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UNIVERSITY OF SAN DIEGO

Hahn School of Nursing and Health Science

Antepartum, Intrapartum, and Postpartum Predictors of Readiness for Hospital Discharge
and Post-Discharge Outcomes

By

Gabriella Malagon-Maldonado

A dissertation presented to the

FACULTY OF THE HAHN SCHOOL OF NURSING AND HEALTH SCIENCE

UNIVERSITY OF SAN DIEGO

In partial fulfillment of the requirements for the degree

DOCTOR OF PHILOSOPHY IN NURSING

May 2015

Dissertation Committee

Cynthia D. Connelly, PhD, RN, FAAN, Chairperson

Ruth A. Bush, PhD, MPH

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Abstract

Pregnancy and childbirth are significant events in the lives of women and their families where the discharge decision-making process involves careful judgment in projecting the mom's ability to cope with care needs after discharge. Research examining the predictors of discharge readiness and post-discharge outcomes taking into consideration antepartum and intrapartum factors influencing readiness for discharge has not been conducted. The purpose of this study was to explore the antepartum, intrapartum, and postpartum predictors of readiness for hospital discharge and post-discharge outcomes. The *Adaptation to Transitions* conceptual framework composed of conceptually-related variables was developed and guided the descriptive correlational repeated measure design study. A purposive sample of English and Spanish-speaking postpartum mothers who experienced a vaginal or cesarean birth of a healthy infant ($N = 185$) completed demographic, quality of discharge teaching, and readiness for hospital discharge questionnaires prior to discharge. Four weeks post-discharge, participants completed a coping difficulty questionnaire and the quality of discharge teaching questionnaire to compare pre- and post- hospital perceptions of teaching. A final model was computed with all significant predictors for readiness for hospital discharge and post-discharge coping difficulty. Infant length of stay, the delivery of education, and the difference between educational content received and the educational content needed, were the significant predictor variables accounting for 42% of the variance in readiness for hospital discharge ($R^2 = 0.44$, $R^2_{adj} = 0.42$, $F(8, 176) = 17.5$, $p < 0.001$). Participants with less than high school education and the difference between educational content received and needed were the two significant predictor variables accounting for 28% of

the variance in post-discharge coping difficulty ($R^2=0.33$, $R^2_{adj}=0.28$, $F(6,60) = 5.1$, $p < 0.001$). Nurses' skill in the delivery of education, the educational content received, and the post-discharge coping difficulty were predictive of utilization of post-discharge health care services. A statistically significant difference in the quality of discharge teaching between pre- and post- hospital discharge was also noted. The relationship between quality of discharge teaching, readiness for discharge, and post-discharge coping and utilization provides evidence of nurses' critical role in educating patients and families to facilitate a smooth transition home after childbirth.

Dedication

I wish to dedicate this dissertation to my family. To my loving husband Mauricio, for all his infinite wisdom, love, patience, and understanding. Thank you for supporting me as a lifelong learner and through another doctorate degree. I am confident that you will accomplish all your dreams. To my supportive parents, Miguel and Angelina, whose relentless tenacity and unconditional love has always given me the strength to persevere. To my grandmother Matilde, my biggest inspiration, and to family that has passed on before me. You will always be in my heart. Les quiero con todo corazon.

Acknowledgments

I am extraordinarily grateful to Dr. Cynthia Connelly, whose intellectual generosity was a constant from the moment she agreed to be my committee chair; to Dr. Bush for her statistical acumen, guidance, and patience throughout the data analysis; and to Dr. Georges for her wisdom and theoretical perspectives - the foundation for many research studies.

To my work colleagues: Dana Cohen, Jackie Hiner, Monika Lanciers, Deb Poeltler, and Jan Stichler for their insight, encouragement, and relentless efforts in facilitating optimal care outcomes. I am also grateful for the patients and families who participated in this study.

I would like to express my deepest gratitude to the individuals, institution, and organization that have financially assisted my doctoral education including Bob and Betty Beyster for their generous contribution to the Achievement Rewards for College Scientists (ARCS) organization, the University of San Diego Hahn School of Nursing and Health Science, and Sharp HealthCare's Center of Nursing Excellence (CoNE). I am equally grateful to be the recipient of the Graduate Dean's Scholar Award which provided the financial support needed to conduct my research study.

I am indebted to the individuals who have willingly offered their expertise, attention, and support while on this journey and blessed to have them in my life.

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CHAPTER 1-OVERVIEW

Introduction

Pregnancy and childbirth are significant events in the lives of women and their families but often are marked with distress during pregnancy and the postpartum period (Britton, 2007; Stock & Lynch, 2000). There is a spectrum of problems that can occur during this time varying from infection, bleeding, pain, and incontinence to depression all of which can lead to adverse outcomes after hospital discharge (Wan, Hu, Thobaben, Hou, & Yin, 2011). The discharge decision-making process involves careful judgment in projecting the mom's ability to cope with family care needs after discharge that depend on a mother's own physical and mental readiness and knowledge regarding how to care for herself and a new baby.

The readiness and preparation for hospital discharge became a national concern with the passage of the Newborns' and Mothers' Health Protection Act in 1996, shortening the length of hospital stay to lengths that were previously considered to be "early discharge" (Eaton 2001; General Accounting Office 1996; Secretary's Advisory Committee on Infant Mortality, 2001). Hospital discharge from postpartum before a mother is physically and/or psychologically ready, places the mother and infant at a

greater risk of detrimental maternal and infant health outcomes, increase use of health services, and the adoption of poor behaviors during the postpartum period (Bernstein et al., 2002; Margolis, Kotelchuck, & Chang, 1997). As a result, the American Academy of Pediatrics (AAP) enacted a policy statement on hospital stays for healthy term newborns, highlighting the physical, psychological, and social well-being of mother and infant that must be assessed and information must be provided prior to discharge (AAP, 2010).

Literature Search Methods

A systematic examination of the research to identify as many factors associated with mothers' readiness for discharge in the antepartum, intrapartum, and postpartum periods and the subsequent outcomes was not previously conducted rendering additional research necessary to inform practice and policy regarding the factors and outcomes associated with mother's readiness for hospital discharge. The approaches used in this systematic review were informed by guidelines outlined in the Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) (Moher, Liberati, Tetzlaff, & Altman, 2009), the Cochrane Handbook for Systematic Reviews (Higgins & Green, 2011), and the framework for conducting scoping studies (Levac, Colquhoun, & O'Brien, 2010).

Data Sources and Search Terms

The comprehensive search strategy consisted of electronic searches of databases including Academic Search Premier, CINAHL Plus, MEDLINE, Ovid, PsycINFO, and PubMed. Additional papers were included using the reference lists in the records meeting inclusion criteria. The terms used in the search and their combinations are illustrated in Table 1.

Table 1

Search Terms

Primary Terms	Secondary Terms	Tertiary Terms
'antepartum'	'readiness'	'health outcomes'
'intrapartum'	'information'	'anxiety'
'postpartum'	'teaching'	'depression'
AND 'hospital discharge'	'concerns'	'service utilization'
		'follow-up care'

Electronic databases were searched using the primary terms 'antepartum' AND 'hospital discharge,' or 'intrapartum' AND 'hospital discharge,' or 'postpartum' AND 'hospital discharge' in combination with a secondary term associated with readiness, related information needs, teaching, and concerns, and a tertiary term corresponding to post-discharge outcomes. The secondary terms were selected based on what has been identified in previous studies as factors influencing readiness for postpartum discharge (Bowman, 2005; Madden et al., 2004; Weiss et al., 2006). The tertiary terms are those identified as outcomes experienced after postpartum discharge (Brumfield et al., 1996; Fishbein & Burggraf, 1998; Lieu et al., 2000; Weiss & Lokken, 2009). Every combination of primary, secondary, and tertiary terms were used for the searches. Additionally, 'apply related words' was selected for each search and included broad categories such as patient discharge, length of stay, postnatal period, risk factors, maternal and infant welfare, and medical care, as well as specific groupings including breastfeeding, maternal anxiety, postpartum depression, maternal adjustment, and sociodemographic factors.

Inclusion Criteria and Selection of Articles

Full-text articles were included if the following inclusion criteria were met: published in the English-language; peer reviewed journals from 2004 to 2014; research conducted with mothers experiencing uncomplicated births defined by going home with their infant within four days after birth; and included a higher income country given the differences in availability and accessibility of health services among higher and lower income countries (World Bank, 2014). Articles included in the review were not limited in study design but required original data analysis and needed to be relevant, even if the factors associated with postpartum readiness for hospital discharge and outcomes were not the focus of the study.

The selection of articles is outlined in Figure 1. In the first phase, 3,591 articles were identified in the electronic databases used, and an additional 12 papers were found using the articles' reference lists. In the second and third phases, review for inclusion was conducted at the abstract and full-text level, respectively. From the 2,931 articles reviewed at the abstract level, 124 full-text articles were assessed for eligibility and from these articles, 108 were excluded. Once an article was excluded, it was not subject to review for additional sequential reasons. The sequential exclusions include: 1) non-English language publications (n=38); 2) outside of the 2004-2014 year range (n=537); 3) non-peer reviewed publications (189); 4) publication did not include original data (n=358); 5) reported on complicated births or on infants in the Neonatal Intensive Care Unit (n= 876); 6) low- or low-to-middle income countries (n=89); and 7) publication did not address postpartum hospital discharge and related outcomes (n=972).

Figure 1. Flow Diagram of Review

Sixteen articles were included in the scoping review to further identify gaps in the research and to summarize the findings. A scoping review helps inform a systematic review in exploring the extent of the literature in a particular area of interest and to assist in identifying appropriate parameters of the review (Levac et al., 2010). The framework

for performing the scoping review included: clarifying the systematic review questions, research questions, and purpose of the review. The scoping review further guided the identification of pertinent studies based on inclusion and exclusion criteria, extraction of data consistent with the research questions and purpose, and the analysis and meaning of the findings while consulting with stakeholders to discuss how to integrate the information within the overall systematic review. The articles included in the current study derived from the scoping review revealed the various factors that impact hospital discharge readiness in the antepartum, intrapartum, and postpartum periods and the corresponding outcomes which helped identify specific research questions for the literature review.

Three reviewers conducted dual independent reviews at the full-text level and the scoping review level. At the full-text level, there was 96% acceptable agreement for inclusion and at the scoping review level, there was 91% agreement for inclusion. Any inclusion discrepancies were discussed and resolved using group consensus.

Data Extraction

Relevant data to the key questions were extracted by three reviewers from each article in the scoping review. A number of patient attributes, health care provider practices, and hospitalization characteristics were extracted to examine possible factors correlating with readiness for hospital discharge and post-discharge outcomes. Articles were also examined for discrepancies among individual, provider, hospital, and other factors. If reviewers were unclear of the results, verification would occur with at least one expert in the field before finalizing the findings.

Quality Assessment

Based on the results of the scoping review, seven articles met the overall quality of evidence using the Grading of Recommendations Assessment Development and Evaluation (GRADE) approach (Guyatt et al., 2011). As recommended by the Cochrane Handbook for Systematic Reviews of Interventions, the GRADE approach was used to evaluate each study based upon five factors which decrease the quality of evidence including limitations in the design and likelihood of bias, indirectness, inconsistency, imprecision of results, and publication bias, as well as three factors increasing the quality level of evidence, a large effect magnitude, plausible confounding biases demonstrating an effect, and the dose-response relationship (Table 2).

Table 2

GRADE Quality of Evidence Definitions

Factors decreasing and increasing the quality of evidence	
Limitations in design	The design and implementation of available studies includes risk of biases such as selection bias, measurement bias and failure to control confounding factors.
Indirectness	The available evidence is different from the question addressed in the systematic review and includes populations, interventions, controls, and outcomes that do not address the question.
Inconsistency	Findings and associations across the studies are inconsistent with results including problems with subgroup analysis suggesting differences in cause-effect relationships.
Imprecision of results	Few participants in the study resulting in wide confidence intervals surrounding the effect.
Publication bias	Over- or under-reporting of an effect due to the selective publications of study.
Factors increasing the quality of evidence	
Large effect magnitude	The larger the effect, the stronger the evidence resulting from a methodologically-strong study.
Plausible confounding biases	Confounding biases reduce a demonstrated effect; the exposure effect may be larger than the data suggests.
Exposure-response relationship	Situations when all reasonable biases would decrease the magnitude of the effect.

Data Analysis

The systematic review included seven articles that were heterogeneous in objectives, research design using both quantitative and qualitative methods, and outcomes. For each article, the year, study aims, research design/method, sample, outcome measures, and themes were identified and tabulated. Conclusions were drawn based on an aggregative synthesis of results with a narrative review of the evidence to further identify themes congruent with the concepts in the conceptual framework in each article surrounding the antepartum, intrapartum, and postpartum periods. The written assessments were reviewed by all reviewers for consideration of the results.

