensive maternity care is becoming an increasingly difficult challenge for birthing hospitals (Keppler & Roudebush, 1999; Paul et al., 2004). Current health policies provide incentives for treatment over prevention and education, this reimbursement system promotes problems and costs that could have been avoided if appropriate prevention and interventions were provided at critical time periods.

With healthcare costs continuing to increase and early discharge programs following delivery a common practice, understanding the components of an effective and sustainable postpartum program is essential. Health education programs are often the first service line to be eliminated in times of economic hardships. Health educators

need to find additional analysis to quantify the economic benefits of prevention in both short and long term benefits. Additional data collection skills in quantifying social benefits to health promotion should be explored in future research.

Postpartum follow-up visits are associated with a significant reduction in the need for subsequent hospital and emergency department services for jaundice and dehydration in the newborn (Paul et al., 2004). Both emergency department visits and in-patient beds are in high demand making measures to reduce the utilization for these services imperative. Hospital administration and community benefits often speak different languages in terms of outcomes. Hospitals are concerned about bottom lines and community benefits are concerned about the public health needs of the community. Combining the language of cost, quality, and access into health education terms bridges the widening gap for both health education and health administration.

This study evaluated the cost-benefit of a health education program while examining its quality, making the results useful to both health educators and health administrators. Additionally, this study provides information to healthcare providers, administrators and health plans on the impact of psychosocial support on new mothers and infants for future guidelines and protocols for postpartum programs.

The Institute of Medicine recommends a dramatic change in how the U.S. healthcare system ensures the safety of patients (Maisels & Kring, 2004). They are calling for a change in perspective as an individual responsibility to the concept of safety as a systems issue. The U.S. healthcare system is designed around the needs of an individual. There is currently a wide-spread effort to recognize the importance of

prevention and population health (Bar-Yam, 2006). A part of the paradigm shift is the involvement of patients and families as partners in the healthcare process. Value based healthcare is a new approach to improving quality through reimbursements based upon population health outcomes. Health education is well equipped for prevention and to improve population health and could play a major role in reframing this paradigm through such programs of which this research is an example.

CHAPTER 2

LITERATURE REVIEW

A. Introduction

During the postpartum period it is critical to respond to the special needs of both the mother and baby. The medical community has minimized the importance of social connectivity for new mothers and only incidentally considered psychosocial health independent of traditional medical care in postpartum. Routine postpartum follow-up addresses the most common complications leading to maternal death, such as postpartum hemorrhage, puerperal infections, and eclampsia, but the psychosocial issues of the new mother are usually overlooked (Galbraith et al., 2003; McPherrren & Marnejon, 1995).

The gravitation away from a high touch and low technology medical model may have unintended consequences. With the increase in technology, the medical community often dismisses the value of psychosocial support in treating patients (Martines et al., 2005). Increasingly, healthcare providers are recognizing that humans are comprised of physical, psychosocial, and spiritual entities by using alternative medical treatments (Thio & Elliot, 2005; Nazmiye, Yasemin, Mine, & Sedat, 2007). While the role of social relationships and its impact on health has been studied, less has been done to examine the role of social support from the healthcare provider and its impact on the well-being of patients.

Important components of postpartum care often overlooked are the prevention and early detection of maternal and newborn complications, breastfeeding support, birth spacing, immunization and maternal nutrition (Korfmacher & Kitzman, 1998). Postpartum programs should be comprehensive and have a holistic approach to address the multiple needs of new families. If neonatal mortality rates in low income countries can be improved without high technology, other developed countries such as the U.S. can glean lessons learned from these comprehensive and holistic interventions for new mothers and newborns (Martines et al., 2005). With healthcare costs continuing to rise and early discharge programs following delivery a common practice, identifying an effective combination of a postpartum intervention designed to provide psychosocial support along with appropriate medical treatment is critical. In this literature review I will examine the relationship between psychosocial support, postpartum programs, breastfeeding, and health outcomes.

B. Breastfeeding

The public health benefits of breastfeeding are well documented and policy statements around the world reflect this importance. Breastfeeding is the most cost-effective, health promoting, and disease preventing activity new mothers can perform (World Health Organization, 1990). Researchers in recent years have documented compelling advantages to breastfeeding that are unequivocal (AAP, 1997). With the acknowledgement that breastfeeding is the gold standard for infant feeding, any quality postpartum program should include breastfeeding support as a means to improve health. Although breastfeeding initiatives exist throughout the country, guidelines for

clinicians' office or hospital practice to improve breastfeeding do not exist (Guise et al., 2003).

Social inequities, such as lower maternal age, low levels of education, ethnic background, and lower family income, are less apparent as determinants of breastfeeding initiation (Scott et al., 2006). Breastfeeding determination in 2002-2003 was closely related to parental attitudes on breastfeeding rather than on sociodemographic characteristics. The shift in factors that determine breastfeeding may provide evidence that interventions should focus on family attitudes and beliefs about breastfeeding (Scott et al., 2006). Psychosocial support for both mother and father may be an underutilized and critical link in supporting proper breastfeeding for the infant.

As a part of the new guidelines for the management of hyperbilirubinemia, the AAP recommends that clinicians do the following: 1) promote and support successful breastfeeding; 2) perform a systematic assessment before discharge for the risk of severe hyperbilirubinemia; 3) provide early and focused follow-up based on the risk assessment; and 4) when indicated, treat newborns with phototherapy or exchange transfusion to prevent the development of severe Hyperbilirubinemia (AAP, 2004). The AAP has identified breastfeeding support and risk assessment as a key guideline for the management of hyperbilirubinemia.

C. Early Discharge and Newborn Readmissions

The most common reason for newborn readmissions to the hospital after early discharge is neonatal jaundice (Augustine, 1999; Geiger, Petitti, & Yao, 2001; Gaffney & Altieri, 2001). Neonatal jaundice, commonly referred to as hyperbilirubinemia, is a

marker for inadequate breastfeeding (Malkin, Broder, & Keeler, 2000). Follow-up care 48 to 96 hours after discharge from the hospital provides an effective means of reducing jaundice by reinforcing breastfeeding practices (Blackwell, 2003).

Two additional causes of normal newborn readmissions are dehydration and weight loss in newborns. Lactation consultants who reinforce breastfeeding practices have been successful in preventing dehydration and weight loss in newborns (Paul, Phillips, Widome, & Hollenbark, 2004).

Geiger et al. (2001) examined whether re-hospitalization for jaundice in newborns was associated with the length of hospital stay after birth and to identify risk factors of re-hospitalization for jaundice in infants who were normal at birth. This study, performed in a population of Kaiser Permanente patients who gave birth at Kaiser Medical Centers, provides results that are difficult to generalize to patients who receive care in a health system that is not integrated. The data for the claims were taken from over 68,000 women with vaginal deliveries in the Southern California Kaiser system from 1992 to 1994. The results showed that 31% of Hispanics and 4% of African-Americans were re-hospitalized for jaundice less frequently than 47% of Caucasians. Other risk factors for re-hospitalization were primiparity (a first pregnancy), premature or prolonged rupture of membranes, preterm birth (< 38 weeks gestation), and breastfeeding during hospitalization. The study did not find an increased risk for re-hospitalization for those infants discharged less than 24 hours after birth. These data support the need for postpartum follow-up among a wide range of

risk factors. They also support the fact that breastfeeding is a risk factor for newborn readmissions and breastfeeding mothers may be considered at higher risk.

Hyperbilirubinemia has become an issue for hospitals in the U.S. due to a recent increase in reported cases of kernicterus. Kernicterus is a form of brain damage caused by excessive jaundice. As a result there has been a surge in the number of litigation cases concerning kernicterus (Gale, Seidman, & Stevenson, 2001). Early postpartum discharge in the absence of adequate follow-up care has been implicated by several reports of kernicterus. Kernicterus was unreported in the U.S. until the late 1990s, when more than 40 cases appeared among healthy term infants (Gale et al., 2001). The concern that kernicterus may be associated with severe hyperbilirubinemia has caused AAP to modify policies of discharge and follow-up care (AAP, 2004). Appropriate medical care in a safe and cost-effective way remains the ultimate goal; therefore all infants discharged within 48 hours must be examined again 48 to 96 hours post discharge.

Jaundice occurs in most newborn infants. Most jaundice is benign, but because of the potential toxicity of bilirubin, newborn infants must be monitored to identify those who might develop severe hyperbilirubinemia and, in rare cases, acute bilirubin encephalopathy or kernicterus. In 2004, the AAP developed new guidelines for the management of hyperbilirubinemia with the purpose of minimizing the risks of unintended harm such as maternal anxiety, decreased breastfeeding, and unnecessary costs or treatment. Although kernicterus should almost always be preventable, cases continue to occur (AAP 2004).

Datar and Sood (2006) examined the impact of postpartum hospital stay legislation on newborn length of stay, neonatal readmissions, and 1-year mortality in California. Their results revealed that the legislation was associated with an increased length of stay among births in California with a significant decline in neonatal readmissions but not in 1-year infant mortality. This indicates that women who stayed in the hospital longer were less likely to have their newborn readmitted to the hospital but had little impact on the infants at risk for mortality.

The needs of mothers and infants have not changed with shortened hospital stays yet many of these needs are now unmet inside the hospital. These unmet needs often include a thorough risk assessment of support systems available to the mother when she is discharged (Gaffney & Altieri, 2001). Coordination of follow-up care with in-patient maternity services is a critical component to providing a quality postpartum follow-up program. Early discharge has been found to be a safe practice when followed by postpartum support. The risks of newborn readmissions are decreased when early discharge is followed by effective postpartum follow-up (Apgar, 2007).

D. Psychosocial Support

Psychosocial issues are part of a growing trend in which patient satisfaction, communication of information and practitioner concern for patients as individuals are critically important indicators of quality medical care (Rankin, 2000; Namiye et al., 2007). Despite extensive innovations and advancement in medical care, the majority of patient complaints stem from poor communication skills of healthcare professionals (Fallowfield, 1999). Rankin demonstrated the importance women with breast cancer

attach to psychosocial issues, based on results from a self-report survey mailed to women diagnosed with breast cancer. Twenty-eight (54%) of the 52 issues on the survey were rated as essential in providing adequate psychosocial care. Among the top items were the provision of information and choice and effective communication with medical professionals.

Naessens, Baird, Van Houten, Vanness, and Campbell (2005) found that many persistently high primary care users appear to be over-serviced but underserved, with underlying problems not addressed by those following the traditional medical approach. Some patients may benefit from psychosocial support, whereas others may be good candidates for disease management interventions. Risk factors associated with high primary care use were chronic medical instability, limited psychosocial time with healthcare providers, and minor signs and symptoms. The results showed that only 2% of the patients consumed a large share of total primary care visits and that those patients persisted in their relatively high use for 2 years. Patients with high utilization either were experiencing a chronic disease or had relatively minor conditions and lacked clinical or managed care relevance. The researchers speculated that patients with minor conditions were experiencing stressful conditions with little social support and cited the need for additional research to test their hypothesis. Furthermore, the researchers concluded that high and persistent primary care users had psychosocial issues that were not being addressed. These patients were seeking medical attention for non-medical issues or minor health concerns. Although this population and the setting may be different than postpartum patients, the evidence supports the idea that unmet

psychosocial needs manifest in physical symptoms requiring medical attention and utilize unnecessary healthcare resources.

Surkan, Peterson, Hughes, and Gottlieb (2006) examined the relationship between social support networks, and the symptoms of depression in a multiethnic sample of women having recently given birth. They found that women who reported having two or more friends or family members showed notably fewer depressive symptoms. Their study found that both social networks and social support were independently and inversely related to depressive symptomatology.

Cohen (2004) reviewed evidence showing that three social construct variables reliably influence physical health. The three constructs included social integration, social support, and negative interaction. Each of these variables appears to influence health via different mechanisms and are not necessarily attributable to personality. The three mechanisms that support these social constructs are stress buffering for social support, main effect for social integration, and relationships as a source of stress for negative interactions. The construct of social support was stress buffering by eliminating or reducing effects of stressful experiences by promoting less threatening interpretations of adverse events and effective coping strategies in the event of a stressful situation. Social integration, defined as participation in a broad range of social relationships, promotes positive psychological states which provide information and a source of motivation and social pressure to care for oneself regardless of stress experienced. Negative interactions elicit psychological stress and cause behavioral or psychological angst that increases the risk for disease. Cohen argued that these social

variables were associated with health outcomes through different mechanisms, and were not dependent upon a particular personality, making them subject to intervention. New mothers provided psychosocial support in postpartum programs may not only experience social pressure to adequately care for herself and infant, but interpret her current situation as less threatening and more likely to acquire effective coping skills. Social support provided by healthcare providers in a postpartum program may provide an effective stress buffering mechanism reducing perceptions of stressful situations and improve breastfeeding patterns for new mothers.

In related research, Cacioppo et al. (2002) examined four possible mechanisms by which loneliness may have detrimental effects on health: health behaviors, cardiovascular activation, cortisol levels, and sleep. The first study assessed these mechanisms in 89 undergraduate students selected from the top and bottom quintile of the UCLA-R loneliness scale. In a second study, they recruited 25 older adults by mail from a condominium in Chicago. Both studies measured self-reported loneliness and conducted lab tests and physical assessments to analyze the relationship between loneliness and health. The researchers concluded that lonely participants had higher peripheral resistance and poorer sleep patterns than non-lonely individuals. Health behavior and cortisol regulation did not appear to have a significant difference between the two groups but the authors cautioned that more sensitive measures and larger sample sizes may be required to discern their roles in loneliness. The results support the possibility that feelings of loneliness may, over time, lead to diminished health and well-being. New mothers often feel isolated and lack sufficient social interactions in

the critical time following childbirth (Beck et al., 1992). Coupled with hormonal changes and potential difficulties in breastfeeding in postpartum, loneliness may contribute to a decrease in overall health and well-being of the mother.

Psychosocial support is increasingly being identified as a key factor in improved health. Increased utilization of healthcare resources may result in a lack of adequate psychosocial support. With continued efforts to reduce costs in health care and improve quality, the provision of psychosocial support by healthcare providers may be an alternative for cost savings.

E. Lack of Timely Follow-Up Care

In response to the reduced hospital stays for childbirth, the AAP recommended that newborns receive follow-up care in the office or home within 48 hours of a short stay in the hospital. These recommendations were based on clinical concerns that include breastfeeding promotion and timely detection of jaundice that may not manifest during the first 2 days of life. A short stay or early discharge is defined as a post-delivery stay of less than 48 hours for a vaginal delivery and less than 96 hours for a cesarean section. Additionally, 43 states responded to the widespread concern of early discharge, with California being one of the leaders. In 1997, the California Newborns and Mothers Health Act of 1997 (NMHA) mandated coverage of home or office follow-up for early discharged infants when the visit was prescribed by the physician. Physicians will prescribe home visits for low-income patients or teens but not on a routine basis.

Galbraith et al. (2003) examined newborn length of stay and follow-up care in California following the enactment of the legislation. In 1999, the California Maternal and Infant Health Assessment obtained data from a population-based survey of postpartum women. The findings indicate that 44.2% of newborns born vaginally and 71.4% of all cesarean births were discharged early. Their findings also indicate that most newborns discharged early did not receive timely follow-up care. Only 32.5% of newborns discharged early had follow-up within the recommended 2 days of discharge and 44% had received no follow-up within 1 week of discharge. The researchers adjusted for other variables and found that untimely follow-up was more likely among those with incomes \leq 100% poverty level, Medicaid coverage, Latina ethnicity, and non-English language. Untimely follow-up was less likely if the mother was 18-19 years old. This study suggests that adequate follow-up care following delivery is not a standard of care for early discharged patients. This lack of standardization and recommendations from literature may be a significant problem in the effective implementation of routine postpartum follow-up care.

F. Successful Postpartum Programs

The tendency for early discharge is unlikely to be reversed due to the rising costs of health care. Proper postpartum medical attention in a safe and cost-effective manner is critical for the well-being of infants.

Guise, Palda, Westhoff, Chan, Helfand, and Lieu (2003) performed a meta-analysis to systematically review whether primary care based interventions improved initiation and duration of breastfeeding. This review included a thorough review of

MEDLINE (1966-2001) and included 30 randomized and nonrandomized controlled trials and five systematic reviews of breastfeeding counseling. The researchers found that in-person educational support programs had the greatest effect of any single intervention on both initiation and short term breastfeeding duration. Support programs conducted by telephone, in person, or both also increased short-term and long-term breastfeeding duration. In contrast, provision of written materials, such as pamphlets, did not significantly increase breastfeeding. There was insufficient data to determine whether the combination of education with support was more effective than education alone. Psychosocial support is an indicator for the initiation and duration of breastfeeding and should be assessed during postpartum programs. Social support has been effective in reducing the effects of stressful events if the form of support matches the demands of the event (Cohen & Wills, 1985). The postpartum period is stressful enough for women without the challenge of breastfeeding difficulties. The psychosocial support provided by healthcare providers in the postpartum period may be a critical link in establishing successful breastfeeding.

Shaw et al. (2006) systematically reviewed the literature on postpartum care to determine the effectiveness on postpartum programs. The researchers did not find evidence to endorse universal provision of postpartum support for the improvement of maternal parenting, mental health, quality of life, and physical health, although they did find some evidence that high risk populations may benefit from postpartum support. The postpartum programs that addressed high risk populations may have a stronger psychosocial component, making them more effective in improving physical health.

Other universal postpartum programs may be limited in their scope of services and may not address the critical psychosocial needs of new mothers, therefore missing the key factor of an effective program.

Goulet, Fall, D'Amour, and Pineault (2007) found that an effective coordination between community-based perinatal services and hospital-linked home phototherapy was a critical component for reducing the costs of newborn readmissions while focusing on the needs of the mothers and newborns. Home phototherapy for neonatal jaundice is a treatment that involves continually applying ultraviolet light by means of a lamp to an infant in the home for a prescribed period of time. Application of the ultraviolet light helps reduce elevated bilirubin levels, which can cause brain damage in the infant. The integrated network of community-based services was an essential condition for improved monitoring for both mother and baby. Interventions that provided essential support for new parents and more specifically a stronger and more systematic linking of services offered by both the hospital and community organizations were found to minimize the risk of jaundice. The coordination of community support services was an essential component as it not only improved the monitoring of jaundice but it fostered a follow-up that focused on the mother and newborn needs.

In a study by Beck et al. (1992), postpartum maternal concerns were most often associated with maternity blues, postpartum depression, and emotional issues. Postpartum visits following early discharge are not only an opportunity to identify health issues of newborns and concerns of mothers but present opportunities to make

referrals to appropriate care providers. According to the Office of Statewide Health Planning and Development in California, the leading cause for hospitalizations in 2002 for children 5-14 years in San Bernardino County was depression. Cohen et al. (2005) found that maternal depression occurring after birth was associated with an increased anti-social behavior in children by 7 years of age, and that the combination of depression and anti-social personality disorders posed the greatest risk for children's behavior. Postpartum distress is rarely detected in routine postpartum visits and psychosocial interventions may prove to be beneficial in improved detection (Ferguson, Jamieson & Lindsay, 2002).

In a cost conscious healthcare environment it is important to understand what components of postpartum programs are most effective. Keppler and Roudebush (1998) examined an innovative model of postpartum follow-up care found to be cost-effective. The program was unique in that it complemented routine physician visits. The clinic was staffed with lactation nurses and the décor of the room was more homelike with comfortable large chairs, rocking chairs, breastfeeding pillows, and artwork. It allowed one nurse to see more patients as a family in a clinic than could be seen in a home visit. The authors found that in the clinic they were evaluating, the readmission rates did not increase despite shorter maternity stays when supplemented with the follow-up program. The costs of the program were covered by families who participated in the prenatal classes, third-party payers, and the hospital foundation. The evaluation of this hospital-based clinic was largely qualitative with little quantitative substance, but it is a program worthy of observation and further evaluation. Future

research will need to determine if successful postpartum programs can ensure the safety of both mother and infant with early discharge.

G. Cost-benefit Analysis and Newborn Readmissions, and Health Education

Follow-up visits are associated with a significant reduction in the need for subsequent hospital and emergency department services for jaundice and dehydration in the newborn (Paul, Phillips, Widome, & Hollenbeak, 2004). Both emergency department visits and in-patient beds are in high demand making measures to reduce the utilization for these services imperative. Health educators not only need to provide continued support for their services but need to market effectively the benefits of their services in reducing hospital utilization, lowering costs, and improving quality. Unfortunately, in the past, effective measures have shown decreased utilization but the cost savings were often not incurred by the bottom line expending the resources. If hospital newborn readmissions are reduced in a community hospital that is independent of the health plan or medical group, the cost savings would not be incurred by the hospital. Therefore the incentive to provide preventive services by the hospital has not been present. This study evaluates the cost-benefit of a health education program while examining its quality, making the results useful to both health educators and health administrators. Cost-benefit analysis (CBA) assigns dollar values to costs and benefits to determine whether the benefits realized exceed costs for a particular program. Benefits are assigned a monetary value and indicate whether a specific strategy results in a net gain or net loss. Results of a CBA are expressed as net benefits (benefits minus costs) and used in comparing a range of activities with dissimilar measures of outcome

(Graham, 2003). This information helps decision-makers select among various programs or among different strategies within a program.

Preventing newborn readmissions may present a cost-benefit in the short term for health plans paying for health services, but the benefits of psychosocial support provided by healthcare professionals during the postpartum period may be beneficial to society beyond cost analysis. A CBA may not include indirect benefits such as a decrease in hospitalization costs for childhood depression or childhood obesity that may be prevented from breastfeeding. Unfortunately, most CBAs are not commensurate with the size, complexity and cost of postpartum programs (Graham, 2003).

Paul et al. (2004) performed a retrospective analysis of a financial database in a hospital of the discharge data and follow-up care for babies born at a single center from 2000–2002. The financial data included reimbursement values and costs of care from the payers perspective at the center. The researchers performed a deterministic cost-effectiveness analysis using a decision tree. The costs of the nursing visit were not included because these costs were absorbed by the insurance companies. The limitation to this study was the inability to obtain data on newborns admitted to other hospitals. On the basis of the probabilities at this center and the average costs associated with each health condition, the expected cost per child who received a home visits was \$109.80 compared with \$118.70 for each newborn that did not receive a home visit. The cost-effectiveness ratio of the home nursing visit strategy compared to no home visitation was \$181.82 showing a significant cost savings for home visitations. The researchers for this study concluded that payers will save \$181.82 for every additional

child who does not use hospital services in the first 10 days of life. Postnatal home nurse visitation seems to be a highly cost-effective intervention for payers, based on these findings. The limitations of this study would include the exclusion of other benefits of breastfeeding success, parental confidence, and convenience of care that are not calculated into the benefit of reduced readmissions and emergency department days.

An important factor in determining cost savings in the healthcare system is the fact that savings to the payers or health insurance companies does not translate to a cost savings to the providers. Although insurance companies may expend dollars on readmissions and emergency department visits, the providers make money on hospital utilization, creating a disincentive for prevention strategies.

H. Conclusion

The literature supports health benefits to providing postpartum care to new mothers but lacks evidence supporting the value of psychosocial support in terms of normal newborn readmissions and costs. There is little elucidation of the specific mechanisms to explain improved health outcomes in the postpartum period resulting from comprehensive psychosocial support. Programs offering breastfeeding support, health promotion and education, social assessments, and referrals to appropriate agencies for new families are most effective (Altieri, 2001; Frank-Hanssen et al., 1999; Keppler et al., 1999). Although there is a large body of evidence for the benefits of social support, there is limited research identifying varying levels of psychosocial support from healthcare providers in postpartum programs.

Research should include the health benefits of programs if they were to provide psychosocial support to new mothers. The high rates of children hospitalizations for mental disorders in San Bernardino County may be an indicator that psychosocial issues for mothers and infants are being overlooked in routine screenings and manifesting in advanced stages requiring hospitalization (Office of Statewide Health Planning, Discharge Data, 2005). With growing concerns about the rising costs of health care, it would behoove the medical and public health community to develop and implement postpartum programs that complement traditional physician visits. A multidisciplinary approach to postpartum follow-up could include nurses, lactation consultants, and social workers following new families to address the varied needs of new mothers. The current literature available on the ways in which approaches to routine postpartum care affects outcomes is limited. Studies of adequate design are needed to examine routine postpartum care. Until then, no single model of postpartum services can be defined as a "best practice." The American Academy of Pediatrics has recommended guidelines that postpartum visits should occur (Paul et al., 2004) but due to a lack of research, there are no accepted standards for addressing the follow-up needs of mothers and infants. My research assessed the impact of psychosocial support from healthcare professionals on health outcomes.