Results of Systematic Literature Review

Results of the seven articles that met the criteria for inclusion were assessed and are summarized in Table 3. The seven articles reported data and analysis on factors related to readiness for hospital discharge in at least one of the antepartum, intrapartum, and postpartum periods and its relationship to post-discharge outcomes (Bernstein et al., 2013; Bernstein et al., 2007; Britton, 2005; Dennis, Janssen, & Singer, 2004; Sword & Watt, 2005; Watt, Sword, & Krueger, 2005; Weiss & Lokken, 2009). The majority of the studies used a large sample size with diverse characteristics across different health and social services. Two studies used data from the Life Around Newborn Discharge (LAND) study of 4300 mother-infant dyads across the United States (Bernstein et al., 2013; Bernstein et al., 2007); one study used data from a longitudinal study involving 594 mothers in a health region near Vancouver, BC (Dennis et al., 2004); two studies used data from The Ontario Mother and Infant Survey (TOMIS I and TOMIS II) of 1250

eligible mothers from five hospitals across Ontario Canada (Sword et al., 2005; Watt et al., 2005); and two studies used data from single hospital sites in the United States recruiting over 1,000 eligible mothers combined (Brittton et al., 2005; Weiss et al., 2009). Data from these studies were collected using quantitative methods via questionnaires (n=7), exploration of medical records (n=1), and qualitative methods by conducting telephone interviews (n=3).

The aims of the studies included the exploration of decision-making regarding unreadiness for discharge and the potential consequences providing further insight on postpartum women's experiences with readiness for discharge (Bernstein et al., 2013; Bernstein et al., 2007); the prevalence and correlates of maternal postpartum anxiety including discharge readiness (Britton, 2005); predictors of depressive symptomatology which involved lack of readiness for hospital discharge (Dennis et al., 2004); women's concerns at hospital discharge and unmet learning needs (Sword et al., 2005); factors associated with accepting a longer length of stay in the postpartum and impact on post-discharge health status (Watt et al., 2005); and the predictors and outcomes from postpartum hospital discharge (Weiss et al., 2009).

Analysis of the seven papers revealed five main themes in relation to factors associated with postpartum readiness in the antepartum, intrapartum, and postpartum periods: 1) Maternal sociodemographic characteristics (n=3); 2) Prenatal characteristics (n=2); 3) Hospitalization factors (n=6); 4) Postpartum characteristics (n=5); and 5) Provider characteristics (n=4). Three main themes emerged regarding post-discharge outcomes related to these factors and include: 1) Healthcare utilization (n=4); 2)

Maternal symptoms (n=5); and 3) Overall maternal health status (n=4). Similar themes were found across all articles.

Table 3

Systematic Review of Characteristics Contributing to Postpartum Readiness and Impact on Outcomes

Authors (date) Country	Aim	Research Design/Method	Sample	Outcome Measures	Themes *
Bernstein et al. (2013) USA, Canada	Explore the potential consequences of unreadiness for both mother and infant	Prospective observational cohort study •Questionnaire	n= 4300 mother- infant dyads mothers: mean age 28 years old, 41% primigravidas, 41% minorities, 16% deemed unready for discharge by either mother, pediatrician, or obstetrician n=451 practitioners	Day of discharge: maternal, pediatrician, obstetrician questionnaire Post-Discharge: maternal daily diary for 2 weeks: pediatrician questionnaire; health reported for infant; symptom days and health- related behaviors both mother and infant; and maternal physical and mental scores on Short Form Health Survey (SF- 12)	1-8
Bernstein et al. (2007) USA, Canada	Assess the decision- making process regarding mother and infant dyad unreadiness for discharge	Prospective observational cohort study •Questionnaire	n= 4300 mother- infant dyads mothers: mean age 28 years old, 41% primigravidas, 36% minorities, 16-17% deemed unready for discharge n=451 practitioners, mean age 42.9 years, 51% men, mean years of experience 12.8 years, 84% board certified	Day of discharge: maternal, pediatrician, obstetrician questionnaire	1-8

Authors (date) Country	Aim	Research Design/Method	Sample	Outcome Measures	Themes *
Britton, J. R. (2005), USA	Explore the prevalence and correlates of maternal postpartum anxiety	Cohort study •Questionnaire •Medical records	n=433 mothers, mean age 25, 68% Caucasian, 46% annual household income <10,000, 65% married, 48% primiparous, 79% delivered vaginally, 37% planned pregnancies, 97% received prenatal care, 56% attended prenatal classes, 62% met with baby's physician during pregnancy, and 76% had chosen a healthcare provider for the baby prior to discharge	Day of discharge: State Anxiety (State Scale of the State-Trait Anxiety Inventory [STAI]), stressful medical events (Peripartum Events Scale[PES]), and Inventory of Recent Life Events, additional questions: perceptions of discharge readiness, problems requiring longer stays than anticipated, and anticipatory care i.e. pregnancy planning, prenatal care, prenatal class attendance, choice of infant provider, and visits with infant provider	3, 7, 8

Authors (date) Country	Aim	Research Design/Method	Sample	Outcome Measures	Themes *
Dennis et al. (2004) Canada	Develop a multifactorial predictive model of depressive symptomatology in the first week of postpartum to allow for targeted screening procedures identifying women with postpartum depression	Longitudinal, population-based study •Questionnaire	n=594 mothers, mean age 29, 91% White, 90% married, 39% high school diploma, 36% income<US\$24,000, 44% primiparous, 74% delivered vaginally, 69% discharged home within 48 hours	One, four, and eight weeks after postpartum discharge: Depression (Edinburgh Postnatal Depression Scale [EPDS]), maternal personality traits (Vulnerable personality Style Questionnaire), self-esteem (Rosenberg's Self-Esteem Scale), psychosocial health of women (Antenatal Psychosocial Health Assessment [ALPHA]), life-events stressors (Tenant and Andrews life-events scale), maternal perceptions of global support (Social Provisions Scale), relation-specific social support (Social Provisions Checklist), maternal experiences of personal control during childbirth (Labour Agency Scale)	4, 5, 6, 7

Authors (date) Country	Aim	Research Design/Method	Sample	Outcome Measures	Themes *
Sword et al. (2005), Canada	Examine women's concerns at hospital discharge and unmet learning needs as self-identified at 4 weeks post-discharge	Cross-sectional survey •Questionnaire •Telephone interviews	n= 890 women completed telephone interview, mean age of women with income <\$20,000 26, mean age of women with >\$20,000 income 30, gestation mean 40 weeks, 44% first live birth, 61% married, 63% Canadian, 33% highest level of education < high school in <\$20,000 group and 38% completed university in >\$20,000 income group	Day of discharge: maternal questionnaire Four weeks post-discharge: telephone interview	3, 4, 7
Watt et al. (2005), Canada	Examine who was offered and who accepted an extended length of stay after an uncomplicated vaginal delivery and determine what factors were associated with offer, acceptance of this option, and impact on these decisions post-discharge health status and service utilization	Cross-sectional survey •Structured telephone interviews	n= 890 women in follow-up telephone interview, mean age 29, 40 weeks gestation, 43% first live birth, 78% married, 30% income= \$40,000-59,999, 81% Canadian, 30% highest-level of education at the University level	Ontario Mother and Infant Survey (TOMIS and TOMIS II)	1, 3, 6

Authors (date) Country	Aim	Research Design/Method	Sample	Outcome Measures	Themes *
Weiss et al. (2009), USA	Identify predictors and outcomes of mothers' perceptions of readiness for hospital discharge from postpartum	Correlational design •Questionnaires •Telephone interviews	n=129 women completed discharge data collection, mean age 29, Hollingshead 4 Factor Index of Social Status 43 (greater than median value of 33), 53% White, 64% married, 29% complete four years of college, 76% private payor, 61% multipara, 71% vaginal delivery, 68% breastfeeding	Day of discharge: Readiness for discharge (Readiness for Hospital Discharge Scale [RHDS]), quality of discharge teaching (Quality of Discharge Teaching Scale [QDTS]), Three weeks post-discharge: coping difficulty (Post-Discharge Coping Difficulty Scale [PDCDS]), service utilization post-discharge through telephone interviews	3-8

*Theme 1: Maternal sociodemographic characteristics. Theme 2: Prenatal characteristics. Theme 3: Hospital/Perinatal factors. Theme 4: Postpartum characteristics. Theme 5: Provider characteristics. Theme 6: Healthcare utilization. Theme 7: Maternal symptoms. Theme 8: Overall maternal health status/coping

Systematic Literature Review Discussion

The seven studies included in this systematic review each contributed results relevant to the identification of factors associated with readiness for hospital discharge in the transition from antepartum, intrapartum, and postpartum and the related post-discharge outcomes. Despite the variations in design used to answer specific questions relative to each study, the reviewed studies consistently demonstrated that the factors most frequently cited as influencing hospital discharge readiness occur in the intrapartum and postpartum periods. Mothers experiencing uncomplicated deliveries and maternal or newborn problems, having older pediatric practitioners who were parents and board-certified with more experience, the content needed, received, and the way in which

information was presented, significantly contributed to their readiness for hospital discharge. As a result, these factors had greater implications of post-discharge outcomes including decrease healthcare utilization, overall maternal physical and mental health stability, and post-discharge coping. Maternal and infant clinical problems associated with readiness for hospital discharge are consistent with previous studies and were associated with poor postpartum outcomes (Bernstien et al., 2002; Johnstone, Boyce, Hickey, Morris-Yatees, & Harris, 2001; Mertesacker, Bade, Haverkock, Pauli-Pott, 2004). This suggests the individual reaction to the labor experiences coupled with the interactions they have with certain providers and the educational exchanges in the hospital, influences mother's perceptions of readiness to be discharged from the hospital and the post-discharge outcomes they experience.

In the antepartum period, the studies suggest pre-existing maternal sociodemographic characteristics such as older multiparous mothers of the racial/ethnic majority with private insurance, without a known chronic illness, who took prenatal classes, and did not experience prenatal complications were associated with readiness for hospital discharge and experienced favorable post-discharge outcomes. This review supports other study findings of mothers with certain maternal sociodemographic characteristics requiring a closer evaluation for discharge readiness and post-discharge follow-up support for younger, primiparous mothers of low socioeconomic status of the racial/ethnic minority, with a public payor insurance, and who had no prenatal preparation (Friedman, Heneghan, & Rosenthal, 2009; Kurtz Landy, Sword, & Valaitis, 2009; Lichtenstein et al., 2004; Weiss et al., 2004).

In the postpartum period, length of stay, mothers intending to breastfeed, and satisfaction with infant feeding were significantly associated with readiness for hospital discharge impacting maternal symptoms, maternal physical health status, and health care utilization post-discharge. An analysis of infant feeding problems found this as a criterion-based measure of readiness for discharge in other studies (Biancuzzo, 1997; Madden et al., 2003; Weiss et al., 2004). These findings address the ability to breastfeed, feeding problems, and plans to engage in breastfeeding as a predictor of discharge readiness and outcomes. The findings from this study suggest that longer lengths of stay was a determinant of discharge readiness and post-discharge outcomes, however other studies have suggested it is not an independent predictor of discharge readiness and changes in length of stay, either shorter or longer, are not as important as what occurs in the hospital to impact health care or utilization outcomes (Danielsen et al., 2000; Madden et al., 2004).

Overview of Problem and Purpose

Readiness for discharge is traditionally determined by the medical team after review of the mother's ability to care for herself and her infant. However, perceptions of readiness prior to hospital discharge can differ among health care providers and mothers. Few studies have analyzed the factors influencing mothers' readiness for hospital discharge and the related post-discharge complications, furthermore, the majority of studies examine factors associated with readiness for hospital discharge in the postpartum period and do not take into consideration factors in the antepartum and intrapartum periods influencing readiness for discharge (Beger & Cook, 1998; Bowman, 2005; Buchala, 2000; Malkin, Garber, Broder, & Keeler, 2000; Madden et al., 2004; Weiss,

Ryan, Lokken, 2006; Weiss, Ryan, Lokken, & Nelson, 2004). Discharge teaching to promote mothers' readiness for discharge also warrants a closer investigation as it influences the transition from one level of care to the next (Institute of Medicine [IOM], 2001). Additionally, the impact of readiness for hospital discharge on post-discharge outcomes has not been well understood and studies have focused on self-selected, special populations whose findings may not be generalizable to the broader childbearing population (Britton et al., 2002; Brumfield et al., 1996; Gazmarian et al., 1997; Grullon & Grimes, 1997; Fishbein & Burggraf, 1998; Lieu et al., 2000). Therefore the purpose of this investigation was to explore the antepartum, intrapartum, and postpartum factors, including the quality of discharge teaching, influencing the relationship between readiness of hospital discharge and the post-discharge outcomes

Specific Aims

To accomplish this purpose, the specific aims of this investigation include:

Systematically review the antepartum, intrapartum, and postpartum factors and outcomes associated with readiness for discharge.