Cost-benefit analyses are rarely considered in formal decision making for public health and medical guidelines (Graham, 2003). This decision analysis tool offers a valuable approach to decision making in both the private and public sector because it identifies any cost-benefits associated with implementing programs. As healthcare

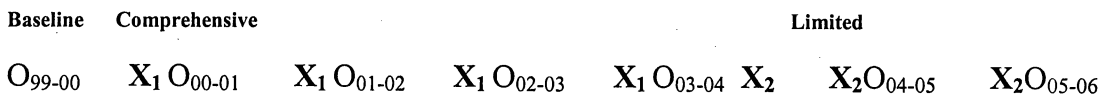
costs continue to increase, research which includes cost analysis can offer evidence of cost savings for health policy makers.

CHAPTER 3

METHOD

A. Study Design

This study relied on an interrupted time series design with a partial reversal of the intervention. The study included a retrospective analysis of a secondary dataset of normal newborn readmissions at San Antonio Community Hospital (SACH), located in the Inland Empire of Southern California, and involved comparisons across three time periods: (a) *baseline*, the year prior to the onset of a psychosocial intervention for new mothers and babies (1999-2000); (b) the 4 years during the *comprehensive* intervention (2001-2004); (c) and 2 years post-intervention during a *limited* intervention (2004-2006). The data were collected in fiscal years beginning July 1 and ending June 30 of each year. A diagram of the design is:



B. Background and Overview of Intervention

SACH established the Family Care Center (HBFCC) in November 2000 with funding from a grant from the tobacco tax initiated in California in 1998. The HBFCC was created in the SACH Maternity Department, in response to a higher than expected newborn readmission rate of 2.9% in 1998 (94 normal newborn re-admits to 3,572 births), shorter maternity hospitalizations (less than 24 hours for vaginal births), and a lack of postpartum follow-up. The comprehensive program offered support to new families in the form of developmental assessment and intervention, breastfeeding,

infant and toddler nutrition, health promotion and education, and referrals to appropriate agencies when indicated. As a part of the FCC, support services were offered to mothers through a Walk-In Breastfeeding Clinic that provided psychosocial support from lactation consultants, nurses, and social workers to new mothers in a non-threatening relaxed environment. This process, approached from a multidisciplinary perspective, incorporated one-on-one teaching, and the use of anticipatory guidance with regard to developmental milestones and health education. The assessment began in the hospital, prior to discharge, with a visit by a FCC nurse, and then the mothers received a phone call 24 hours after discharge encouraging them to visit the FCC. All family members who attended the center visit, or who were present during the hospital or home visit, were included in this process. This environment allowed for a thorough assessment of psychosocial issues that not only affected the mother but the entire family. The comprehensive intervention was staffed with registered nurses, lactation consultants, and social workers.

The FCC was intended to complement the physician visits, and services were offered through telephone follow-up, home visits, and center visits. Mothers were given a psychosocial risk assessment during the visit. Clients unable to access services at the centers were scheduled for a home visit. Less than 15% used home visitations. In addition to weekday hours, nurses were available on Saturdays for in-hospital visits and telephone contacts. All teen mothers received a home visit to better accommodate their special needs. An International Board Certified Lactation Consultant (IBCLC) staffed a walk-in breastfeeding clinic three mornings per week. The mother's mental

and physical well-being were screened during the assessment, with a special emphasis on postpartum distress and other psychosocial issues.

In 2004, when the grant funding was discontinued, the intervention was reduced to breastfeeding support in newborn feeding centers. These centers were staffed with lactation educators, offered three mornings per week with no appointments necessary. The centers offered minimal psychosocial support from healthcare providers but were a source of social support from other new mothers. Mothers received lactation support in group settings, therefore limiting fathers' involvement. In this research this is termed the "limited intervention." The multi-disciplinary team was not available during this time period C (2004-2006).

The baseline data was taken from the year 1999-2000 when the postpartum psychosocial support intervention was not available.

C. Participants

Participants included normal newborn births labeled with a Diagnosis Related Group (DRG) of 391 from July 1, 1999-June 30, 2006. Data from births before 36 weeks gestation or newborns admitted to the Neonatal Intensive Care Unit (NICU) following birth were excluded from the study and not included in the normal newborn readmission rates. The normal newborn readmission rates were compared to a *baseline* in 1999-2000 in the absence of the intervention (time period A), during the *comprehensive* intervention from 2000-2004 (time period B), and with the *limited* intervention from 2004-2006 (time period C).

D. Variables

The dependent variables for this study were normal newborn readmission rates, readmission DRGs, multiple readmission rates, and costs affiliated with normal newborn readmissions and interventions for each time period. Normal newborn readmissions were defined as a newborn being readmitted into the hospital in which they were born within 28 days of birth. These data were collected from the hospital readmission database and the Family Care Center (FCC) database and includes readmissions for FCC participants and those patients receiving the intervention. The dataset for the FCC was not integrated within the hospital in-patient dataset and was required to identify those patients receiving the intervention.

The independent variables for this study were the FCC intervention, and diagnosis related group (DRG). The variables of ethnicity, age of mother, number of births, gravida, payer type at birth, and charges affiliated with the readmission were available for the limited intervention only. There were two levels of the intervention: (1) time period B from 2000-2004, during which mothers and infants received the *comprehensive* intervention from a team of healthcare providers, including a registered nurse, lactation consultant, social worker; (2) and time period C from 2004-2006, during which mothers and infants received the *limited* intervention. These dependent variables for these two interventions were compared to the baseline data from time period A for fiscal year 1999-2000.

E. Data Collection and Abstraction

Newborn readmission data were collected from the in patient hospital discharge data and matched with the information in the Healthy Beginnings Access Database (HBAD), a database containing data from assessment tools given to mothers between 3 and 14 days following delivery. The computerized data also contained the mother's medical record number which was purged after matching to readmission and intervention data. The database for this research identified which mother and infant received the FCC intervention and during which study time period. Additional data for all live births and newborn readmissions from the hospital's computerized discharge records were then transferred into an Excel database. Additional demographic data on the characteristics of the mother and newborn was collected to determine if there are differences between those who participated in the intervention and those who did not. The variables included: a randomly identified patient number, date of birth, readmission date, diagnosis related group (DRG), payer type at birth, breastfeeding status at readmissions, and charges affiliated with the readmission. Demographic data were available for only the limited intervention and included ethnicity, age of mother, language, feeding type in the hospital, smoking status, number of births, and gravida. The data were then transferred by a hospital employee into the following databases to ensure patient confidentiality. Permission to access the data was granted from SACH Internal Review Board (IRB) committee.

1. Data Collection Process

The following was how the data was collected from the various databases at the hospital, merged into one file and de-identified for analysis:

1. Hospital Computerized Discharge Records Database (HCDRD)- This was a specialized database which tracks admissions and discharges. The charges affiliated with newborn readmissions were included in this database. The admission and readmission were extracted from this database and transferred into an Excel database.
2. Live Births Readmission and Charges Database (LBRCD)- This was an Excel spreadsheet created from the HCDRD. This database contained the mother's medical record number, date of birth, date of readmission(s) of newborn, readmission DRG, and charges incurred during the readmission. This was a temporary file. I developed a template for the database, and then a hospital authorized employee with access to medical records transferred the data into the database.
3. Identified Database (ID)- This was a database built by matching the HBAD and LBRCD by the medical record number. After receiving permission from SACH, a random number was assigned to each record to serve as a link to de-identify the data in the next step. This was a temporary file and was housed at SACH.
4. Linking Database- This database contained only the mother's medical record number and the random linking number. This file was password

protected and kept only at San Antonio Community Hospital, only employees with access to patient medical records had access to this database.

5. De-identified database- This file contained all data from the ID except the mother's medical record number. Once this file was created and checked for accuracy, outliers, and incomplete data, the LBRCD and ID were destroyed. This file was used at sites away from San Antonio Community Hospital.

Additionally, the costs of the intervention were calculated as part of the cost-benefit analysis. All normal newborns born between July 1, 1999 and June 30, 2006 were included in the analysis. A simple cost-benefit analysis was performed across time periods A, B, and C by comparing costs for normal newborn readmissions to the costs of the intervention. The costs of the intervention were determined by the actual cost of the program which was carefully tracked due to grant funding. Costs of the intervention were well documented by hospital staff due to the requirements of the funding agency but included costs up to the 2-year follow up well beyond the 28 newborn days. The costs for the newborn period consisted of 40% of the budget and costs of the intervention were calculated accordingly. The costs of the intervention for the baseline time period A did not include any intervention costs. Unfortunately, the financial value of intangible benefits, such as a decrease in family stressors that occur due to newborn readmissions, were not factored into the analysis because of the subjective nature of improved health and well-being.

F. Data Analyses

Newborn readmission rates for the baseline measurement (time period A) were compared to the newborn readmissions during the comprehensive intervention (time period B) and during the limited intervention (time period C). Analysis included a comparison group of three time periods: time period A was *baseline* 1999-2000; time period B was the *comprehensive* intervention (2000-2004); and time period C was the partial reversal or *limited* intervention (2004-2006). A graph was developed to examine yearly intervals for incidence of readmissions to account for possible variations due to the implementation period and phasing out period for the comprehensive intervention. Chi-square analyses were conducted to determine if normal newborn readmission rates were lower among mothers who received the comprehensive psychosocial support intervention compared to baseline or the limited intervention time periods.

The characteristics of the mothers such as age, ethnicity, smoking status, language, feeding type in the hospital, para, and gravida in the limited intervention were analyzed to identify if the participants of the limited intervention differed from the non-participants. Unfortunately comparable data were not available for those in the comprehensive time period.

A CBA was performed to compare the costs of the intervention to the costs for normal newborn readmissions to quantify whether the average cost per patient for the intervention differed across study time periods and for those who received the intervention. The cost-benefit analysis compared costs for both time periods of the interventions to the costs for the baseline readmission data in 1999-2000. The costs of

the intervention were calculated based upon the program budget and the number of patients and visits in each fiscal year. Due to this program being grant funded the costs affiliated with the intervention were carefully calculated for each time period. The CBA included the charges affiliated with each readmission for each time period and the costs of the intervention at each time period. In addition to the CBA one-way ANOVA was conducted to identify if there was a statistical difference in average costs per newborn across all three time periods and within the intervention time periods for those who received the intervention verses those who did not.

G. Power Analysis

This study was a retrospective analysis. The sample size was determined by the number of births at San Antonio Community Hospital during the three time periods (A, B, and C) of the study. The analyses included 14,786 births and 225 readmissions across the three groups. The baseline group prior to the intervention included 2,738 births and 62 readmissions (time period A); the comprehensive intervention group included 8,288 births and 79 readmissions (time period B), and the limited intervention included approximately 3,760 births and 84 readmissions (time period C). A Chi-square analysis was performed utilizing a power of .80 based upon a medium effect size and an alpha of .05. The sample sizes for each time period were slightly under the requirements of $N=392$ according Cohen's table for power analysis (Cohen, 1992). Although this study had a large sample size for births the newborn readmissions were only $N=225$ across all three time periods.

H. Research Ethics

All data collected for this study were de-identified as described previously and aggregated to ensure patient confidentiality. Careful consideration was given to the data abstraction and collection process to ensure that all information was kept confidential. All data taken from SACH were de-identified and password protected.

Although this study was performed retrospectively, the data collection process was originally designed with the intent for of future analysis. To accommodate for the fact that many mothers did not have the time to read cumbersome paperwork, the contents of the consent form were bulleted and verbally discussed with the mother before she was asked to sign the form provided in Appendix B. This program was a part of the hospital's routine quality assurance program and specific consent for de-identified data utilization was not necessary.

Careful attention was given to any mother who had apprehension regarding having her data collected for the program evaluation. A protocol was in place for staff to assure new mothers they had the right not to be included in the data collection if they felt any apprehension. All normal births and newborn readmissions from 1999–2006 were included in this study. No one was included in the analysis unless the mother specifically requested her data to be excluded from the program dataset. During the time periods B and C no one requested that their data be excluded.

CHAPTER 4 – PUBLISHABLE PAPER
POSTPARTUM FOLLOW-UP: IS PSYCHOSOCIAL SUPPORT THE
MISSING LINK?

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Callouts:

1. There are social implications to the birthing and parenting process that go beyond the biomedical model.
2. A higher degree of psychosocial support provided in the postpartum period may be associated with a greater reduction in normal newborn readmissions.
3. Post partum programs should include strong relationships with service systems that provide social as well as health-focused services
4. Breastfeeding support was an important component of a postpartum program but may not be sufficient for reducing normal newborn readmissions.
5. Including the fathers in the educational process and offering psychosocial support as a family unit may be an important component in a post partum program.

Key Words: Postpartum follow-up,
social support, newborn readmissions, cost-benefit

POSTPARTUM FOLLOW-UP: IS PSYCHOSOCIAL SUPPORT THE MISSING LINK?

Abstract

Purpose. The purpose of this study was to determine if there was a relationship between postpartum psychosocial support from healthcare providers and the rate of normal newborn readmissions and whether there was a cost-benefit to justify an intervention.

Study Design and Methods. Data were abstracted for all normal newborn births from 1999-2006 (N=14,786) at a community hospital in southern California: at *baseline* prior to any intervention for new mothers and babies (1999-2000), the 4 years during the *comprehensive* psychosocial support intervention (2001-2004), and 2 years during a *limited* psychosocial support intervention with breastfeeding support only (2004-2006). A cost-benefit analysis was performed to analyze whether the financial benefits from the intervention matched or exceeded the costs for normal newborn readmissions.

Results. There was a significantly lower readmission rate of 1.0% ($p = < .001$) during the comprehensive time period compared to baseline (2.3%) or to the limited psychosocial support intervention time period (2.3%). While there was no significant difference in the average cost per newborn readmitted across the three study time periods, during the comprehensive intervention time period, the average costs of a normal newborn readmission were significantly lower (\$4,180, $p = .041$) for those who received the intervention compared to those who did not (\$5,338). There was a cost-

benefit of \$513,540 due to fewer readmissions during the comprehensive psychosocial support time period but it did not exceed the cost of the intervention attributed to care in the first 28 days postpartum (\$1,183,600).

Clinical Implications. Providing comprehensive follow-up for new mothers in the postpartum period can reduce normal newborn readmissions thus lowering the average newborn readmission costs for those who receive psychosocial support.

Introduction

With the current economic realities facing healthcare, effective and comprehensive maternity care is becoming an increasingly difficult challenge for birthing hospitals (Borger, 2006). Currently there are over four million births per year in the U.S., making childbirth the most common cause of hospitalization (Paul, Phillips, Widome & Hollenbeak, 2004). These hospitalizations come at a significant cost and attempts to reduce these costs have resulted in numerous efforts over the past two decades aimed at reducing postpartum length of stay. Shortened hospitalizations for mothers and infants have become a trend in the healthcare industry with women and their infants being discharged as soon as 24 hours after giving birth, leading to a lack of proper postpartum care (Galbraith, Seidman & Stevenson, 2003). The most common reason for newborn readmissions to the hospital after early discharge is neonatal jaundice. Postpartum follow-up after discharge from the hospital provides an effective means of reducing jaundice (Goulet et al., 2006; Gale et al., 2001; Geiger et al., 2001; Blackwell, 2003).

Researchers have predominantly focused on the importance of routine postpartum care following early discharge with minimal recommendations or support for health promoting activities for the mother and infant or the development of strong relationships with service systems that provide social as well as health-focused services (Galbraith et al., 2003). Research, policy, and legislation have concentrated primarily on the number of hours of postpartum hospital stay, rather than on the needs of the mother and newborn or on the content and quality of the care they receive. This focus

reflects the limitations to the measures of effectiveness and quality of postpartum programs.

Postpartum education and psychosocial support in the hospital are often overlooked because other essential functions such as monitoring and support to ensure infant stabilization, recommended immunizations, mandatory screening for genetic disorders, and assessment of major medical risk factors must be performed during the short hospital stay (Martines et al., 2005). The needs of mother and baby in the postpartum period are not only physical but also have a significant emotional component (Guise et al., 2003). To provide only physical assessments and treatment neglects the psychological and social factors (psychosocial) impacting a newborn and mother. With technical advancements, the medical community often dismisses the value of psychosocial support in treating patients. Rarely does one see postpartum programs based on traditional medical models emphasizing the importance of psychosocial support (Eaton, 2001). There is a lack of information on the effectiveness of psychosocial support which is needed to convince the medical community to integrate such support into their traditional medical models of postpartum care (Shaw, Levitt, Wong, & Kaczorowski, 2006).

We examined normal newborn readmission rates for time periods involving two different levels of psychosocial support by healthcare providers during the postpartum period and compared them to a baseline rate. The two levels of psychosocial support are defined as the limited and comprehensive intervention time periods. The comprehensive intervention offered developmental assessments,

intervention, breastfeeding support, health education and referrals to agencies when needed. The limited intervention offered breastfeeding support only.

A cost-benefit analysis was performed to compare the costs of the intervention to the costs for normal newborn readmissions across the three study time periods. The costs of the comprehensive and limited interventions quantified whether the cost per patient enrolled in the intervention equated to a savings in healthcare dollars in terms of readmission costs.

Study Design and Methods

Setting. The data were abstracted from the Family Care Center (FCC) program located in a private not-for-profit hospital. The FCC program was established in November 2000 with funding from the voter initiated Proposition 10 tobacco tax in California. The FCC was created in the Maternity Department in response to a higher than expected newborn readmission rate of 2.9% in 1998 (94 normal newborn re-admits per 3,572 births), shorter maternity hospitalizations (less than 24 hours for vaginal births), and a lack of hospital based postpartum follow-up. The comprehensive psychosocial support program, referred to as the “comprehensive intervention,” offered support to new families in the form of developmental assessment and intervention, breastfeeding, infant and toddler nutrition, health promotion and education, and referrals to appropriate agencies when indicated. All family members were included in the intervention. Prior to discharge, every mother received a visit from a FCC nurse explaining the program and a phone number to call if the mothers had any questions.

All mothers were given a phone call by a nurse 24 hours after discharge to schedule an appointment at the FCC. The FCC staff identified breastfeeding support as a critical component of the comprehensive intervention that should be sustained in future postpartum programs. Overall utilization of the support services during the comprehensive time period was 30% of the births, but during the last year of the comprehensive intervention the utilization rate reached 46% as shown in Figure 1.

In 2004, when funding was significantly reduced, a limited intervention consisting of breastfeeding support was sustained through the hospital and other grant funding. This intervention was staffed with lactation educators and offered support three mornings per week with no appointments necessary. Social support came primarily through other mothers visiting the center, with limited psychosocial support from healthcare providers. Mothers received lactation support in group settings, which limited the father's involvement. In this study, this is termed the "limited" intervention, meaning limited psychosocial support. The overall utilization rate for the limited intervention was 50% with an increased utilization of 62% in 2006.

Design. This study relied on an interrupted time series design with a partial reversal of the intervention utilizing a retrospective analysis of a secondary dataset of normal newborn readmissions at SACH. The analyses involved comparisons across three time periods: (1) *baseline*, the fiscal year prior to the onset of a psychosocial intervention for mothers and babies (1999-2000); (2) *comprehensive*, the 4 fiscal years during which the comprehensive intervention was offered (2000-2004); and (3) *limited*, the 2 fiscal years during which the limited intervention was offered (2004-2006). The

data provided by the hospital finance department were summarized in fiscal years July 1 – June 30, to coordinate with the funding cycle of the grant and to make appropriate cost comparisons across the study time periods.

Participants. Participants included normal newborn births labeled with a Diagnosis Related Group (DRG) of 391 and classified as a normal newborn from July 1, 1999 through June 30, 2006. Data from births ≤ 36 weeks gestation or newborns admitted to the Neonatal Intensive Care Unit (NICU) following birth were excluded from the study, and thus not included in the newborn readmission rates. Normal newborn readmissions are defined as a newborn being readmitted into the hospital in which they were born within 28 days of birth (Office of Statewide Health and Planning Department, 2008).

Data Collection and Abstraction

Live birth and normal newborn readmission data were abstracted from the database collected by the SACH finance department and from the FCC database. The data from finance were merged by FCC staff and researcher at the hospital utilizing the patients' medical record numbers with the FCC data. Additional demographic characteristics of the mother and newborn were only available for the limited intervention time period and were abstracted from the FCC database to determine if there were differences between those who participated in the intervention during that study period and those who did not. Comparable data for the comprehensive time period was not available because demographic data were not collected on all deliveries

and the demographic data for those utilizing the FCC were not retained in the database when the limited intervention began in 2004.

Data Analyses. Newborn readmission rates during the baseline period were compared to the newborn readmissions during the comprehensive and the limited intervention time periods. The analyses included 14,786 eligible births across the three groups. The baseline group prior to any intervention (1999-2000) included 2,738 births; the comprehensive intervention group (2001-2004) included 8,288 births with an average of 1,893 births per year, and the limited intervention (2004-2006) consisted of 3,760 births with an average of 1,880 births per year. One normal newborn readmission in the comprehensive time period was deleted from the analyses due to a missing charge for normal newborn readmissions. Within each of the two intervention time periods, chi-square analyses were conducted to determine if the normal newborn readmission rates were lower for mothers who received the intervention compared to those who did not. The utilization patterns for the intervention were also calculated for each year to examine if there were variations and account for start-up times for each intervention.

A two-way ANOVA was performed to identify if there was a statistically difference in the average cost per normal newborn readmission across the three study time periods (baseline, comprehensive, and limited) and for those who did versus did not receive the intervention. The cost-benefit analysis computed the total costs of the program and compared them to any benefits seen for reduced normal newborn readmission charges for the intervention study periods. Figures were not adjusted for

inflation since the numbers utilized in the analysis were actual costs. The cost-benefit of the reduced charges in normal newborn readmissions were calculated by using the 1.3% reduction in the normal newborn readmissions during the comprehensive intervention, compared to baseline, multiplying this by the number of births in the comprehensive time period (8,288) and then multiplying the product by the average cost of normal newborn readmissions (\$4,755). Thus the equation used was [Reduction in NNR (1.3%)] * (Normal births during the comprehensive time period (8288) * (Average cost of NNR (\$4,755)) = [Cost savings (\$513,540)]. During the limited intervention there were no reductions in newborn readmissions; therefore, no cost-benefit calculations were performed.

Results

Demographics. Table 1 displays the demographic characteristics for those receiving the limited intervention and those who did not. The detailed demographic data for all births was only available during the limited intervention. The utilization of the comprehensive intervention may have different characteristics due to the program targeting mothers with social risk factors not just those in need of breastfeeding support, but this cannot be verified given the lack of demographic data for that group.

The mean age of mothers was 29 years. The mothers receiving the limited intervention were more likely to be Caucasian, speak English as their primary language, breastfeed, non-smoker, and have a para and gravida of ≤ 2 ($p < .001$).

Readmissions. During the comprehensive intervention time period, newborns were less likely to be readmitted (1.0%) than during the limited intervention (2.3%) or

at baseline (2.3%) ($p < .001$). The decrease from 2.3% (baseline) to 1.0% (comprehensive) represents a 55% reduction in normal newborn readmissions. There was no significant difference in the readmission rate between baseline (2.3%) and the limited intervention (2.3%) time periods. The differences in normal newborn readmission rates for those who received the intervention and those who did not within the limited and comprehensive time periods was not significant. The comprehensive intervention had a readmission rate of 1.0% for those who received the intervention while the rate for those who did not receive the intervention was .9%. During the limited intervention, those receiving the intervention had a readmission rate of 2.6% while those not receiving the intervention had a rate of 1.9%. Figure 1 details the readmission rates across all study time periods by year.

As shown in Table 2, those in the comprehensive group who received the intervention were significantly less likely to be readmitted more than once (0.0%) compared to those who did not receive the intervention in the same time period (24.9%, $p = .021$). In contrast, the individuals who received the limited intervention were significantly more likely to be readmitted more than once (26.0%) compared to those who did not receive the intervention (8.6% and $p = .003$). The baseline rate for those being readmitted more than once was 19%.