1. Formulate a conceptual framework to guide the study and review of the literature.
2. Identify the antepartum, intrapartum, and postpartum factors that are predictive of postpartum mothers' perceptions of readiness for hospital discharge.
3. Explore the relationship between readiness for discharge perceptions between postpartum mothers and nurses.
4. Examine the differences in postpartum mothers' perceptions of the quality of discharge teaching following birth compared to four weeks post-discharge.

5. Investigate postpartum mothers' perceptions of readiness for hospital discharge after birth to predict post-discharge coping difficulty and utilization of support and health services.

Conceptual Framework

Sister Callista Roy's *Adaptation Model* of nursing and Afaf Ibrahim Meleis' *Transition Theory* provided the framework of concepts that are relevant in identifying the readiness for discharge factors as mothers adapt to the transitions from antepartum, intrapartum, and postpartum to home. The concepts of the *Adaptation to Transitions* conceptual framework were supported in the literature and were used to provide the background of empirical research on the study topic, identify variables of interest for the study, and guide the research method and analysis.

Individuals and groups are regarded as adaptive systems whose behavior is a response to environmental stimuli that changes in transitioning from one life phase or condition to another (Meleis, Sawyer, Im, Messias, & Schumacher, 2000; Roy, 2009). The concepts in the adaptation model serve to identify factors associated with the dynamic nature of transitions in the health care environment, the coping transition processes, and the results of care. The concepts in the transition theory define the transitional processes influencing discharge readiness in the antepartum, intrapartum, and postpartum periods. The major concepts of the three transition periods in the *Adaptation to Transitions* conceptual framework are summarized in Table 4.

Table 4

Major Concepts in the Adaptation to Transitions Conceptual Framework

Antepartum	Intrapartum	Postpartum (discharge and post-discharge)
<u>Nature of Transition:</u> Type-Admission to hospital Pattern-Complexity of admission	<u>Transition Conditions:</u> Hospitalization factors	<u>Patterns of Response:</u> Process and outcome adaptation modes
<u>Environmental Stimuli:</u> Focal-Family support Contextual-Patient characteristics Residual-Cultural beliefs/ethnicity	<u>Coping Processes:</u> Regulator-neural, chemical, endocrine channels during birth Cognator-perceptual, learning, content needed Stabilizer-mode of delivery Innovator-coping ability	<u>Modes of Adaptation:</u> Physiological-vital signs, laboratory values Self-concept-personal status feelings Role function-knowledge of mothering role Interdependence-interpersonal relationships; social support

The first major concept in the *Adaptation to Transitions* conceptual framework is present in the antepartum period describing the nature of transition-types and patterns influenced by three types of stimuli-focal, contextual, and residual influencing a mother's ability to cope with the environment (Roy, 2009; Meleis, 1997). The type of transition is the admission to the hospital and the pattern of transition includes the complexity of the admission. Here, the focal stimulus is the most immediate internal or external factor contributing to the mother's response such as family support. The contextual stimuli include all other factors contributing directly to the responses such as patient characteristics. The residual stimulus symbolizes the mother's cultural beliefs or practices that may influence the mother's decisions.

The second major concept in the conceptual framework is described in the intrapartum period including the transition conditions. Transition conditions are

circumstances influencing the way in which the mother moves through intrapartum to postpartum and is impacted by the coping processes that can facilitate or hinder progress towards achieving a healthy transition (Schumacher & Meleis, 1994). Mothers use mechanisms to filter environmental stimuli called the regulator, cognator, stabilizer, and innovator coping processes. The regulator coping process functions primarily through the neural, chemical, and endocrine channels processing stimuli during birth. The cognator coping process encompasses four cognitive-emotive channels for processing perceptual, learning, and judgment stimuli such as the educational content needed. The stabilizer coping process represents the accomplishment of a purpose indicated as an effective delivery and the innovator coping process focuses on the mechanisms by which the mother's role changes represented as coping ability.

The third major concept in the conceptual framework includes patterns of response which are conceptualized and influenced by process and outcome modes of adaption in which responses to environmental stimuli are expressed in patient's behaviors in the postpartum period at discharge and post-discharge. The physiological mode of adaptation involves the mother's biological responses and focuses on the basic elements needed to function such as vital signs. The self-concept mode includes a mother's feelings about her body and personal status. The role function mode describes knowledge of the mothering role. The interdependence mode of adaptation emphasizes interpersonal relationships and giving and receiving of social support.

The fourth major concept in the *Adaptation to Transitions* conceptual framework includes nursing therapeutics or interventions involved in managing the transition to home. The first measure that is applicable to a therapeutic nursing intervention is

proposed as the assessment of readiness for discharge. The second measure includes education as the primary intervention for creating optimal conditions in the preparation for discharge. The third measure includes role supplementation conceptualized as a deliberate process in the delivery of information that assists mothers in acquiring the knowledge needed to care for their infants and for themselves. The *Adaptation to Transitions* conceptual framework is presented in Figure 2.

Figure 2. The Adaptation to Transitions Conceptual Framework

Research Methods

Design and Setting

The descriptive correlational repeated measure design study was conducted in a 72-bed postpartum unit with mother-baby couplet care in a non-profit women's specialty hospital located in southern California. The hospital is part of a larger healthcare system that was designated the Malcolm Baldrige National Quality Award for performance excellence (The National Institute of Standards and Technology [NIST], 2014). The

postpartum unit recently installed a computer-based interactive patient care system to assist with providing postpartum mothers discharge education.

Population/Inclusion Criteria

To achieve the goal of purposive sampling of postpartum women experiencing uncomplicated birth events, English- and Spanish- speaking patients were recruited during their postpartum hospital stay if they met the following study inclusion criteria: (1) at least 18 years of age, (2) uneventful post-birth experience as evidenced by discharge home with the infant, (3) mothers with infants who were not transferred to the Neonatal Intensive Care Unit (NICU). In order to allow inclusion of patients of all levels of literacy, items were read verbatim and responses recorded by the Principal Investigator (PI) or Co-investigators. The nurse sample was a convenience sample of nurses caring for the mother on the day of discharge.

A prior power analysis to reduce the risk for Type II errors was completed and it was determined that a sample size of 174 postpartum mothers was estimated for a two-tailed test $\alpha = .05$, to achieve a power of at least 80% in multiple regression analyses with up to 10 predictor variables at a moderate effect size (Polit & Beck, 2012). The sample size needed of postpartum mothers and registered nurses is 88 for a two-tailed test $\alpha = .05$, to achieve a power of at least 80% in a Spearman's correlation at a medium effect size (Polit & Beck, 2012).

Measures and Reliability/Validity

Three scales were developed and tested in the postpartum patient population (Weiss & Piacentine, 2006). The Readiness for Discharge Scale (RHDS)-New Mother Forms was used to measure the mothers' and nurses' perceptions on readiness for

hospital discharge, the Quality of Discharge Teaching (QDTS) measured educational preparation for discharge, and the Post-Discharge Coping Difficulty Scale (PDCDS) measured coping difficulty. Data was collected on patient demographics using a demographic questionnaire.

Demographic Questionnaire. An 11-item demographic questionnaire using concepts derived from the *Adaptation to Transition* conceptual framework and the review of the literature included: (1) antepartum factors i.e. nature of transition: previous admission for a birth, infant's gestational age, and environmental stimuli: age, race/ethnic group, living with father of the baby, highest level of education, employment status; (2) intrapartum factors i.e. hospitalization factors: mode of delivery, maternal and infant length of stay; (3) postpartum factors i.e. feeding method. Table 5 illustrates the type of variable and measurement level of all demographic variables.

Table 5

Type of Variable and Measurement Levels of Demographic Variables

Type	Demographic Variable	Measurement Level
Independent Variables	Age	Ratio
	Race/Ethnicity	Nominal
	Marital status	Nominal
	Level of education	Ordinal
	Employment status	Ordinal
	Number of children	Ordinal
	Mode of delivery	Nominal
	Mother's length of stay	Ratio
	Feeding method	Nominal

Type	Demographic Variable	Measurement Level
	Infant length of stay	Ratio
	Gestational age	Ratio

Readiness for Hospital Discharge Scale-New Mother Form. The RHDS-New Mother Forms is a 23-item instrument including 21 items from a master version of the RHDS developed for patients' assessments of discharge readiness from acute care facilities. The items on the readiness scale include content worded specifically for the postpartum mother patient population. Twenty-two items form four subscales including personal status, knowledge, coping ability, and expected support and one single dichotomous item inquiring about whether or not the mother was ready to be discharged. These items are congruent with the conceptual framework components, in particular the intrapartum period, i.e. coping process, and the postpartum period, i.e. patterns of response and modes of adaptation. An additional open-ended question was included in the instrument requesting additional thoughts regarding the mothers' readiness for hospital discharge. The RHDS-New Mother Form is a self-reported summated 11-point rating scale (0-10) with anchor words such as, "not at all," "extremely well," to cue the participant into the meaning of the numeric scale. Higher scores on the scale indicate greater readiness for discharge. The reading level of the instrument is a grade level of 7.3 (Microsoft Word 2003, Flesch-Kincaid Grade Level Score). Construct validity using confirmatory factor analysis and contrasted group comparisons, and predictive validity were supported for the 22-item scale (Weiss et al., 2006). The Cronbach's α reliability coefficients was determined to be 0.89.

Readiness for Hospital Discharge Scale-New Mother Form-RN. The RHDS-New Mother Form-RN is also a 23-item instrument with similar questions as the RHDS-New Mother Form, however reworded for the RN to assess the mothers' readiness for discharge. The 23 items form the same four subscales and the single dichotomous item inquiring about whether or not the mother is ready to be discharged. These items also correspond to the *Adaptation to Transition* conceptual framework intrapartum and postpartum components. The RHDS-New Mother Form uses the same scaling format and anchor words where higher scores on the scale indicate greater readiness for discharge. Validity has not been reported for the RHDS-New Mother Form-RN instrument. The Cronbach's α reliability coefficients for the RHDS-New Mother Form-RN was calculated to be 0.89.

Quality of Discharge Teaching Scale. The QDTS instrument consists of 19 items and uses a similar scaling format to the RHDS with higher scores indicating greater quality of discharge teaching. An exploratory factor analysis of the QDTS identified a two-factor structure (content and delivery) accounting for 54.2% of scale variance (Weiss et al., 2006). The instrument consists of three subscales. The content subscale consists of seven paired items representing the amount of "content needed" and "content received" during teaching preparation for discharge and corresponds to the coping processes and modes of adaptation concepts in the conceptual framework. The 12-item "delivery" subscale represents the skill of the nurses as educators in providing discharge teaching correlating with the nursing therapeutics/intervention component of the conceptual framework. An additional open-ended question was included in the

instrument requesting additional thoughts regarding the quality of discharge teaching. The Cronbach's α reliability coefficients was 0.87.

Post-Discharge Coping Difficulty Scale. Ten of the 14 items on the PDCDS uses the same scaling format as the RHDS and QDTS with higher scores indicating a greater coping difficulty. The content domains are consistent with postpartum patterns of responses and modes of adaptation in the conceptual framework appropriate to the postpartum mother's situation post-discharge from the hospital. Attributes of post-discharge coping include items related to stress, recovery, self-care, and infant care management, family difficulty, assistance and emotional support, confidence, and adjustment. Specifics regarding these attributes are expressed in the form of open-ended questions. Exploratory factor analysis indicated a single dominant factor account for 39% of scale variance. Cronbach α reliability coefficients for the PDCDS was 0.88.

The remaining four dichotomous items on the PDCDS collect self-reported data on the utilization of support and health services. The following occurrences include: calls to healthcare providers regarding maternal or infant problems experienced, calls to the hospital, office or clinic visits due to maternal or infant problems experienced, and urgent care/emergency room visits. This data is congruous with patterns of response outcome measures and modes of adaptation post-discharge. Table 6 outlines the type of variable and measurement levels of the RHDS, QDTS, and PDCDS instruments.

Table 6

Type of Variable and Measurement Levels of Instruments

Type	Instrument	Measurement Level
Independent/ Dependent Variables	Readiness for Hospital Discharge Scale (RHDS)- New Mother Form	22 items: Interval 1 item: Dichotomous
	Readiness for Hospital Discharge Scale (RHDS)- New Mother Form-RN	22 items: Interval 1 item: Dichotomous
	Quality of Discharge Teaching Scale (QDTS)	19 items: Interval
Dependent Variables	Post Discharge Coping Difficulty Scale (PDCDS)	10 items: Interval 4 items: Dichotomous
	Utilization of support/health care services	

Data Collection Procedures

During postpartum hospitalization, postpartum subjects were recruited after the introduction of the research project by the PI or Co-investigators, 24 hours prior to discharge from the postpartum unit. The demographic, the RHDS-New Mother Form, and the QDTS data were obtained by the investigator on subjects who met the inclusion criteria. Each participant was asked to: 1) read or will be provided assistance with reading the California Subjects' Bill of Rights and Introductory Letter; 2) complete or was provided assistance with completing the research instruments (implying consent to participate) and the demographic form (nurses did not have a demographic form) by reading items verbatim and recording all responses. Nurse subjects were recruited from the population of nurses working in the postpartum unit whose patient(s) completed the forms. The RHDS-New Mother Form-RN data was collected by the registered nurse who was responsible for discharging the patient. Only numerical identifiers were used to link

the demographic survey with the study instruments and to link the mothers' responses to the discharge nurses' responses. The numeric code was not matched to the mother or to the nurse. There were no personal identifiers on any study data collection tool.

The PDCDS and utilization of support and health services questions were collected four weeks post-discharge on the postpartum subjects who completed the forms in the hospital. The QDTS was also completed at this time to examine if there was a difference in perceptions of discharge preparation once the patient was home. Assistance with reading the forms and transcribing responses verbatim prior to discharge was offered to the postpartum subjects.

Data Analysis Plan

Quantitative data was analyzed using non-parametric descriptive statistics including frequency counts and percentages for categorical variables and means and standard deviations for continuous variables to describe the sample and study variables. Parametric inferential statistics was used to examine the relationships among study variables. The predictors of postpartum mothers' perceptions of readiness for hospital discharge and post-discharge coping was examined using simultaneous multiple linear regression. The predictor variables were entered simultaneously and grouped according to the antepartum, intrapartum, and postpartum concepts in the Adaption to Transitions conceptual framework. Two non-parametric measures, Spearman's rho and Wilcoxon signed-rank test, were used to identify differences in readiness for discharge among mothers and nurses and in postpartum mothers' perceptions with the quality of discharge teaching while in the hospital and four weeks post-discharge respectively. Descriptive and inferential statistical analyses were performed using IBM® Statistical Package for

the Social Sciences (SPSS) ® V21.0. Table 7 summarizes the statistical analysis plan.

Table 7

Research Questions and Corresponding Statistical Analysis

Research Question	Statistical Analysis and Presentation of Results
1. What antepartum, intrapartum, and postpartum factors including nursing practices are predictive of postpartum mothers' perceptions of readiness for hospital discharge?	Simultaneous multiple linear regression -B estimate, CI, p-value
2. Are there differences in readiness for discharge perceptions between postpartum mothers and nurses?	Spearman's correlation -Correlation coefficient, p-value
3. Are there differences in postpartum mothers' perceptions of the quality of discharge teaching following birth compared to four weeks postpartum?	Paired sample Wilcoxon signed rank test -p-value
4. What are the factors associated with post-discharge coping difficulty and utilization of support and health services?	<u>Post-discharge coping:</u> Simultaneous multiple linear regression- B estimate, CI, p-value <u>Utilization of support/health services:</u> Simultaneous multiple logistic regression- OR, CI, p-value

Thematic analysis was conducted for the open-ended responses received. This involved organizing the data and examining the text for patterns and ideas across all instruments to describe the phenomenon related to readiness for hospital discharge, discharge teaching, and post-discharge coping. The patterns/ideas were then coded into

categories or major constructs and were reviewed with additional input from other qualitative researchers to build and define the themes.

Methodological Assumptions/Limitations

The data sources for this investigation were based on postpartum mothers' perceptions regarding the discharge transition including perceptions of their readiness for discharge, the discharge teaching, post-discharge coping, and self-reports about health care utilization. The reports of perceptions reflect the mother's reality but may not represent the reality of the clinical environment or the actual teaching. Similarly, nurses' assessment of discharge readiness was different than perceived by the patients representing the nurse's reality.

Data for this investigation was collected from mothers who experienced an uncomplicated birth in a single hospital and therefore may not reflect the experiences of mothers in other health care facilities, birthing centers, locations, or those mothers who have experienced complications during birth and/or during postpartum. Accordingly, nurses who practice in other settings and locations may encounter a different organizational culture, different nursing ratios, and/or take care of patients with different demographics limiting the generalizability of results.

Protection of Human Subjects

The proposed investigation was submitted and reviewed by the Institutional Review Board (IRB) of the participating hospital and the University of San Diego. A waiver for consent was requested of the participating hospital's IRB since a signed consent would identify the mothers' and nurses' identities. Completed surveys indicated

consent. A waiver for consent was requested on the University of San Diego's IRB proposal as secondary data is being collected and examined.

Nursing Implications

The trajectory of influence in the antepartum, intrapartum, and postpartum periods of the childbirth experience suggests that each period plays an important role in readiness for discharge which is then associated with lower post-discharge complications and health care utilization. The findings from this study support the importance of discharge readiness as an intermediate outcome in the transition to discharge. Nurses and other health care providers may be able to utilize the results from this study to identify mothers at risk for discharge given certain antepartum, intrapartum, and postpartum characteristics and to implement specific interventions for maternal support along the continuum of care. Anticipatory interventions could effectively promote an easier transition in each phase and decrease the related adverse post-discharge outcomes. Quality of discharge teaching should also be continuously evaluated for its impact on discharge readiness particularly to those mothers exhibiting at-risk characteristics. This can foster self-confidence in the mother's readiness to take care of herself, the infant, and the family post-discharge.

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Antepartum, Intrapartum, and Postpartum Factors and Outcomes Associated with
Mothers' Readiness for Hospital Discharge: A Systematic Review

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Abstract

Background: Research suggests that women are at greater risk during pregnancy and childbirth of developing affective disorders from anxiety to postpartum depression leading to possible adverse outcomes after hospital discharge. The discharge process involves a keen assessment on the mother's ability to cope with family care needs after discharge that depends on her own physical and mental readiness for discharge. Few studies have analyzed factors of readiness for hospital discharge and less is known about its outcomes after discharge. The current study examined published research to identify the factors and outcomes associated with readiness for hospital discharge in the antepartum, intrapartum, and postpartum periods.

Methods: Articles were sourced from Academic Search Premier, CINAHL Plus, MEDLINE, Ovid, PsycINFO, and PubMed. The guidelines outlined in PRISMA, the Cochrane Handbook for Systematic Reviews, and the framework for conducting scoping studies were the methods used in this review. The GRADE guidelines were used to assess the quality of evidence of the articles in the scoping review.

Results: Seven studies examined the factors most frequently cited as influencing hospital discharge readiness with the majority occurring in the intrapartum period. Mothers experiencing uncomplicated deliveries/problems, having pediatric practitioners with certain characteristics, education content needed, presented, and received significantly contributed to their readiness for hospital discharge. These factors had greater implications of post-discharge outcomes including decrease healthcare utilization, overall maternal physical and mental health stability, and post-discharge coping.

Conclusion: Identifying mothers at risk for discharge unreadiness in the antepartum, intrapartum, and postpartum periods is critical to implement specific interventions that ensure quality care.

Introduction and Background

Pregnancy and childbirth are significant events in the lives of women and their families but oftentimes are marked with distress during pregnancy and the postpartum period (Britton, 2007; Stock & Lynch, 2000). The discharge decision-making process involves careful judgments that depend on a mother's own physical and mental readiness and knowledge regarding how to care for herself and a new baby projecting the ability to cope with family care needs after discharge.

Hospital discharge from postpartum before a mother is physically and/or psychologically ready, places the mother and infant at a greater risk of detrimental maternal and infant health outcomes, increase use of health services, and the adoption of poor behaviors during the postpartum period (Bernstein et al., 2002; Margolis, Kotelchuck, & Chang, 1997). Additionally, the readiness and preparation for hospital discharge became a national concern with the passage of the New Mothers' Health Protection Act in 1996, shortening the length of hospital stay to 48 hours after vaginal deliveries and 96 hours after cesarean deliveries (Eaton 2001; General Accounting Office 1996; Secretary's Advisory Committee on Infant Mortality, 2001). As a result, the American Academy of Pediatrics (AAP) on hospital stays for healthy term newborns enacted a policy statement in 2010 highlighting that the physical, psychological, and social well-being of mother and infant must be assessed when discharge planning takes place (AAP, 2010).

Although few studies have analyzed factors of postpartum readiness for hospital discharge and post-discharge complications, the majority address factors associated in the postpartum period, such information needed prior to discharge, and do not take into

consideration the antepartum and intrapartum factors associated with readiness (Beger & Cook 1998; Bowman, 2005; Buchala, 2000; Malkin, Garber, Broder, & Keeler, 2000; Madden et al., 2004; Weiss, Ryan, Lokken, 2006; Weiss, Ryan, Lokken, & Nelson, 2004). Additionally, the impact of readiness for hospital discharge on post-discharge outcomes has not been well understood and studies have focused on self-selected, special populations whose findings may not be generalizable to the broader childbearing population (Britton et al., 2002; Brumfield et al., 1996; Gazmarian et al., 1997; Grullon & Grimes, 1997; Fishbein & Burggraf, 1998; Lieu et al., 2000). A systematic examination of the research in this area has not been previously conducted rendering additional research necessary to inform practice and policy regarding the factors and outcomes associated with mother's readiness for hospital discharge. Therefore, the purpose of the present study was to systematically review existing research on factors contributing to readiness for hospital discharge in the antepartum, intrapartum, and postpartum periods and the related post-discharge outcomes.

Considering that postpartum mothers who are not ready for discharge experience poor health outcomes and an increase in healthcare utilization, health care professionals should consider the full spectrum of factors shaping readiness for hospital discharge not only in the postpartum period but in the antepartum and intrapartum periods. The solution for improving health outcomes of these mothers and infants is a comprehensive identification of readiness factors at all phases of their pregnancy and birth trajectory to ensure they receive the necessary support and services to provide a safe and smooth transition along the continuum of their care and to further develop effective

infrastructures and policies to support these transitions between the outpatient setting, hospital, and home. This systematic review aims to identify as many factors associated with mothers' readiness for discharge in all three periods and the subsequent outcomes.

Methods

The approaches used in this systematic review were informed by guidelines outlined in the Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) (Moher, Liberati, Tetzlaff, & Altman, 2009), the Cochrane Handbook for Systematic Reviews (Higgins & Green, 2011), and the framework for conducting scoping studies (Levac, Colquhoun, & O'Brien, 2010).

Data Sources and Search Terms

The comprehensive search strategy consisted of electronic searches of databases including Academic Search Premier, CINAHL Plus, MEDLINE, Ovid, PsycINFO, and PubMed. Additional papers were included using the reference lists in the records meeting inclusion criteria. The terms used in the search and their combinations are illustrated in Table 1.

Table 1
Search Terms

Primary Terms	Secondary Terms	Tertiary Terms
'anteartum'	'readiness'	'health outcomes'
'intrapartum'	'information'	'anxiety'
'postpartum'	'teaching'	'depression'
AND 'hospital discharge'	'concerns'	'service utilization'
		'follow-up care'

Electronic databases were searched using the primary terms 'anteartum' AND 'hospital discharge,' or 'intrapartum' AND 'hospital discharge,' or 'postpartum' AND

‘hospital discharge’ in combination with a secondary term associated with readiness, related information needs, teaching, and concerns, and a tertiary term corresponding to post-discharge outcomes. The secondary terms were selected based on what has been identified in previous studies as factors influencing readiness for postpartum discharge (Bowman, 2005; Madden et al., 2004; Weiss et al., 2006). The tertiary terms are those identified as outcomes experienced after postpartum discharge (Brumfield et al., 1996; Fishbein & Burggraf, 1998; Lieu et al., 2000; Weiss & Lokken, 2009). Every combination of primary, secondary, and tertiary terms were used for the searches. Additionally, ‘apply related words’ was selected for each search and included broad categories such as patient discharge, length of stay, postnatal period, risk factors, maternal and infant welfare, and medical care as well as specific groupings including breastfeeding, maternal anxiety, postpartum depression, maternal adjustment, and sociodemographic factors.