Costs. Table 3 shows the costs and charges affiliated with normal newborn readmissions. Since there were 8,288 patients during the comprehensive time period, it was projected that the comprehensive intervention reduced the total number of newborn readmissions by 108 ($8,288 * 1.3\%$). A reduction of 108 newborn readmissions with an

average normal newborn readmission cost during the comprehensive study period of \$4,755 resulted in a savings of \$513,540. However, \$2,959,000, with \$1,183,600 being allocated for the first 28 days postpartum, was spent on the intervention over the 4 years; thus, no overall cost reduction was achieved in normal newborn readmissions. In fact, there was a net cost of \$670,060. There were no reductions in normal newborn readmissions during the limited intervention in fact, there was a slight increase in costs, especially for those who received the intervention; therefore there were no cost savings.

There was no significant difference in the average cost per newborn readmitted across the three study time periods. The two-way ANOVA comparing the average costs per newborn readmission across all three time periods showed a significant interaction ($p = .04$) across limited and comprehensive time periods and whether or not the individual received the intervention. The average costs of normal newborn readmissions for those receiving the intervention in the comprehensive time period was significantly lower (\$4,181) compared to those not receiving the intervention (\$5,328) indicating that the newborns of mothers who received the intervention had fewer charges on average than those who did not. The average costs of normal newborn readmissions for those receiving the intervention during the limited time period was \$4,845 compared to those not receiving the intervention (\$3,785).

Clinical Implications

The results of this study show a positive relationship between providing comprehensive psychosocial support as part of a postpartum program and fewer readmissions among healthy infants. Providing comprehensive follow-up for new

mothers after the birth of their babies is a critical component of maternity care and should be an accepted norm rather than the exception. Readmission rates during the comprehensive time period decreased overall, not only among those who officially received the intervention. During the comprehensive time period a continuum of care was created within the entire maternity service line. The mother may not have officially received the complete intervention but all mothers did receive, at minimum, a visit from a FCC nurse while in the hospital or a phone call following discharge. The fact that support was available, even if it was not utilized, may have been an important factor in explaining the overall reduction in normal newborn readmission rates regardless of whether or not the mother officially received the program.

Although important, reducing newborn readmissions is likely only a fraction of the benefits the comprehensive postpartum follow-up provided to mothers, families and communities. We examined different levels of psychosocial support in postpartum programs. The results in this study suggest that the comprehensive psychosocial intervention was more effective in reducing normal newborn readmissions than breastfeeding support only. When applying these results to clinical practice, healthcare providers should consider the comprehensiveness of postpartum programs. Postpartum programs should include assessment, education, and intervention to address the complex problems facing mothers and infants following birth and not only address the issues that resources and reimbursement permit (Keppler & Roudebush, 1999; Nassen et al., 2005). Early problem identification and treatment during the postpartum period can have a positive effect on family well-being

and the early growth and development of infants. Gaffney and Altieri (2001) reviewed interventions that promote infant growth and found that mothers most preferred intervention strategies that use interpersonal communication, including the opportunity for mothers to ask questions. Mothers least preferred strategies included one-way messages such as written material, discharge instructions, and videos.

Interventions that do not address the psychosocial issues of the mothers are likely to be ineffective in promoting health and are wasteful of healthcare dollars. Our study supports the notion that addressing the psychosocial issues of the mother appeared to be more effective in promoting health.

There was no difference in normal newborn readmissions between the baseline and limited time periods, while rates were significantly lower during the comprehensive time period. This suggests that providing limited psychosocial support focused solely on breastfeeding education resulted in the same outcome in terms of readmissions as no intervention. The mothers receiving the limited intervention were more likely to be Caucasian, speak English as their primary language, breastfeed, non-smoker, and have a para and gravida of ≤ 2 . These characteristics do not fit the mold of a typical “high risk” mother often identified as ideal targets for intervention. There were likely other reasons mothers utilized the limited intervention and future postpartum programs should consider broadening their definition of “high risk” for the postpartum period to include mothers with limited social support.

The purpose of a community-wide program such as the FCC was to prevent developmental delays from becoming costly interventions, assess and treat mothers

experiencing varying levels of postnatal illness, validate and support new mothers when nothing was wrong, and channel mothers into appropriate care when needed. Although the data collected in this study did not address these processes, further research could include these parameters in a cost analysis to determine which are most effective.

Programs such as the FCC can be utilized as a triage for patients to receive care when appropriate and to receive reassurance through psychosocial support when everything is fine. Unfortunately there is no reimbursement code available to bill for all of the benefits associated with comprehensive postpartum follow-up care. In a time when healthcare is experiencing financial constraints and pressures to improve quality and access, it is worthwhile to consider alternative approaches and successful models providing effective postpartum care. This model was an example of collaboration between the hospital and physicians, with parties working together to improve quality outcomes for each patient. The center was a resource for the physicians and the physicians were a resource for the center when medical interventions were necessary.

While coordinated and comprehensive social support may have been effective in reducing normal newborn readmissions, it did not appear to be cost beneficial. There was a cost-benefit of \$513,540 when comprehensive psychosocial support was provided but it did not exceed the costs of the intervention allocated for the 28 day newborn period, which were \$1,183,600 or a net cost of \$670,060.

Goulet, Fall, D'Amour, and Pineault (2007) found that an effective coordination between community-based perinatal services and hospital-linked home phototherapy was a critical component for reducing the costs of newborn readmissions while

focusing on the needs of the mothers and newborns. While other studies showed no benefit when all moms were targeted (Shaw et al., 2006). The integrated network of community-based services was an essential condition for improved monitoring for both mother and baby. Effective coordination with community based social support services along with case management for high risk mothers may be a more cost-beneficial means of providing the important services needed in the postpartum period (Goulet et al.,). In our study, comprehensive psychosocial support appeared to reduce newborn readmissions but was not a cost-benefit to the hospital if looking solely at normal newborn readmissions as the outcome. Unfortunately, the financial value of intangible benefits, such as a decrease in family stressors that occur due to newborn readmissions, possible benefits to maternal mental health, the health benefits of breastfeeding, or reduced utilization in the emergency room or physicians offices, were not measured or factored into the analyses because of the subjective nature of measuring health and well-being factors.

Due to the structure of the limited intervention that provided only breastfeeding support, fathers were not included in the educational and support process. To make all mothers feel more comfortable men were not allowed, Scott et al. (2006) found that including the fathers in the educational process and providing psychosocial support as a family unit provides opportunities to monitor the skills of new parents, solve issues that may not be directly related to breastfeeding, and increase self-assurance that may improve breastfeeding skills. Data from our study showed that breastfeeding support alone was not effective in reducing normal newborn readmissions. The comprehensive

intervention which included fathers and other family members in the education process was more effective, but it is still unclear which component accounted for the success of the program.

In 2005, SACH was ranked by Healthgrades, one of the nations leading healthcare rating organizations, among the top 10% in the nation for maternity care and was given a maternity excellence award (Healthgrades.com). This award was likely received due to the interdisciplinary team that was developed during the comprehensive intervention. This award continues to be a major focus of the marketing efforts for the hospital even though the comprehensive intervention is no longer available. This indirect benefit cannot be factored into a simple cost-benefit analysis in our study yet there was an economic benefit to the hospital with an increase in mothers choosing SACH as their birthing hospital since the award in 2005, with an increase in births of 15%. This increase in births cannot be attributed to any contractual changes with health plans that could have caused a fluctuation in the number of births due to the fact that all contracts remained constant from 2001 to 2006. The decrease in births from baseline to the comprehensive time period most likely resulted from changes in contracts during that time period.

Further studies should include cost-benefit analyses that are proportional with the size, complexity and cost of the intervention. A better alternative to a cost-benefit analysis may be a cost-effectiveness analysis where dollars can be assigned to benefits where market prices do not exist, such as a person's life (Graham, 2003). Although the comprehensive program was not cost-beneficial in preventing normal newborn

readmissions based on costs of readmissions alone, the advantages of psychosocial support provided by healthcare professionals during the postpartum period may contribute to society and the healthcare institution beyond the simple cost analysis conducted in this study.

Strengths of Study

This research had a large dataset (14,786 participants) over a 7-year period (1999-2006). This dataset reflected the community and provided a comparison of three levels of psychosocial support in postpartum follow-up. The study also linked in-patient to some out-patient health services, which can be difficult to obtain in analyzing hospital discharge data. A major challenge in health care is to coordinate care for patients before and after they are discharged from the hospital thus this study was able to provide data on the continuum of care inside and outside the hospital.

Limitations of Study

In 2005, the American Academy of Pediatrics (AAP) changed their guidelines for readmissions for hyperbilirubinemia by due to the increase reports of kernicterus. Thus, the threshold for bilirubin levels for readmissions were decreased and these policies were implemented at SACH in the last quarter of 2005. This likely had a significant impact on the number of normal newborn readmissions and may partially account for the decrease in mean charges for readmissions during the latter portion of limited intervention, due to the decreased acuity in the normal newborns being readmitted.

The comprehensive intervention started half way through the 2000–2001 fiscal year and was incremental in the implementation. During this phasing in period the effect of the intervention is uncertain. An additional limitation to this study is the lack of demographic data for the comprehensive time period which prohibits the ability to examine the differences between those who received the intervention and those who did not, and to control for those differences or confounders on readmission rates and costs.

The accurate costs of health care could be the biggest mystery of the 21st century. Due to the secret nature of contract negotiations between providers and insurance companies, the actual costs of the services provided by hospitals is skewed. The hospital may charge a number but they are only reimbursed a portion of those charges and the reimbursement for each health plan can vary. The overall revenues for a hospital are significantly reduced when you account for the “secret” contract negotiations with health plans. Transparency of costs is rarely a reality in health care. The best estimate for a cost-benefit analysis includes the charges accumulated in finance for the particular service. Unfortunately, this is not the actual costs incurred or realized by the provider. This complicated reimbursement system severely limits a simple cost-benefit analysis. Prices paid for DRGs should be aligned to be more realistic with the actual cost the hospital accrues for care. Perhaps as transparency is demanded by the consumer in the consumer driven environment of healthcare more accurate cost analyses can be performed to better account for savings due to prevention and health promotion activities.

Implications for Future Research

Further research should include additional indicators beyond readmission rates in the effectiveness of postpartum programs. The only indicator of health that was utilized in this study was normal newborn readmissions which did not assess the mother's physical and mental well-being nor did it include additional benefits for the infant such as a reduction in unnecessary emergency department or 911 utilization. Further research should analyze if comprehensive psychosocial support provided during the first year of life had any correlation to infant mortality.

A major problem with a cost-benefit analysis is the inclusion of the obvious benefits and the exclusion of methods of those that may be less intuitive (Bar-Yam, 2006). In a postpartum program obvious indicators such as the cost of readmissions are included but not the "costs" of familial stress when a newborn has to be readmitted. When a newborn is readmitted back into the hospital this puts an enormous amount of stress on a new family and often additional family members will need to take time off work to care for the infant and provide support for the mother. These additional stressors and resulting economic burdens can add to a mother's naturally compromised mental state following childbirth but are challenging to include in a cost-benefit analysis.

Conclusion

Comprehensive psychosocial support in postpartum programs was successful in reducing normal newborn readmissions, lowering the average costs of newborn readmissions, and improving quality of the services provided inside the hospital and in

outpatient services. Reducing readmissions is a leading indicator of quality healthcare services. The key to sustainability of this type of program in the future is to identify cost effective means of implementing these critical services so we can have healthy beginnings for all families.