Inclusion Criteria and Selection of Articles

Full-text articles were included if the following inclusion criteria were met: published in the English-language; peer reviewed journals from 2004 to 2014; research conducted with mothers experiencing uncomplicated births defined by going home with their infant within four days after birth; and included a higher income country given the differences in availability and accessibility of health services among higher and lower income countries (World Bank, 2014). Articles included in the review were not limited in study design but required original data analysis and needed to be relevant even if the factors associated with postpartum readiness for hospital discharge and outcomes were not the focus of the study.

The selection of articles is outlined in Figure 1. In the first phase, 3,591 articles were identified in the electronic databases used, and an additional 12 papers were found using the articles' reference lists. In the second and third phases, review for inclusion was conducted at the abstract and full-text level, respectively. From the 2,931 articles reviewed at the abstract level, 124 full-text articles were assessed for eligibility and from these articles, 108 were excluded. Once an article was excluded, it was not subject to review for additional sequential reasons. The sequential exclusions include: 1) non-English language publications (n=38) outside of the 2004-2014 year range (n=537); 3) non-peer reviewed publications (189); 4) publication did not include original data (n=358); 5) reported on complicated births or on infants in the Neonatal Intensive Care Unit (n= 876); 6) low- or low-to-middle income countries (n=89); and 7) publication did not address postpartum hospital discharge and related outcomes (n=972).

Figure 1. Flow diagram of review.

Sixteen articles were included in the scoping review to further identify gaps in the research and to summarize the findings. A scoping review helps inform a systematic review in exploring the extent of the literature in a particular area of interest and to assist

in identifying appropriate parameters of the review (Levac et al., 2010). The framework for performing the scoping review included: clarifying the systematic review questions; using the research questions and purpose to guide the identification of pertinent studies; selecting studies based on inclusion and exclusion criteria with different reviewers and regularly discussing uncertainties; extracting data that is consistent with the research questions and purpose; analyzing, reporting, and considering the meanings of the findings; and consulting with stakeholders to discuss preliminary findings and how to integrate the information within the overall systematic review. The articles included in the current study derived from the scoping review revealed the various factors that impact hospital discharge readiness in the antepartum, intrapartum, and postpartum periods and the corresponding outcomes which helped identify specific research questions for the literature review.

Three reviewers conducted dual independent reviews at the full-text level and the scoping review level. At the full-text level, there was 96% acceptable agreement for inclusion and at the scoping review level, there was 91% agreement for inclusion. Any inclusion discrepancies were discussed and resolved using group consensus.

Data Extraction

Relevant data to the key questions were extracted by three reviewers from each article in the scoping review. A number of patient attributes, health care provider practices, and hospitalization characteristics were extracted to examine possible factors correlating with readiness for hospital discharge and post-discharge outcomes. Articles were also examined for discrepancies among individual, provider, hospital, and other

factors. If reviewers were unclear of the results, verification would occur with at least one expert in the field before finalizing the findings.

Quality Assessment

Based on the results of the scoping review, it was determined that nine articles met the overall quality of evidence using the Grading of Recommendations Assessment Development and Evaluation (GRADE) approach (Guyatt, et al., 2011). As recommended by the Cochrane Handbook for Systematic Reviews of Interventions, the GRADE approach was used to evaluate each study based upon five factors which decrease the quality of evidence including limitations in the design and likelihood of bias, indirectness, inconsistency, imprecision of results, and publication bias as well three factors increasing the quality level of evidence, a large effect magnitude, plausible confounding biases demonstrating an effect, and the dose-response relationship (Table 2).

Table 2

GRADE Quality of Evidence Definitions

Factors decreasing the quality of evidence	
Limitations in design	The design and implementation of available studies includes risk of biases such as selection bias, measurement bias and failure to control confounding factors.
Indirectness	The available evidence is different from the question addressed in the systematic review and includes populations, interventions, controls, and outcomes that do not address the question.
Inconsistency	Findings and associations across the studies are inconsistent with results including problems with subgroup analysis suggesting differences in cause-effect relationships.
Imprecision of results	Few participants in the study resulting in wide confidence intervals surrounding the effect.
Publication bias	Over- or under-reporting of an effect due to the selective publications of study.
Factors increasing the quality of evidence	
Large effect magnitude	The larger the effect, the stronger the evidence resulting from a methodologically-strong study.

Factors decreasing the quality of evidence	
Plausible confounding biases	Confounding biases reduce a demonstrated effect; the exposure effect may be larger than the data suggests.
Exposure-response relationship	Situations when all reasonable biases would decrease the magnitude of the effect.

Current Study Data Analysis

The current study included seven articles that were heterogeneous in objectives, research design using both quantitative and qualitative methods, and outcomes. For each article, the year, study aims, research design/method, sample, outcome measures, and themes were identified and tabulated. Conclusions were drawn based on an aggregative synthesis of results with a narrative review of the evidence to further identify themes in each article surrounding the antepartum, intrapartum, and postpartum periods. The written assessments were reviewed by all reviewers for consideration of the results.

Results

Characteristics of Studies

Results of the seven articles that met the criteria for inclusion were assessed and are summarized in Table 3. The seven articles reported data and analysis on factors related to readiness for hospital discharge in at least one of the antepartum, intrapartum, and postpartum periods and its relationship to post-discharge outcomes (Bernstein et al., 2013; Bernstein et al., 2007; Britton, 2005; Dennis, Janssen, & Singer, 2004; Sword & Watt, 2005; Watt, Sword, & Krueger, 2005; Weiss & Lokken, 2009). The majority of the studies, used a large sample size with diverse characteristics across different health and social services. Two studies used data from the Life Around Newborn Discharge

(LAND) study of 4300 mother-infant dyads across the United States (Bernstein et al., 2013; Bernstein et al., 2007); one study used data from a longitudinal study involving 594 mothers in a health region near Vancouver, BC (Dennis et al., 2004); two studies used data from The Ontario Mother and Infant Survey (TOMIS I and TOMIS II) of 1250 eligible mothers from five hospitals across Ontario Canada (Sword et al., 2005; Watt et al., 2005); and two studies used data from single hospital sites in the United States recruiting over 1,000 eligible mothers combined (Brittton et al., 2005; Weiss et al., 2009). Data from these studies were collected using quantitative methods via questionnaires (n=7) and exploration of medical records (n=1) and qualitative methods by conducting telephone interviews (n=3).

The aims of the studies included the exploration of decision-making regarding unreadiness for discharge and the potential consequences providing further insight on postpartum women's experiences with readiness for discharge (Bernstein et al., 2013; Bernstein et al., 2007); the prevalence and correlates of maternal postpartum anxiety including discharge readiness (Britton, 2005); predictors of depressive symptomatology which involved lack of readiness for hospital discharge (Dennis et al., 2004); women's concerns at hospital discharge and unmet learning needs (Sword et al., 2005); factors associated with accepting a longer length of stay in the postpartum and impact on post-discharge health status (Watt et al., 2005); and the predictors and outcomes from postpartum hospital discharge (Weiss et al., 2009).

Analysis of the seven papers revealed five main themes in relation to factors associated with postpartum readiness in the antepartum, intrapartum, and postpartum periods: 1) Maternal sociodemographic characteristics (n=3); 2) Prenatal characteristics

(n=2); 3) Hospitalization factors (n=6); 4) Postpartum characteristics (n=5); and 5)

Provider characteristics (n=4). Three main themes emerged regarding post-discharge

outcomes related to these factors and include: 1) Healthcare utilization (n=4); 2)

Maternal symptoms (n=5); and 3) Overall maternal health status (n=4). Multiple themes

were identified in all seven papers.

Table 3

Systematic Review of Characteristics Contributing to Postpartum Readiness and Impact on Outcomes

Authors (date) Country	Aim	Research Design/Method	Sample	Outcome Measures	Themes *
Bernstein et al. (2013) USA, Canada	Explore the potential consequences of unreadiness for both mother and infant	Prospective observational cohort study • Questionnaire	n= 4300 mother-infant dyads mothers: mean age 28 years old, 41% primigravidas, 41% minorities, 16% deemed unready for discharge by either mother, pediatrician, or obstetrician n=451 practitioners	Day of discharge: maternal, pediatrician, obstetrician questionnaire Post-Discharge: maternal daily diary for 2 weeks: pediatrician questionnaire; health reported for infant; symptom days and health-related behaviors both mother and infant; and maternal physical and mental scores on Short Form Health Survey (SF-12)	1-8

Authors (date) Country	Aim	Research Design/Method	Sample	Outcome Measures	Themes *
Bernstein et al. (2007) USA, Canada	Assess the decision-making process regarding mother and infant dyad unreadiness for discharge	Prospective observational cohort study • Questionnaire	n= 4300 mother-infant dyads mothers: mean age 28 years old, 41% primigravidas, 36% minorities, 16-17% deemed unready for discharge n=451 practitioners, mean age 42.9 years, 51% men, mean years of experience 12.8 years, 84% board certified, 77% parents	Day of discharge: maternal, pediatrician, obstetrician questionnaire	1-8
Britton, J. R. (2005), USA	Explore the prevalence and correlates of maternal postpartum anxiety	Cohort study • Questionnaires • Medical records	n=433 mothers, mean age 25, 68% Caucasian, 46% annual household income <10,000, 65% married, 48% primiparous, 79% delivered vaginally, 37% planned pregnancies, 97% received prenatal care, 56% attended prenatal classes, 62% met with baby's physician during pregnancy, and 76% had chosen a healthcare provider for the baby prior to discharge	Day of discharge: State Anxiety (State Scale of the State-Trait Anxiety Inventory [STAI]), stressful medical events (Peripartum Events Scale[PES]), and Inventory of Recent Life Events, additional questions: perceptions of discharge readiness, problems requiring longer stays than anticipated, and anticipatory care i.e. pregnancy planning, prenatal care, prenatal class attendance, choice of infant provider, and visits with infant provider	3, 7, 8

Authors (date) Country	Aim	Research Design/Method	Sample	Outcome Measures	Themes *
Dennis et al. (2004), Canada	Develop a multifactorial predictive model of depressive symptomatology in the first week of postpartum to allow for targeted screening procedures identifying women with postpartum depression	Longitudinal, population-based study •Questionnaires	n=594 mothers, mean age 29, 91% White, 90% married, 39% high school diploma, 36% income<US\$24,000, 44% primiparous, 74% delivered vaginally, 69% discharged home within 48 hours	One, four, and eight weeks after postpartum discharge: Depression (Edinburgh Postnatal Depression Scale [EPDS]), maternal personality traits (Vulnerable personality Style Questionnaire), self-esteem (Rosenberg's Self-Esteem Scale), psychosocial health of women (Antenatal Psychosocial Health Assessment [ALPHA]), life-events stressors (Tenant and Andrews life-events scale), maternal perceptions of global support (Social Provisions Scale), relation-specific social support (Social Provisions Checklist), maternal experiences of personal control during childbirth (Labour Agency Scale)	4, 5, 6, 7
Sword et al. (2005), Canada	Examine women's concerns at hospital discharge and unmet learning needs as self-identified at 4 weeks post-discharge	Cross-sectional survey •Questionnaire •Telephone interviews	n= 890 women completed telephone interview, mean age of women with income <\$20,000 26, mean age of women with >\$20,000 income 30, gestation mean 40 weeks, 44% first live birth, 61% married, 63% Canadian, 33% highest level of education < high school in <\$20,000 group and 38% completed university in >\$20,000 income group	Day of discharge: maternal questionnaire Four weeks post-discharge: telephone interview	3, 4, 7

Authors (date) Country	Aim	Research Design/Method	Sample	Outcome Measures	Themes *
Watt et al. (2005), Canada	Examine who was offered and who accepted an extended length of stay after an uncomplicated vaginal delivery and determine what factors were associated with offer, acceptance of this option, and impact on these decisions post-discharge health status and service utilization	Cross-sectional survey •Structured telephone interviews	n= 890 women in follow-up telephone interview, mean age 29, 40 weeks gestation, 43% first live birth, 78% married, 30% income= \$40,000-59,999, 81% Canadian, 30% highest-level of education at the University level	Ontario Mother and Infant Survey (TOMIS and TOMIS II)	1, 3, 6
Weiss et al. (2009), USA	Identify predictors and outcomes of mothers' perceptions of readiness for hospital discharge from postpartum	Correlational design •Questionnaires •Telephone interviews	n=129 women completed discharge data collection, mean age 29, Hollingshead 4 Factor Index of Social Status 43 (greater than median value of 33), 53% White, 64% married, 29% complete four years of college, 76% private payor, 61% multipara, 71% vaginal delivery, 68% breastfeeding	Day of discharge: Readiness for discharge (Readiness for Hospital Discharge Scale [RHDS]), quality of discharge teaching (Quality of Discharge Teaching Scale [QDTS]), Three weeks post-discharge: coping difficulty post-discharge (Post-Discharge Coping Difficulty Scale [PDCDS]), service utilization post-discharge through telephone interviews	3-8

*Theme 1: Maternal sociodemographic characteristics. Theme 2: Prenatal characteristics. Theme 3: Hospital/Perinatal factors. Theme 4: Postpartum characteristics. Theme 5: Provider characteristics. Theme 6: Healthcare utilization. Theme 7: Maternal symptoms. Theme 8: Overall maternal health status/coping

Factors Associated with Readiness for Hospital Discharge and Post-Discharge Outcomes

The Antepartum Period.