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Table 1. Demographic Characteristics between Those Who Received and Did Not Receive the Limited Intervention

Demographic Characteristic	Received Intervention		Did Not Receive Intervention		p-value
	n	Percent	n	Percent	
Race/Ethnicity (n=3,747)					<.001*
African American	78	3.8	81	4.8	
Caucasian	1121	54.3	737	43.8	
Hispanic	650	31.5	704	41.8	
Asian	118	5.7	88	5.2	
Other	70	4.6	73	4.4	
Mothers age (n= 3,458)					.262
18 and under	29	1.6	51	3.0	
19-24	302	17.0	319	19.0	
25-30	731	41.2	659	39.2	
31-34	433	24.4	379	22.5	
35+	280	15.8	275	16.3	
Language (n= 3,459)					<.001*
English/Primary Language	1539	86.7	1272	75.6	
English/Second Language	218	12.3	361	21.4	
No English	19	1.1	50	3.0	
Feeding Type In Hospital (n=3,439)					<.001*
Breastfeeding Only	1075	60.0	745	44.6	
Formula Only	99	5.6	332	19.9	
Formula and Breastfeeding	596	33.7	592	35.5	
Smoking Status (n=3,455)					<.001*
Non-Smoker	1751	98.8	1628	96.8	
Smoker	22	1.2	54	3.2	
Para (total # of viable births)(n=3,460)					<.001*
1	866	48.7	461	27.4	
2	591	33.3	645	38.3	
3	236	13.3	375	22.3	
4-8	84	4.8	202	12.1	
Gravida (total # of pregnancies) (n=3,460)					<.001*
1	713	40.1	381	22.6	
2	529	29.8	499	29.6	
3	304	17.1	399	23.7	
4-13	231	13.2	404	24.1	

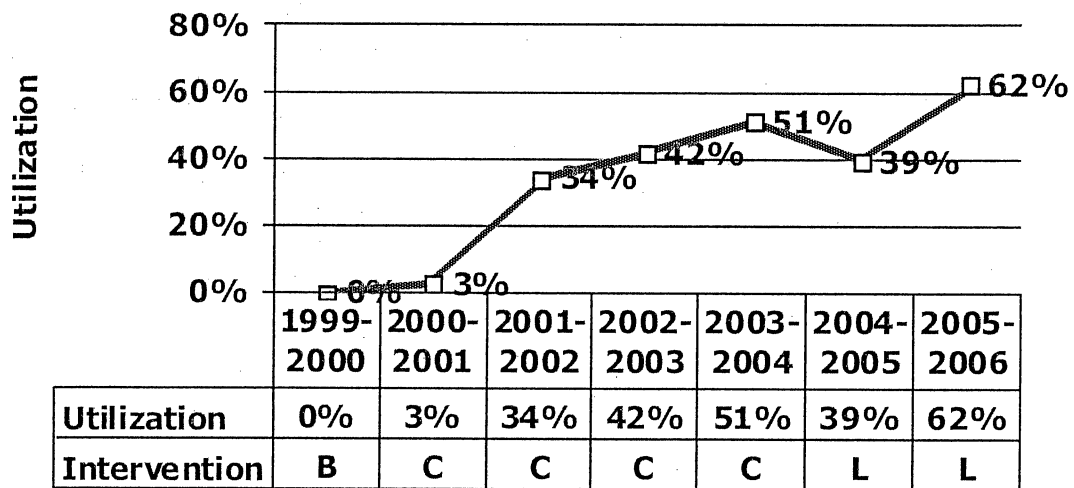


Figure 1. Percentage of Mothers Utilizing the Intervention for Each Time Period from 1999-2006

B = Baseline C = Comprehensive L = Limited

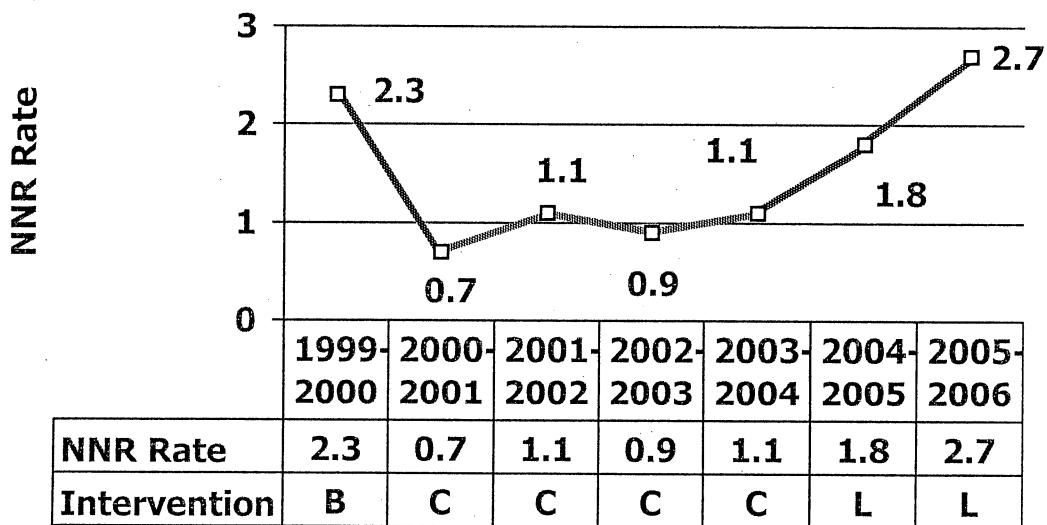


Figure 2. Normal Newborn Readmission Rates (NNR) from 1999-2006

B = Baseline C = Comprehensive L = Limited

Table 2. Normal Newborn Readmissions (NNR) Across Time Periods and Intervention Utilization Rates

		Study Time Period								
		Baseline (N=2,738)		Comprehensive Intervention (N=8,288)				Limited Intervention (n=3,760)		
				Received (n=2,458)		Did not Receive (n=5,830)		Received (n=1,894)		Did not Receive (n=1,866)
Readmit Variable	N	%	n	%	n	%	N	%	N	%
NNR Rates	62	2.3 ^a	24	1.0 ^b	55	0.9 ^b	50	2.6 ^a	35	1.9 ^a
Multiple NNR	12	19.4 ^c	0	0.0 ^d	13	23.6 ^c	13	26.0 ^c	3*	8.8 ^d

^{ab}Based on Pearson Chi-Square analyses, rates with different superscripts differed at p<.0001.

^{cd}Based on Pearson Chi-Square analyses, rates with different superscripts differed at p<.05.

* Out of 34 who were readmitted as 1 case was dropped due to missing charge data.

Table 3. Cost-Benefits Analysis and Normal Newborn Readmissions (NNR) Across Study Time Periods

		Study Time Period				
		Baseline (N=2,738)	Comprehensive Intervention (N=8,288)		Limited Intervention (n=3,760)	
			Received (n=2,458)	Did not Receive (n=5,830)	Received (n=1,894)	Did not Receive (n=1,866)
Average Charge per NNR	\$4,149	\$4,181**	\$5,328**	\$4,845**	\$3,785**	
Average Charge NNR/ Study Time Periods	\$ 4,149	\$ 4,755		\$ 4,315		
Costs of Intervention for 28 days Postpartum Per Time Period		\$1,183,600		\$574,200		
Savings/Benefit		\$513,540		No Cost Saving		

* Reduction of 108 NNR times \$4755 (mean charges for NNR during comprehensive time period)

**Interaction between Comprehensive and Limited Time Periods and Intervention Utilization (p=.04)

Clinical Implications

- Providing comprehensive follow-up for new mothers with social and breastfeeding support after the birth of their babies is an important component of maternity care and may reduce normal newborn readmissions.
- Breastfeeding support alone may not be adequate in a postpartum program to improve infant health outcomes.
- Education and psychosocial support in the hospital may be overlooked because of other essential functions are a priority such as monitoring and support to ensure infant stabilization.
- Mothers received lactation support in group settings, which limited the father's involvement.

CHAPTER 5

OTHER FINDINGS/DISCUSSION

A. Introduction

For decades researchers have examined the effectiveness of reduced obstetrical hospital stays and the provision of adequate follow-up care. Unfortunately, there has been minimal attention to the effective components of postpartum care. This study contributes to the dearth body of research identifying essential elements of an effective postpartum program for obstetrical hospital stays. In Chapter 4, I did not go into detail about all the results of the study due to length restrictions. This section briefly summarizes the results and addresses other findings along with a discussion of the strengths and limitations of this study.

B. Discussion of Key Findings

With the ongoing struggle to reduce healthcare costs, hospitals and healthcare providers continue to look for ways to maintain costs while providing quality care. In my study I had the opportunity to review a large dataset and examine the relationship between costs, readmissions, and psychosocial support. Unfortunately, due to the limitations of a simple cost-benefit analysis, the intervention with the most beneficial health outcomes did not have a cost-benefit. There was a statistically significant reduction in normal newborn readmissions when a comprehensive postpartum program was offered, although the costs savings from newborn readmissions did not justify the expenditures in the intervention.

The individuals, or mother baby couplets, who received the psychosocial support in the comprehensive intervention (1.0%) were less likely to be readmitted than those enrolled in the limited intervention (2.3%) or at baseline (2.3%). Among those who actually received the intervention, those in the comprehensive group were less likely to be readmitted more than once (0.0%) compared to those who did not receive the intervention (24.1%). Those who received the limited intervention were more likely to readmitted more than once (26.5%) compared to those who did not receive the intervention (8.6%). The baseline rate for those being readmitted more than once was 19%.

The data for the feeding type in the hospital was only available for the limited intervention which was focused on breastfeeding support, and it is no surprise that the majority of the participants who received the intervention were the breastfeeding only, and formula and breastfeeding infants. Those mothers who received the intervention were significantly more likely to exclusively breastfeed (63.2%) compared to those mothers who chose to formula feed their infants (26.6%) ($p=.001$). The results of this study suggest that infants who were exclusively breastfed in the hospital had significantly higher rates of normal newborn readmissions (67.7%) than those who were formula fed (30.6%) ($p = .013$). This does not necessarily mean that breastfeeding causes hyperbilirubinemia but that inadequate breastfeeding is a risk factor for normal newborn readmissions, which is consistent with the literature (Augustine, 1995; Geiger et al., 2001; Paul et al., 2004). Poor caloric intake and or dehydration associated with inadequate breastfeeding may contribute to the development of hyperbilirubinemia

which is the reason the AAP recommends that mothers breastfeed their infants at least 8-12 times for the first several days.

The average cost of normal newborn readmissions for baseline was \$4,149 compared to the comprehensive intervention (\$4,755) and approached significance ($p=.109$). There was a significant interaction between whether a participant received the intervention and the time period of the intervention ($p=.04$), as displayed in Figure 2. The mean charges for normal newborn readmissions was \$4,181 for those receiving the comprehensive intervention and \$5,328 for those not receiving the comprehensive intervention during the comprehensive time period. This was reversed during the limited intervention which showed a mean charge of \$4,845 for those receiving the intervention compared to \$3,785 for those who did not receive the intervention. This contrast may be attributed in part to the policy changes in readmissions for hyperbilirubinemia in 2005, discussed in the limitations section of this chapter, or to the large percentage of breastfeeding mothers during the limited intervention time period as they were the main target for the limited intervention.

Fortunately for the field of disease prevention and health promotion, the federal government is in the process of instituting a movement called pay for performance (United States Department of Health and Human Services, 2005). Pay for performance also known as “P4P” or “value based purchasing” is an emerging movement where providers are reimbursed based upon the quality of healthcare services provided. We should not discount the value of psychosocial support and postpartum programs because it did not provide immediate solutions to the fiscal challenges facing our

healthcare system. Pay for performance may provide opportunities for the healthcare industry to embrace health education and prevention on the merits of improving health and well-being and for increasing the value of our investments in health.

C. Strengths of Study

This research relied on a large dataset (14,786 participants and 225 normal newborn readmissions) over a 7-year period (1999-2006) and reflected the community through the utilization of a dataset from a community hospital rather than a subset of certain health plans. The study linked in-patient to out-patient health services, which pose challenges in obtaining and analyzing hospital discharge data. A major challenge in health care is to coordinate care for patients before and after they are discharged from the hospital. This program allowed for follow-up after discharge which is rare outside of an integrated health system. The FCC intervention was designed with specific objectives that were measured and entered into an Access database to be utilized for future research. The three varying levels of psychosocial support from healthcare providers in this study over a long period of time provided the opportunity to examine a dose response relationship.