Maternal Sociodemographic Characteristics. Certain maternal sociodemographic characteristics preceding and existing in the antepartum period were found to have a statistically significant relationship to hospital discharge. Unreadiness for hospital discharge was defined in two studies when more than one of three informants including mother, pediatrician, and obstetrician, perceived that the mother or infant should stay longer in the postpartum period. Maternal sociodemographic characteristics such as younger mothers, mothers with a known chronic illness, incomes below federal poverty level, minorities, and those with public or no insurance, were found to have a statistically significant association with hospital discharge (Bernstein et al., 2012; Bernstein et al., 2007). After controlling for maternal sociodemographic factors, factors of unreadiness that remained significant in predicting hospital readiness included age, race/ethnicity, having a known chronic disease, insurance, and parity (Bernstein et al., 2007; Weiss et al., 2009). Therefore, older multiparous mothers of the racial/ethnic majority, without a known chronic illness who have private insurance, have higher perceptions of hospital discharge readiness. Similarly, mothers of the ethnic majority, accepting a longer length of stay, who had a family physician, were the maternal sociodemographic characteristics that were significantly associated with readiness for hospital discharge in the antepartum period (Watt et al., 2005). In these studies, maternal education level was not associated with readiness of hospital discharge.

The related post-discharge outcomes of these factors in the antepartum period, were healthcare utilization, maternal symptom days including anxiety and depression, and overall maternal health status. Specifically, minorities and older mothers tended to have increased health care use and symptom days including lower physical and mental health indices and younger mothers were more likely to make calls to health care providers (Bernstein et al., 2012; Weiss et al., 2009). Maternal parity was also a predictor of the number of maternal symptoms days including anxiety, and having public or no health insurance was an independent predictor of calls to health care providers (Bernstein et al., 2012; Weiss et al., 2009). Maternal mental health was associated with calls to health providers and more maternal symptom days (Bernstein et al., 2012). Maternal education level was not associated with readiness for hospital discharge, but it was statistically significant with the number of health care visits (Bernstein et al., 2012). Post-discharge service utilization for mothers of the ethnic majority who had a family physician did not report higher health status changes or service utilization (Watt et al., 2005). An important confounder, maternal mental health, was associated with more calls to health providers and more maternal symptom days (Bernstein et al., 2012).

Prenatal Characteristics. Another significant factor associated with readiness for hospital discharge in the antepartum period were mothers who prepared themselves for birth by taking prenatal classes and those who did not experience prenatal complications (Bernstein et al., 2007). Pregnant women who had prenatal visits with a pediatric provider or who received adequate prenatal care were likely to be ready for discharge as were those who did not experience prenatal problems (Bernstein et al., 2007).

The related post-discharge outcomes of these factors in the antepartum period were healthcare utilization and maternal symptom days. Prenatal class attendance was a significant predictor of the number of calls to health care providers and number of maternal symptom days (Bernstein et al., 2012).

The Intrapartum Period.

Hospital/Perinatal Factors. The hospital/perinatal factors in the intrapartum period that were found to significantly contribute to hospital discharge readiness included time of delivery and neonatal/maternal problems (Bernstein et al., 2012; Bernstein et al., 2007; Britton, 2005; Watt et al., 2005). Mothers who did not experience complicated deliveries including labor greater than 12 hours as defined by patients, prolonged labor as defined by obstetricians, delivery during non-routine hours (7:00 pm to 7:00 am), experiencing other problems in the hospital, were more likely to be ready for hospital discharge (Bernstein et al., 2012; Bernstein et al., 2007; Britton, 2005). Mothers who did not have infants of lower birth weight, infants who had medical problems or signs of illness in the hospital, had significantly higher perceptions of discharge readiness (Bernstein et al., 2012; Bernstein et al., 2007; Watt et al., 2005). Mothers who had vaginal deliveries were more likely to be ready for hospital discharge compared to mothers who delivered with cesarean sections although the difference was not statistically significant in these studies.

The related post-discharge outcomes of these factors in the intrapartum period include calls to healthcare providers, maternal symptoms, and overall maternal health. Mothers reporting infant problems during hospitalization correlated strongly with postpartum maternal symptoms of anxiety (Britton, 2005). In another study, mothers'

perceptions of readiness for discharge due to uncomplicated deliveries were a predictor of overall maternal health and were reported as either excellent, very good, or good (Watt et al., 2005). Although cesarean delivery was not significantly associated with discharge readiness, it was a predictor of a greater number of calls to healthcare providers, poorer maternal physical health status, and routine and non-routine office or clinic visits with providers (Bernstein et al., 2012; Weiss et al., 2009).

Provider Characteristics. Provider characteristics in the intrapartum period that were significantly correlated with readiness for hospital discharge included the practitioner's age and number of years practicing, the practitioner's parental status, the practitioner's certification, content needed and content received by providers, and educational topics covered in the hospital (Bernstein et al., 2012; Bernstein et al., 2007; Sword et al., 2005; Watt et al., 2005; Weiss et al., 2009). Self-reported characteristics of pediatric practitioners revealed that mothers who had more experienced, older, board-certified practitioners who were parents, were associated with higher levels of hospital discharge readiness (Bernstein et al., 2007). The content mothers perceived as needed compared to the content they received, their unmet learning needs, and the way in which information was presented, significantly contributed to the readiness for hospital discharge (Watt et al., 2005; Weiss et al., 2009). Mothers who received a modest amount of information (one to four topics) covered by providers in the hospital were more likely deemed ready for discharge (Bernstein et al., 2012; Bernstein et al., 2007).

Related post-discharge outcomes of older pediatric practitioners with board certification in the intrapartum period was significantly associated with less calls to health care providers post-discharge but was not significantly associated with less

maternal symptom days or overall better maternal health (Bernstein et al., 2012). A nominal association was observed with physicians who were parents and less number of calls post-discharge. Post-discharge maternal coping was associated with the difference between the content needed and the content received, and the delivery of content by a provider which was associated with a greater likelihood of provider visits (Weiss et al., 2009). Mothers whose learning needs were met, reported favorable health outcomes post-discharge (Watt et al., 2005). The number of educational topics covered by providers was associated with calls to providers, number of visits, maternal physical and mental health status post-discharge (Bernstein et al., 2012).

The Postpartum Period.

Postpartum Characteristics. The immediate postpartum characteristics associated with hospital readiness for discharge include feeding method and length of stay (Bernstein et al., 2012; Bernstein et al., 2007; Dennis et al., 2004; Sword et al., 2005; Weiss et al., 2009). Women who were breastfeeding compared to women who were bottle-feeding immediately in the postpartum period were more likely to have unmet learning needs (Sword et al., 2005). Mothers not intending to breastfeed and mothers' satisfaction with infant feeding were significantly associated with readiness for hospital discharge (Bernstein et al., 2007; Dennis et al., 2004). Longer lengths of stay in postpartum was associated with readiness for hospital discharge (Bernstein et al., 2007).

The intent to breastfeed and satisfaction with infant feeding method was a significant predictor of maternal symptoms of depression and maternal physical health status (Bernstein et al., 2012; Dennis et al., 2004; Weiss et al., 2009). Length of stay in postpartum was significantly associated with number of maternal visits to providers,

number of symptom days, and maternal physical health status post-discharge (Bernstein et al., 2012).

Discussion

The seven studies included in this systematic review each contributed results relevant to the identification of factors associated with readiness for hospital discharge in the antepartum, intrapartum, and postpartum periods and the related post-discharge outcomes. Despite the variations in design used to answer specific questions relative to each study, the reviewed studies consistently demonstrated that the factors most frequently cited as influencing hospital discharge readiness occur in the intrapartum period. Mothers experiencing uncomplicated deliveries and maternal or newborn problems, having older pediatric practitioners who were parents and board-certified with more experience, the content needed, received, and the way in which information was presented, significantly contributed to their readiness for hospital discharge. As a result, these factors had greater implications of post-discharge outcomes including decrease healthcare utilization, overall maternal physical and mental health stability, and post-discharge coping. Maternal and infant clinical problems associated with readiness for hospital discharge are consistent with previous studies and were associated with poor postpartum outcomes (Bernstien et al., 2002; Johnstone, Boyce, Hickey, Morris-Yatees, & Harris, 2001; Mertesacker, Bade, Haverkock, Pauli-Pott, 2004). This suggests that the individual reaction to the labor experiences coupled with the interactions they have with certain providers and the educational exchanges in the hospital, influences mother's perceptions of readiness to be discharged from the hospital and the post-discharge outcomes they experience.

In the antepartum period, the studies suggest that pre-existing maternal sociodemographic characteristics such as older multiparous mothers of the racial/ethnic majority with private insurance, without a known chronic illness, who took prenatal classes and did not experience prenatal complications were associated with readiness for hospital discharge and experienced favorable post-discharge outcomes. This review validates other study findings of mothers with certain maternal sociodemographic characteristics requiring a closer evaluation for discharge readiness and post-discharge follow-up support such as younger, primiparous mothers of low socioeconomic status of the racial/ethnic minority, with a public payor insurance and no prenatal preparation, (Friedman, Heneghan, & Rosenthal, 2009; Kurtz Landy, Sword, & Valaitis, 2009; Lichtenstein et al., 2004; Weiss, Ryan, Lokken, & Nelson, 2004).

In the postpartum period, length of stay, mothers intending to breastfeed, and satisfaction with infant feeding were significantly associated with readiness for hospital discharge impacting maternal symptoms, maternal physical health status, and health care utilization post-discharge. An analysis of infant feeding problems revealed this as a criterion-based measure of readiness for discharge in other studies (Biancuzzo, 1997; Madden et al., 2003; Weiss, Ryan, Lokken, & Nelson, 2004;). These findings address ability to breastfeed, feeding problems, and plans to engage in breastfeeding as a predictor of discharge readiness and outcomes. The findings from this study suggest that longer lengths of stay was a determinant of discharge readiness and post-discharge outcomes, however other studies have suggested that it is not an independent predictor of discharge readiness and that changes in length of stay, either shorter or longer, are not as

important as what occurs in the hospital to impact health care or utilization outcomes (Madden et al., 2004; Danielsen, Castles, Damberg, & Gould, 2000).

Limitations of reviewed studies

The review sought to examine factors and outcomes associated with mothers' readiness for hospital discharge in the antepartum, intrapartum, and postpartum periods although not all studies reviewed defined readiness the same way and addressed factors in each of these periods. The studies either used different methods to define readiness or did not clearly define readiness at all. The studies defining readiness shared a common ground based on health status. The differences in definitions, followed by the different tools used to measure a readiness/unreadiness state, including other differences between samples, created complexity in interpreting evidence patterns for the review questions. For example, one study was based on a large patient sample of 4300 mothers where unreadiness was defined if one of three informants perceived that the mother should stay longer using a self-administered questionnaire whereas another study of 594 mothers, assessed readiness using the Antenatal Psychosocial Health Assessment (ALPHA) form. An additional barrier to reaching a clear conclusion was that some factors associated with readiness (e.g. parity, race), were used as covariates in analyses and the effects were not clearly examined for their contribution to readiness and subsequently post-discharge outcomes. Nonetheless the covariates considered in this review captured as many potential factors as realistically possible including perceived and actual support, maternal anxiety, postpartum depression, unmet learning needs, and perceived control of length of hospital stay. It may be beneficial for future studies to assess maternal health after

several months postpartum for a more complete evaluation of comparison at various time points.

Other limitations of the studies, include the volunteer bias of participating mothers which is difficult to assess considering that participating mothers' perceptions reflected their realities but may not represent the clinical reality or the reality of other health care providers. Further exploration regarding data collection on those perceived unready for discharge including the health care providers' influence on discharge readiness and outcomes is warranted to provide valuable information for decision-making about discharge readiness and post-discharge support.

Additionally, generalizability of results obtained from the participating mothers and health care providers is limited considering the demographic variables that should be comparable to a random contemporaneous sample with the same heightened concerns regarding discharge readiness and outcomes. Further research is needed to examine discharge readiness and outcomes of specific subgroups of women (e.g. more diverse or high-risk populations) outside of the medically low-risk healthy women and infants population after a vaginal delivery or cesarean section.

Implications for Clinical Practice

The trajectory of influence at each period of the childbirth experience, especially during the intrapartum period, suggests that each phase plays an important role in readiness for discharge which is then associated with lower post-discharge complications and health care utilization. These findings support the importance of discharge readiness as an intermediate outcome in the transition to discharge. Health care providers can utilize the results from this study to identify mothers at risk for discharge unreadiness in

the antepartum, intrapartum, and postpartum periods to implement specific interventions for maternal support along the continuum of care. However, individualized definitions of readiness from patients and families should be taken into consideration to enhance the provision of services mitigating the impact on health care outcomes and facilitating the identification of non-predetermined situations affecting readiness along with strategies for addressing them. Anticipatory interventions could effectively promote an easier transition in each phase and decrease the related adverse post-discharge outcomes. As a fundamental aspect of health care providers' practice, teaching should be incorporated during each phase to provide multiple opportunities for reinforcing discharge readiness content particularly to those mother exhibiting at-risk characteristics. This can foster self-confidence in the mother's readiness to take care of herself, the infant, and the family post-discharge. Assessment of the fixed maternal vulnerabilities paired with individualized patient care and education should not only be incorporated into daily practice but also in clinical guidelines and policies with local providers, hospitals, insurers, patients/families, and social agencies to improve the overall health and wellness of childbearing women.

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Manuscript #2

A Conceptual Framework to Investigate Antepartum, Intrapartum, and Postpartum
Factors Associated with Readiness for Hospital Discharge

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Abstract

Aims. The aim of this paper is to identify critical factors associated with hospital discharge readiness in the antepartum, intrapartum, and postpartum periods and to describe the nurses' role in discharge preparation in a new conceptual framework

Background. Hospital discharge from postpartum before a mother is physically and/or psychologically ready, places the mother and infant at a greater risk of detrimental maternal and infant health outcomes. A gap exists in the literature in identifying factors associated with discharge readiness in the three transitions of care. The foundation for the conceptual framework included a systematic literature review, scoping review, and a consensus study to develop and validate a conceptual framework to inform practice.

Design. Discussion paper.

Data Sources. The conceptual framework incorporates evidence from a systematic review (conducted May 2014), a scoping review (conducted in June 2014), and a consensus study (conducted July-October 2014) including perspectives of postpartum patients and families.

Implications for Nursing. A new *Adaptation to Transitions* framework includes a comprehensive identification of readiness factors at all phases of pregnancy and the birth trajectory and highlights the role of the nurse in preparing patients and families to ensure the necessary support and services are received to provide safe transitions of care.

Conclusion. Health care providers can utilize the *Adaptation to Transitions* conceptual framework to identify mothers at risk for discharge unreadiness in the antepartum, intrapartum, and postpartum periods, to implement specific interventions for maternal support along the continuum of care, and to guide future research.

Introduction

According to the World Health Organization (2009), preparation for hospital discharge after birth became a global concern when hospitals in many developing countries began implementing shorter lengths of stay for uncomplicated deliveries. In the United States, the passage of the Newborns' and Mothers' Health Protection Act in 1996, shortened the length of hospital stay to lengths previously considered to be "early discharge" (Eaton 2001; General Accounting Office 1996; Secretary's Advisory Committee on Infant Mortality, 2001). Although the purpose of the legislation was to protect mothers and infants, improve maternal and newborn outcomes, and reduce hospital readmissions, provisions to identify mothers who were ready for hospital discharge were not addressed. The trend towards shorter lengths of stay without adequate provisions to ensure readiness for hospital discharge has also been reported in 22 other countries (Gupta, Malhotra, Singh, & Dua, 2006).

Shorter lengths of stay have been associated with lower perceived readiness for discharge suggesting mothers' perceptions of readiness may not be taken into account in discharge timing decisions (Weiss et al., 2004). Hospital discharge from postpartum before a mother is physically and/or psychologically ready, places the mother and infant at a greater risk of detrimental maternal and infant health outcomes, increase use of health services, and the adoption of poor behaviors during the postpartum period (Bernstein et al., 2002; Margolis, Kotelchuck, & Chang, 1997). Furthermore, there is a spectrum of affective disorders that can occur during this time varying from anxiety to postpartum depression to severe psychosis leading to adverse outcomes after hospital discharge (Brockington, 2004). Readiness for discharge is traditionally determined by

the medical team after review of the mother's ability to care for herself and her infant. However, perceptions of readiness prior to hospital discharge can differ among health care providers and mothers. Few studies have analyzed the factors influencing mothers' readiness for hospital discharge; notably, the majority of these studies have examined factors associated with readiness for hospital discharge in the postpartum period and do not take into consideration factors in the antepartum and intrapartum periods influencing readiness for discharge (Beger & Cook, 1998; Bowman, 2005; Buchala, 2000; Malkin, Garber, Broder, & Keeler, 2000; Madden et al., 2004; Weiss, Ryan, Lokken, 2006; Weiss, Ryan, Lokken, & Nelson, 2004). As postpartum length of stay has decreased the need to identify the factors influencing readiness, have become increasingly important to the patient's physical, psychological, and social well-being.

Teaching to promote mothers' readiness for discharge also warrants a closer investigation as it can influence the care transition from one level of care to the next (Institute of Medicine [IOM], 2001). Moreover, the impact of teaching on readiness for hospital discharge and post-discharge outcomes has not been well understood and studies have focused on self-selected, special populations whose findings may not be generalizable to the broader childbearing population (Britton et al., 2002; Brumfield et al., 1996; Gazmarian et al., 1997; Grullon & Grimes, 1997; Fishbein & Burggraf, 1998; Lieu et al., 2000).

To prevent adverse post-discharge maternal and infant outcomes from occurring, efforts towards identifying factors associated with readiness for hospital discharge are needed. This can be achieved by considering patient characteristics or risk factors that can lead to substandard health after discharge. Given the potential in preventing

detrimental care outcomes and the numerous directions for future research, a conceptual framework highlighting the critical factors that influence discharge readiness in the antepartum, intrapartum, and postpartum periods and the impact of discharge teaching is essential. The conceptual framework would help to (1) place specific research ideas into a broader context, (2) identify important knowledge gaps, and (3) elucidate the complex interplay between mother characteristics, as well as the impact of cultural and societal factors and patient teaching on discharge readiness. Therefore this paper describes the development of a conceptual framework outlining the antepartum, intrapartum, and postpartum factors associated with readiness for hospital discharge and the nurses' role in discharge preparation to ensure safe outcomes after hospitalization.

Background

Patient Outcomes and Transitions of Care

Concerns about the adequacy of maternal preparation and safety of transitions to and from the hospital, including early discharge, have been reported in the professional literature although findings about the relationship of length of stay to mothers' and newborns' outcomes have been contradictory and inconsistent (Dow, Harris, & Liu, 2006; Brown, Small, Faber, Krastev, & Davis, 2009; Eaton, 2001; Grullon et al., 1997). Proponents of shorter lengths of stay believe early discharge enhances parent-infant interaction and bonding, family integration, breastfeeding outcomes, and decreases the risk for hospital-acquired infections subsequently reducing the costs of care (Danielsen et al., 2000). However, Britton et al. (1999) found similar parenting outcomes were not enhanced by early discharge and in the contrary, breastfeeding failure was one of the main issues in early discharge considering full-milk production; a comprehensive

assessment of breastfeeding technique and maternal confidence are unlikely to occur within 24 or 48 hours after birth. Opponents of early postpartum discharge further claim that shorter lengths of stay contribute to maternal inability to take care for self and infant and lack of readiness for discharge leads to dissatisfaction with the degree of support given to prepare for going home (Frank-Hanseen, Hanson, & Anderson, 1999).

Additional research suggests hospitals need to shift the focus from the length of stay to discharge readiness measures to ensure health, education, and social needs are being met (Fink, 2011).

Because the transition from hospital to home after childbirth is a period of critical adjustment in personal well-being of the mother and infant, psychosocial adjustment, and new family dynamics, health care professionals should also consider the full spectrum of factors shaping readiness for hospital discharge not only in the postpartum period but in the antepartum and intrapartum periods. The extent to which patients and their families feel prepared to transition to different levels of care is critical to improving quality and reducing costs requiring an understanding of their learning needs at all phases of care to provide targeted education (Buchala, 2000). Education and resources are needed to make informed decisions regarding care transitions and can enable mothers and families to navigate, coordinate, and manage their care appropriately and effectively. Other efforts focusing on defining processes for achieving improvements in care transitions to provide safe, quality care are underway but are limited in understanding maternal and infant factors that contribute to poor outcomes after hospitalization (Friedman, Heneghan, & Rosenthal, 2009). Empowering patients and families through discharge planning after

childbirth can promote a successful transition home and healthy outcomes for mothers and infants.

Readiness for Discharge and Teaching Recommendations

Despite inconsistencies in the research with length of stay and maternal and infant outcomes, mothers' self-reports of readiness to return home have been consistent.

Hospitals that have adopted policies facilitating joint decision-making regarding the time for discharge reveal lower early discharge rates and improved outcomes than hospitals that gave the discharge decision-making solely to physicians (Dow et al., 2006).

Bernstein et al. (2007) found mothers were likely to identify themselves as unready for discharge when compared to their obstetricians' and pediatricians' views regardless of length of stay. The national public health institute in the United States, the Centers for Disease Control and Prevention (CDC), participated in a surveillance project called Pregnancy Risk Assessment Monitoring System (PRAMS) which collected state-specific, population-based data on maternal attitudes and experiences before, during, and shortly after pregnancy. The study found mothers identified the need for education on infant care management and psychosocial support before discharge to promote feelings of readiness for discharge and maternal and infant outcomes (CDC, 2014). As a result, women's health professional organizations have proposed criteria to improve readiness for discharge including the assessment of maternal and infant physiological stability; knowledge, ability, and beliefs regarding self-care and infant care; support at home; and availability of obstetric and infant care following discharge (American Congress of Obstetricians and Gynecologists, Royal College of Obstetricians and Gynaecologists, 2007).

Because nurses are often the first health care provider to observe changes in the status of the mother and newborn, they play a central role in identifying potential problems mothers and infants may encounter in adapting to the home environment. Teaching is the primary mechanism used by nurses for preparing patients and families for discharge and the transition home. A review of 18 studies of postpartum education emphasized the importance of providing education based on patient- and family-specific learning needs engaging mothers in post-discharge self-management after birth (Bowman, 2005). Discharge teaching should be adapted to cover the diverse learning needs of patients and families to facilitate self-care and infant-care at home. The impact of discharge teaching in improving discharge readiness and maternal and infant outcomes has not taken into consideration transition factors that may influence a mother's ability to apply discharge information. The conceptual framework will address transition factors and patient characteristics which can further facilitate an increase in nurses' knowledge, attitudes, and practices related to discharge assessment and preparation.

Data Sources

Three data sources were used to inform this paper. The first source involved a systematic review of the literature to identify the many factors associated with mothers' readiness for discharge in the antepartum, intrapartum, and postpartum periods. The second source included a scoping review to further identify gaps in the systematic review using a specific framework. The third source was a consensus study to identify additional factors associated with readiness for hospital discharge and the influence of teaching on discharge outcomes among an interprofessional team. The three sources provided the foundation for the development and validation of a new *Adaptation to Transitions* conceptual framework to inform practice.

Systematic Review of Literature

The purpose of the systematic review was to identify factors contributing to readiness for hospital discharge in the antepartum, intrapartum, and postpartum periods.

Methods. The approaches used in the systematic review were informed by guidelines outlined in the Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) (Moher, Liberati, Tetzlaff, & Altman, 2009), the Cochrane Handbook for Systematic Reviews (Higgins & Green, 2011), and the framework for conducting scoping studies (Levac, Colquhoun, & O'Brien, 2010).

Databases and Search Terms. The comprehensive search strategy consisted of electronic searches of databases including Academic Search Premier, CINAHL Plus, MEDLINE, Ovid, PsycINFO, and PubMed from May-June 2014. Additional papers were included using the reference lists in the records meeting inclusion criteria. The terms used in the search and their combinations are illustrated in Table 1. Every combination of primary, secondary, and tertiary terms were used for the searches. Additionally, 'apply related words' was selected for each search and included broad categories such as patient discharge, length of stay, postnatal period, risk factors, maternal and infant welfare, and medical care, as well as specific groupings including breastfeeding, maternal anxiety, postpartum depression, maternal adjustment, and sociodemographic factors.

Inclusion Criteria and Selection of Articles. Full-text articles were included using the following inclusion criteria: published in the English-language; peer reviewed journals from 2004 to 2014; research conducted with mothers experiencing uncomplicated births defined by going home with their infant within four days after birth;

and included higher income countries given the differences in availability and accessibility of health services among higher and lower income countries (World Bank, 2014). Articles included in the review were not limited in study design but required original data analysis and needed to be relevant, even if the factors associated with readiness for hospital discharge were not the focus of the study.