D. Limitations of Study

In July of 2004, the AAP revised their guidelines to provide a framework for the prevention and management of hyperbilirubinemia in newborn infants older than 35 weeks. These guidelines provide a framework for the prevention and management of hyperbilirubinemia in newborn infants of 35 or more weeks of gestation. The indicators for bilirubin levels for readmissions were decreased. The AAP changed their

guidelines for readmissions for hyperbilirubinemia due to the increase reports of kernicterus. The Joint Commission on Accreditations of Healthcare Organizations distributed a sentinel event for kernicterus. A sentinel event is an unexpected occurrence involving death or serious physical or psychological injury, or the risk thereof. Serious injury specifically includes loss of limb or function. Such events are called "sentinel" because they signal the need for immediate investigation and response. As a result, in the last quarter of 2005, SACH changed their guidelines for screening babies at risk of hyperbilirubinemia and performed a bilirubin check on every baby prior to discharge from the hospital and the threshold for bilirubin levels for readmissions were decreased. In addition, bilirubin checks were performed at the Healthy Beginning Family Care Centers. The aggressive change in policies may have caused a slight increase in newborn readmissions in 2005 thus having a potential internal validity threat due to history. This likely had a significant impact on the number of normal newborn readmissions and may partially account for the decrease in mean charges for readmissions during the latter portion of the limited intervention, due to the decreased acuity in the normal newborns being readmitted.

The mean charges for normal newborn readmissions at baseline in 1999 were \$4,149 and during the limited intervention in 2004-2006 were \$4,315. There were also changes in contracts with health plans in 2000 that may have impacted the birth rate for the hospital but unlikely impacted the readmission rates. Newborns receiving the intervention during the limited time period may have self-selected the intervention because they were experiencing difficulty in breastfeeding or the physicians confidence

in the postpartum program increased over time and they began referring their higher acuity patients to the FCC.

Additional limitations are related to retrospective data abstraction. It is impossible to add data elements identified after the interventions were implemented. The analysis was limited to the variables collected and the data for the comprehensive intervention was not archived appropriately. It is also difficult to control for errors in data collection and abstraction. Lastly, since this study involves a retrospective analysis it does not account for possible selection biases that may have initially led the client to a visit to the FCC.

The comprehensive intervention started halfway through the 2000-2001 fiscal year and was incremental in the implementation during the first year. As a result the effect of the intervention is uncertain during this phasing in period. An additional limitation to this study is the lack of demographic data for the comprehensive time period, which prohibited my ability to examine the differences between those who received the intervention and those who did not, and to control for those differences or confounders on readmission rates such as the feeding type in the hospital, high bilirubin levels for the infant while in the hospital, or if “high risk” mothers were targeted. During the comprehensive time period all mothers delivering at the hospital received some portion of the intervention even if they did not attend the FCC.

In performing the cost-benefit analysis the hospital charges were utilized as the indicator for costs. Due to the lack of transparency of costs in hospitals these numbers may not accurately reflect the costs incurred by the hospital. Hospital charges are

based upon the charges to the insurance companies and are not a true reflection of costs.

The accurate costs of healthcare are extremely challenging to identify in the hospital setting. The closed and confidential contract negotiations between providers and insurance companies make the actual costs of the services provided by hospitals skewed. The hospital may charge a dollar amount but they are only reimbursed a portion of those charges and the reimbursement for each health plan can vary. The overall revenues for a hospital are significantly reduced when one accounts for the “secret” contract negotiations with health plans. Transparency of costs is rarely a reality in healthcare. The best estimate for a cost-benefit analysis includes the charges accumulated in finance for the particular service. Unfortunately, this is not the actual costs incurred or realized by the provider. This complicated reimbursement system severely limits a simple cost-benefit analysis. Prices paid for Diagnosis Related Groups (DRGs) should be aligned to be more realistic with the actual cost the hospital accrues for care. Perhaps as transparency is demanded by the consumer in the consumer driven environment of healthcare more accurate cost-benefit analysis can be performed to accurately account for savings due to prevention and health promotion activities.

Additional limitations to the cost-benefit analysis are the exclusion of the data for participants who received the intervention but gave birth or were readmitted to another hospital. Those participants were excluded from the study as we did not have access to any readmission data. This accounted for about 420 participants or 3% during

the comprehensive and limited intervention time periods as identified in the FCC database.

E. Generalizations

The strength of this research is the large dataset from a community hospital used for analysis allowing for the results to be generalized to the larger population. The study participants were highly reflective of the general population especially within the state of California (U.S. Census Bureau, 2000). The demographic differences were less reflective of the United States overall. The Hispanic (36%) and Asian (15%) population is much greater in California than in the United States, (12%) and (4%) respectively. The ethnicities of the mothers utilizing the FCC during the limited time period were 32% Hispanic and 6% Asian indicating that this population is more reflective of California. This study was conducted in a private not-for-profit hospital and the participants may not be comparable to a large Medicaid population. Although there was no control group outside of the hospital the three time periods allowed for comparison across the intervention. The study population was representative of mothers of singletons who had uncomplicated vaginal and caesarean deliveries which represent the majority of births in the United States (National Center for Health Statistics). Therefore these results do not generalize to county facilities with complicated pregnancies and deliveries or multiple births.

F. Challenges

The major challenge in conducting this research was due to the different datasets used to house the data during the different time periods of the intervention. The

same data elements were not collected across all three time periods. For instance the demographic information for all of the births during the comprehensive and baseline time period would have been a major asset to this research but the data available was incomplete and thus not utilized in this study. Other major challenges included data collection from different sources even within the same time period of the study. The medical record had to be matched with the data source in hospital finance and the FCC. The dataset that was originally set up during the comprehensive time period was not accessible and the matching of FCC and hospital discharge data was dependent upon very busy hospital employees in the finance department. The dataset at the FCC was not accessible to hospital employees because it was entered into SPSS, a software not accessible within the hospital. The hospital had purchased the data entry builder for SPSS and not the full program making it challenging to identify and manipulate any of the initial data.

The large dataset made data manipulation very challenging. Data from multiple data sources had to be condensed into one large dataset. Normal newborn readmissions for all of the years were separated out into a smaller dataset to allow for finer manipulation. The continual conversion of multiple datasets to a single dataset also increased the possibility of errors due to formatting of both the Excel and SPSS software programs. There was not a single hospital employee who could manipulate SPSS due to the absence of the software on hospital computers and a lack of a knowledge base by hospital employees. It was as if there were two languages utilized to interpret the data and a constant shifting of software when a variable was added.

Challenges incurred by the actual interventions included the politics of grant funding, implementing significant change within an organization, and allowing for program start up and program changes during data collection. When temporary grant funding is utilized for a majority of the operating costs for a program there is significant pressure on the employees to perform. This likely limited the potential of the data collection to identify effective components of the intervention because the program was focused on data collection to meet the funders requirement verses data that may be useful in sustainability and program improvement. Ideally these two purposes should be parallel but were not applicable in this intervention. The funding for the intervention was first received in July of 2000 which was the first funding cycle of the Proposition 10, the tobacco tax dollars, now referred to as First 5 of San Bernardino. Due to the political pressure to release these funds to the local counties, proper protocols, staffing, and procedures were not instituted before the distribution of the funds. These dollars were also a large contribution to a desperately underfunded county with significant needs. The funding allocation was directed by a commission comprised of representatives from each supervisor district. This created a highly political environment and competition for the funding and resource allocation grew as more of the community identified this as a significant source of funding. In 2000, the only limitation for the funding was that it was allocated for individuals aged prenatal to 5 years.

After the first 2 years of funding, the political pressures became so great for additional agencies to access this money another funding cycle was opened. The third

year of funding originally promised was revoked for all agencies and a new application process was instituted. The cumbersome grant process and political maneuvering took much needed energy away from a newly developed program. In 2002, the funding for the FCC was not renewed due to misconceptions about the hospital as a whole by the funding agency. The denial was appealed by First 5 of San Bernardino when the misconceptions were clarified and the funding was renewed for another 2 years. In 2004, the funding for the comprehensive program was not renewed but some monies were available for a limited intervention. Due to the financial constraints in health care, the hospital did not have a sustainability plan in place to maintain the services at the level of the comprehensive intervention. The inconsistencies of the funding had a significant impact on the morale of the employees and the mothers receiving the intervention.

Although the funding was received in July of 2000, the first patients were not seen until November of 2000. The lag in patient utilization during that first fiscal year made it challenging to identify which data participants should be included in baseline and/or the comprehensive time period. Due to the fact that the program was so comprehensive, it took time to have all of the data elements in place that first year. The data from July 2000 was to be included in the comprehensive time period because many program components were being implemented.

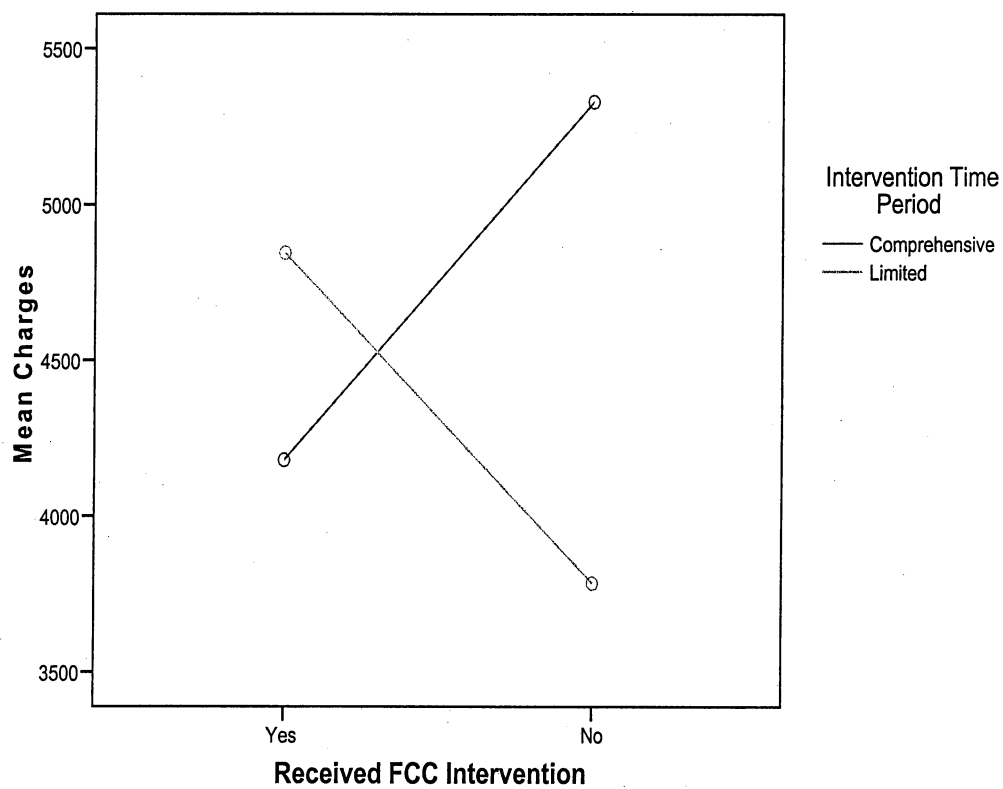
A different challenge arose when the comprehensive intervention was scaled back to a limited intervention with breastfeeding support only. Due to the reduction in funding, the social worker along with several of the nurses had to be released or

transferred to another department. Again, this decreased morale among the staff and program participants. The mothers attending the FCC had a very high level of satisfaction with the program and they were disappointed with the reduction in services. In addition to the other changes, the data collection system for the limited intervention was altered and another system and database was utilized to measure program outcomes. There was also data lost from the FCC during the months of July and August in 2004. During those months, birth and readmission data was collected from the hospital database and then matched with program participants at the FCC. All other data collected from FCC was lost for those 2 months. The transitions from implementation to the reduction of services posed significant challenges for this study.

In 2002, due to the success of the program, the director of FCC was offered a position as a nursing director for the medical/surgical units within the hospital. Consistent leadership in newly developed programs is critical and this placed a significant challenge in the consistency of the data collection system.

One final challenge emerged when performing the cost-benefit analysis. The data for the costs of the program had been collected in fiscal years and all of the hospital data was collected in calendar years. In order to maintain the integrity of the analysis all of the hospital data needed to be converted to fiscal years. This made data analyses very challenging because I had to go back to the original database and identify which patients belonged in the correct fiscal year. This may have caused errors in placing normal newborn readmissions in the correct time period.

Figure 3. Mean Charges Across Comprehensive and Limited Time Periods and Whether Participants Received FCC Intervention



CHAPTER 6

CONCLUSIONS AND RECOMMENDATIONS

A. Introduction

The results of this research suggest that providing comprehensive psychosocial support can have a significant impact on normal newborn readmissions. Mothers delivering their infants during the comprehensive intervention time period had fewer readmissions for their newborn babies and when readmitted they were less likely to have multiple reoccurrences as compared to baseline or during the limited breastfeeding support intervention time period. The cost-benefit analysis showed that the intervention was not cost-beneficial. There was no significant difference in the average cost per newborn readmitted across the three study time periods. The two-way ANOVA comparing the average costs per newborn readmission across all three time periods showed a significant interaction ($p = .04$) across limited and comprehensive time periods and whether or not the individual received the intervention. The average costs of normal newborn readmissions for those receiving the intervention in the comprehensive time period was significantly lower (\$4,181) compared to those not receiving the intervention (\$5,328), while in the limited intervention the average costs were higher for those receiving the intervention (\$4,845) than those not receiving it (\$3,785).

B. Conclusions

While shortened hospitalizations for childbirth have become a societal norm, it is imperative that we implement interventions that provide essential support for families that monitor both their physical and mental well-being. Comprehensive and coordinated support services for families following birth appear to be a critical link in reducing newborn readmissions.

The accepted norm for postpartum follow-up is 6 weeks following childbirth; however, significant changes in a mother's life can occur up to 1 year following delivery. Most postpartum programs include a one time visit during the first 2 months following birth. The comprehensive intervention continued to provide psychosocial support at 3, 6, 12, 18, and 24 month intervals. This ongoing support may be related to the reduction or absence of multiple readmissions during the comprehensive intervention. Those receiving the intervention during the comprehensive time period did not have a single multiple readmission. Future research will need to examine the longer term outcomes such as unnecessary emergency room visits and primary care utilization up to 2 years of age for program participants.

With the increase in health care costs and the absence of billable charges for health promotion there is a critical need for coordination of support services for families following childbirth. Although the comprehensive intervention showed a decrease in hospital utilization, it was not cost beneficial. Women and infants appeared to benefit from the comprehensive intervention, even those who did not officially receive the intervention, but the economic rationale does not exist for healthcare

administrators to implement this intervention. Those not receiving the intervention appeared to benefit from the presence of a continuum of quality care. This study suggests a rationale for reforming the current reimbursement system and a justification to implement pay for performance in maternity services. Pay for performance is a payment model that financially rewards hospitals for meeting certain performance measures for quality and efficiency (United States Department of Health and Human Services, 2005).

C. Recommendations for Future Research and Health Education Practice

1. Implications for Health Education Practice

Providing comprehensive follow-up for new mothers after childbirth is an important component of maternity care. If psychosocial support is not available in existing postpartum programs, effective coordination with community-based support services along with case management for “high risk” mothers should be an alternative. The definition of “high risk” mothers for readmission should also be reconsidered. This study suggests that mothers at risk of being readmitted are those that exclusively breastfed their infants during their hospital stay.

Breastfeeding support is an important aspect of postpartum programs but this study suggests it is not sufficient to improve health outcomes. When the FCC received a reduction in funding during the limited study time period it was assumed by all staff members that breastfeeding support was the critical element that should be sustained in future postpartum programs. Although this may be an obvious and important issue for new mothers, it may not have been the primary underlying reason women were

utilizing the comprehensive psychosocial intervention. The presence of psychosocial support by qualified healthcare providers may be one of the essential components of an effective postpartum program.

2. Implications for Further Research

Further research should include additional indicators in the effectiveness of postpartum programs. The only indicator of health utilized in this study were normal newborn readmissions which did not assess the mothers' physical and mental well-being nor did it include additional benefits for the infant such as a reduction in unnecessary emergency department or 911 utilization. Infant mortality is also tracked and earmarked to their birthing hospital. Further researchers should analyze if comprehensive psychosocial support provided during the first year of life correlated to infant mortality. Tracking longer term outcomes, such as emergency room utilization, kindergarten readiness, obesity, and diabetes would also be of great value.

The original intent of a cost-benefit analysis was to estimate and total the equivalent money value of the benefits and costs to the community of projects to establish whether they are worthwhile. A major problem with a cost-benefit analysis is the inclusion of the obvious and intuitive benefits and the exclusion of methods of measurement that may be less intuitive (Graham, 2003). In a postpartum program we think of including the obvious indicators such as the cost of readmissions but how can you include the increase costs of familial stress when a newborn has to be readmitted? When a newborn is readmitted back into the hospital this puts an enormous amount of stress on a new family and often additional family members will need to take additional

time off of work. These additional stressors and economic burdens can add to a mothers naturally compromised mental state following childbirth but are challenging to include in a cost-benefit analysis.

Other areas for additional research include examining the value of including fathers and other family members in the intervention. Scott et al. (2006) found that breastfeeding determination was closely related to parental attitudes on breastfeeding rather than on sociodemographics. Additional evidence focused on the value of including families and providing psychosocial support to both mother and father may be a critical link in supporting proper breastfeeding for the infant.

This research assessed the cost-benefit associated with coordination of comprehensive services in a hospital based postpartum program. Future research may want to isolate a small group receiving psychosocial support by healthcare providers in other community based programs and perform a cost-benefit analysis with additional health indicators. A careful cost-benefit analysis should include a comprehensive systems approach taking into account the fragmentation of the current healthcare system.

3. *Summary*

Often prevention and health education are promoted as a means to improve health status and save healthcare costs. While this research does not support a cost-benefit in normal newborn readmissions when psychosocial support was provided in a postpartum program, it does support there were health improvements. Economic evaluations for prevention and health education should consider reframing their

position from simply saving money to whether or not there was a health improvement for a reasonable cost compared to other alternatives.

As a result of the implementation of the FCC, San Antonio Community Hospital earned a prestigious award from HealthGrades, the leading independent healthcare ratings company in the United States, for their quality maternal child health services in 2005. Although we cannot directly link patient satisfaction to the postpartum programs we do know that SACH ranked in the 88th percentile for patient satisfaction for overall maternity care in the first round of publicly reportable data (www.hospitalcompare.hhs.gov) in March of 2008. This report provided a comparison of all birthing hospitals in California, with most hospitals scoring in the 65th percentile. While writing the grant in 1999 for the FCC, the Healthy Beginning Transformation Team was created with the purpose of transforming maternal child services in the hospital. This team began to look internally at quality indicators that they felt were important to their patients not indicators that were mandated from a regulating agency. This process created a culture of quality and allowed for internal reflection. This team continues to meet today and has been instrumental in the quality services provided at the hospital. The problem with the FCC implemented in 2000-2004 was that the reimbursement system for health services was not in alignment for incentivizing health promotion, prevention, and quality care. Comprehensive psychosocial support in postpartum programs was successful in reducing normal newborn readmissions, improving overall quality of the services provided inside the hospital and in outpatient services, and possibly in maternal satisfaction. The key to sustainability of this type of

program in the future is to identify cost effective means of implementing these critical services so we can have healthy beginnings for all of our families.

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Appendix A: Infant Assessment/Data Collection Tool

Infant Assessment /Data Collection Tool (Face to face interview)

Name: Date of visit: PVHMC ___ KSR ___ OTH Mother ID#: Hospital ID#: Mother DOB: ___ ONT ___ FON Mother DOB: Infant DOB:	Gravida/Para: Location of Delivery ___ SACH ___ OB: _____ PED: _____ Type of Visit: ___ Home ___ Center Location of Center: ___ RSA ___ UPL City of Residence: Ethnicity of Child: ___ White/Caucasian ___ Black/Afr. Amer ___ Hispanic/Latino ___ Asian/Pacific Isl. ___ Native Amer. ___ ___ Other
---	--

of parents caregivers _____

of siblings _____

1. **Hours since discharge:** ___ < 24 ___ 24-48 ___ > 72
2. **Infant's weight today** _____
3. **Feeding Type:** (mark all that apply): ___ Breastmilk ___ % ___ formula ___ water ___
 water/sugar/syrup ___ tea ___ juice ___ other _____
4. **Was the baby readmitted to the hospital within the first 28 days of life for any reason?**
☐ yes ☐ no If yes please indicate _____
5. **Developmental assessment performed** ___ yes ___ no
 Referral made ___ yes ___ no To whom: _____
 Date Referral Made _____ Within 30 days ___ yes ___ no
6. **Mother and Infant demonstrates engagement activities:** ___ yes ___ no
7. **Infant height percentile** ___ 5th ___ 10th ___ 25th ___ 50th ___ 75th ___ 90th ___ 95th ___ 100

Infant weight percentile ___ 5th ___ 10th ___ 25th ___ 50th ___ 75th ___ 90th ___ 95th ___ 100
 Referral made ___ yes ___ no To whom? _____
8. **Insurance coverage assured for the infant** ___ yes ___ no
 Referral made ___ yes ___ no If yes, please indicate:
 ___ Healthy Families ___ Medi-Cal ___ Private Insurance ___ other
9. **Postpartum Distress Assessed** ___ yes ___ no
 PDSS Screening Tool Used ___ yes ___ no
 Referral made ___ yes ___ no To whom? _____
10. **Smoking status**
 Mother smokes ___ yes ___ no Number of cigarettes per day _____
 Referral made ___ yes ___ no To whom? _____
 Other household member smokes ___ yes ___ no
 Who is smoker? _____
 Referral made ___ yes ___ no To whom? _____
11. **Assessed for substance abuse** ___ yes ___ no **SASE Used** ___ yes ___ no
 Type of drug(s) ___ alcohol ___ illicit drugs ___ other _____
 Referral made ___ yes ___ no To whom? _____
 Other family member uses substances ___ yes ___ no
 Type of drug(s) ___ alcohol ___ illicit drugs ___ other _____
 Referral made ___ yes ___ no To whom? _____
12. **Domestic violence assessment:**
 Assessed for domestic violence ___ yes ___ no Abuse Assessment Screen used
 ___ yes ___ no
 Referral made ___ yes ___ no To whom? _____

Appendix B: Consent Form

COMMUNITY HOSPITAL

FAMILY CARE CENTER CONSENT

- ✓ I have read and understand the attached Patient's Rights & Patient's Responsibilities.
- ✓ I understand that I may choose not to participate in the program at any time. At which time, I am welcome to reschedule services at my convenience or call 980-BABY with any questions or concerns regarding the health of my child or me.
- ✓ If you believe that there has been a violation of any laws or regulations, or if you have a problem regarding services received, you have the right to file a grievance. Identify the complaint/grievance in writing and discuss it with the Program Manager as well as forwarding a copy to:
Children and Families Commission for San Bernardino County
Attn: Children and Families Commission Board
330 North D Street, Suite 420
San Bernardino, CA 92401
- ✓ I give my consent for the Healthy Beginnings Post Partum Family Care Center staff to examine me and my child, receive educational advise, be referred to appropriate agencies if needed, and provide a medical and psychosocial history. The contents of my chart may be relayed to my physician or to my child's physician or to a referring program, if necessary.

Signed: _____
Post Partum patient & parent of minor

witness

Date

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Appendix C: IRB Exemption Notice



INSTITUTIONAL REVIEW BOARD

Exempt Notice

OFFICE OF SPONSORED RESEARCH • 11188 Anderson Street • Loma Linda, CA 92350
(909) 558-4531 (voice) • (909) 558-0131 (fax)

OSR# 57201

To: **Marshak, Helen H**
Department: **Health Promotion & Education**
Protocol: *Psychosocial support, newborn re-admissions, and postpartum follow up*

Your application for the research protocol indicated above was reviewed administratively on behalf of the IRB. This protocol is determined to be exempt from IRB approval as outlined in federal regulations for protection of human subjects, 45 CFR Part 46.101(b)(4).

Stipulations:

Please note the PI's name and the OSR number assigned to this IRB protocol (as indicated above) on any future communications with the IRB. Direct all communications to the IRB c/o the Office of Sponsored Research.

Although this protocol is exempt from further IRB review as submitted, it is understood that all research conducted under the auspices of Loma Linda University will be guided by the highest standards of ethical conduct.

Signature of IRB Chair/Designee: _____

R. L. Rigsby

Date: _____

8/7/07

Loma Linda University Adventist Health Sciences Center holds Federalwide Assurance (FWA) No. 6447 with the U.S. Office for Human Research Protections, and the IRB registration no. is IORG226. This Assurance applies to the following institutions: Loma Linda University, Loma Linda University Medical Center (including Loma Linda University Children's Hospital, LLU Community Medical Center), Loma Linda University Behavioral Medicine, and affiliated medical practices groups.

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