The selection of articles is outlined in Figure 1. Once an article was excluded, it was not subject to review for additional sequential reasons which included: (1) non-English language publications (n=38); (2) outside of the 2004-2014 year range (n=537); (3) non-peer reviewed publications (189); (4) publication did not include original data (n=358); (5) reported on complicated births or on infants in the Neonatal Intensive Care Unit (n= 876); (6) low-income countries (n=89); and (7) publication did not address postpartum hospital discharge and related outcomes (n=972).

Scoping Review

Sixteen articles were included in the scoping review (in June 2014) to further identify gaps in the research and to summarize the findings. A scoping review helps inform a systematic review in exploring the extent of the literature in a particular area of interest and to assist in identifying appropriate parameters of the review (Levac et al., 2010). The framework for performing the scoping review included: clarifying the systematic review questions; research questions and purpose to guide the identification of pertinent studies; selecting studies based on inclusion and exclusion criteria with different reviewers and regularly discussing uncertainties; extracting data consistent with the research questions and purpose; analyzing, reporting, and considering the meanings of the findings; and consulting with stakeholders to discuss preliminary

findings and how to integrate the information in a conceptual framework through a consensus study.

Quality Assessment. Based on the results of the scoping review, seven articles met the overall quality of evidence using the Grading of Recommendations Assessment Development and Evaluation (GRADE) approach (Guyatt et al., 2011). As recommended by the Cochrane Handbook for Systematic Reviews of Interventions, the GRADE approach was used to evaluate each study based upon five factors which decrease the quality of evidence including limitations in the design and likelihood of bias, indirectness, inconsistency, imprecision of results, and publication bias, as well as three factors increasing the quality level of evidence, a large effect magnitude, plausible confounding biases demonstrating an effect, and the dose-response relationship (Table 2).

Consensus Study

In addition to the systematic literature review and the scoping review, a consensus study was conducted in July-October 2014 to agree on the factors associated with postpartum readiness for hospital discharge. A group of clinical and academic interprofessional health care team members examined the evidence of the reviews by participating in dual independent reviews at the full-text level and the scoping review level to identify factors to be included in the conceptual framework. At the full-text level, there was 96% acceptable agreement for inclusion of factors influencing readiness for hospital discharge and at the scoping review level, there was 91% agreement for inclusion of factors. Any inclusion discrepancies were discussed and resolved by using wider scientific evidence drawn from the expertise of the group and clinical practice. Additionally, perspectives related to discharge readiness factors and discharge teaching

were elicited from a convenience sample of postpartum patients and families in relation to the findings from the reviews.

During the consensus process, a number of patient attributes, health care provider practices, and hospitalization characteristics were extracted to examine their relationship with readiness for hospital discharge and the influence of teaching on discharge outcomes. Patient and family perspective themes were also examined for similarities using individual, provider, hospital, and other factors influencing readiness for discharge identified in the literature and consensus group. If the group was unclear of the findings, verification would occur with the patient and family member and/or one other expert in the field before finalizing the identified factors that would be used in the development of the conceptual framework.

Results

Analysis of the systematic literature review, scoping review, and consensus study identified five main themes in relation to factors associated with discharge readiness in the antepartum, intrapartum, and postpartum periods: (1) Maternal sociodemographic characteristics; (2) Prenatal characteristics; (3) Hospitalization factors; (4) Postpartum characteristics; and (5) Provider characteristics. Three main themes emerged regarding post-discharge outcomes related to these factors and include: (1) Healthcare utilization; (2) Maternal symptoms; and (3) Overall maternal health status.

The Antepartum Period

Maternal Sociodemographic Characteristics. Certain maternal sociodemographic characteristics preceding and existing in the antepartum period were found to have a statistically significant relationship in the literature and found to be

critical factors in the consensus study as they relate to hospital discharge. Maternal sociodemographic characteristics such as younger mothers, mothers with a known chronic illness, incomes below federal poverty level, minorities, and those with public or no insurance, were found to have a statistically significant association with hospital discharge (Bernstein et al., 2012; Bernstein et al., 2007). These characteristics were consistent with unreadiness for discharge in the consensus study. After controlling for maternal sociodemographic factors, factors of unreadiness that remained significant in predicting hospital readiness included age, race/ethnicity, having a known chronic disease, insurance, and parity (Bernstein et al., 2007; Weiss et al., 2009). Therefore, older multiparous mothers of the racial/ethnic majority, without a known chronic illness who have private insurance, have higher perceptions of hospital discharge readiness. Similarly, mothers of the ethnic majority, accepting a longer length of stay, who had a family physician, were the maternal sociodemographic characteristics that were significantly associated with readiness for hospital discharge in the antepartum period (Watt et al., 2005). In these studies, maternal education level was not associated with readiness of hospital discharge.

Prenatal Characteristics. Another significant factor associated with readiness for hospital discharge in the antepartum period were mothers who prepared themselves for birth by taking prenatal classes and those who did not experience prenatal complications (Bernstein et al., 2007). Pregnant women who had prenatal visits with a pediatric provider or who received adequate prenatal care were likely to be ready for discharge as noted in the literature and the feedback received from postpartum patients and families.

The Intrapartum Period

Hospital/Perinatal Factors. The hospital/perinatal factors in the intrapartum period found to significantly contribute to hospital discharge readiness included time of delivery and neonatal/maternal problems (Bernstein et al., 2012; Bernstein et al., 2007; Britton, 2005; Watt et al., 2005). According to the literature, consensus study, and postpartum patients, mothers who did not experience complicated deliveries including labor greater than 12 hours as defined by patients, prolonged labor as defined by obstetricians, delivery during non-routine hours (7:00 pm to 7:00 am), and other physical problems in the hospital, were more likely to be ready for hospital discharge. Mothers who did not have infants of lower birth weight, infants who had medical problems or signs of illness in the hospital, had significantly higher perceptions of discharge readiness (Bernstein et al., 2012; Bernstein et al., 2007; Watt et al., 2005). Mothers who had vaginal deliveries were more likely to be ready for hospital discharge compared to mothers who delivered with cesarean sections.

Provider Characteristics. Provider characteristics in the intrapartum period that were significantly correlated with readiness for hospital discharge included the practitioner's age and number of years practicing, the practitioner's parental status, the practitioner's certification, content needed and content received by providers, and educational topics covered in the hospital (Bernstein et al., 2012; Bernstein et al., 2007; Sword et al., 2005; Watt et al., 2005; Weiss et al., 2009). Self-reported characteristics of pediatric practitioners indicated mothers, who had board-certified practitioners with more experience who were parents, were associated with higher levels of hospital discharge readiness. The content mothers perceived as needed compared to the content they

received, their unmet learning needs, and the way in which information was presented, significantly contributed to the readiness for hospital discharge as identified in the literature review, consensus study, and by postpartum patients and families (Watt et al., 2005; Weiss et al., 2009). Mothers who received a modest amount of information (one to four topics) covered by providers in the hospital were more likely deemed ready for discharge (Bernstein et al., 2012; Bernstein et al., 2007).

The Postpartum Period

Postpartum Characteristics. The immediate postpartum characteristics associated with hospital readiness for discharge noted in the literature, the consensus study, and postpartum patient and family perspectives include feeding method and length of stay (Bernstein et al., 2012; Bernstein et al., 2007; Dennis et al., 2004; Sword et al., 2005; Weiss et al., 2009). From the literature review and patient perspectives, women who were breastfeeding compared to women who were bottle-feeding immediately in the postpartum period were more likely to have unmet learning needs. Mothers not intending to breastfeed and mothers' satisfaction with infant feeding were significantly associated with readiness for hospital discharge (Bernstein et al., 2007; Dennis et al., 2004). Longer lengths of stay in postpartum was associated with readiness for hospital discharge (Bernstein et al., 2007).

Discussion

Conceptual Framework

The findings from the systematic literature review, scoping review, and the consensus study including the perspectives from postpartum patients and families, led to the development of a conceptual framework to guide a research study exploring the antepartum, intrapartum, and postpartum factors influencing the relationship between readiness of hospital discharge and the post-discharge outcomes. This heuristic framework composed of conceptually-related variables derived from all sources provides the framework for identifying factors relevant to readiness for hospital discharge as mothers adapt to the transitions from antepartum, intrapartum, and postpartum to home. Figure 2 illustrates the *Adaptation to Transitions* conceptual framework.

Individuals and groups are regarded as adaptive systems whose behavior is a response to environmental stimuli that changes in transitioning from one life phase or condition to another (Meleis, Sawyer, Im, Messias, & Schumacher, 2000; Roy, 2009). According to the data sources used, discharge can be influenced by factors identified in the three phases of the transitional process (a) the antepartum period where environmental stimuli and the nature of transitions are represented by factors that account for differences in patient characteristics, personal, and environmental conditions; (b) the intrapartum period where the concept of coping processes and transition conditions are represented by birthing conditions that could facilitate or inhibit the transition process; (c) the postpartum period where adaptation modes and response patterns are examined by assessing patients' readiness for hospital discharge. The nursing intervention process is discharge teaching as it can be a predictor of discharge readiness in facilitating the

transition to home. A table of the major concepts represented in the three transition periods in the *Adaptation to Transitions* conceptual framework are summarized in Table 3.

The first major concept in the *Adaptation to Transitions* conceptual framework is present in the antepartum period which describes the nature of transition-types and patterns influenced by three types of stimuli-focal, contextual, and residual influencing a mother's ability to cope with the environment. The type of transition is the admission to the hospital and the pattern of transition includes the complexity of the admission. Here, the focal stimulus was identified in the literature as the immediate internal or external sociodemographic factor contributing to the mother's response such as parity or age. The contextual stimuli include all other factors identified in the literature and the consensus study, such as family support contributing directly to the responses. The residual stimulus symbolizes the mother's cultural beliefs or practices that may influence the mother's decisions in her care as identified by patient's perspectives.

The second major concept in the conceptual framework is described in the intrapartum period including the transition conditions. Transition conditions are circumstances influencing the way in which the mother moves through intrapartum to postpartum and is impacted by the coping processes that can facilitate or hinder progress towards achieving a healthy transition as identified in the literature and consensus study. Mothers use mechanisms to cope during the intrapartum period that can be referred to as the regulator, cognator, and stabilizer coping processes. The regulator coping process functions primarily through physiological channels processing stimuli during birth affected by the mode of delivery. The cognator coping process involves processing of

emotions and perceptual stimuli influencing affect. The stabilizer coping process represents cerebral responses for processing learning and judgment and focuses on the mother's coping ability during the intrapartum period.

The third major concept in the conceptual framework includes response patterns which are conceptualized and influenced by process and outcome adaption modes identified in the literature, consensus study, and patient perceptions. Responses to environmental stimuli are expressed in patient's behaviors in the postpartum period at discharge and post-discharge. The physiological mode of adaptation involves the mother's biological responses and focuses on the basic elements needed to function such as vital signs. The self-concept mode includes a mother's feelings about her body and personal status. The role function mode describes knowledge of the mothering role such as breastfeeding. The interdependence mode of adaptation emphasizes interpersonal relationships and giving and receiving of social support.

The fourth major concept in the *Adaptation to Transitions* conceptual framework includes nursing interventions or therapeutics involved in managing the transition to home as identified in the consensus study and patient's perceptions. The first measure that is applicable to a therapeutic nursing intervention is the assessment of readiness for discharge. The second measure includes education as the primary intervention for creating optimal conditions in the preparation for discharge. The third measure includes role supplementation conceptualized as a deliberate process in the delivery of information that assists mothers in acquiring the knowledge needed to care for their infants and for themselves.

Implications for Nursing

The *Adaptation to Transitions* conceptual framework provides a clear linkage between the antepartum, intrapartum, and postpartum factors that impact postpartum discharge readiness. Identification of the critical determinants of discharge readiness and assessment of characteristics nurses and other health care providers can observe during each transition of care, is imperative when implementing patient and family-specific education that can help facilitate their transition home. Additionally, the framework provides organizations the direction needed in the development, implementation, and evaluation of care guidelines for discharge readiness assisting patients with adapting to the antepartum, intrapartum, and postpartum transitions, preparing for hospital discharge, and facilitating optimal post-discharge outcomes.

The proposed conceptual framework can also be used in research. It provides a current account of existing evidence that can be used in the development of theory and in the identification of gaps in nurses' knowledge base with respect to the assessment and preparation of patients for hospital discharge. The conceptual framework can also guide future research and can build on evidence to clearly define the factors impacting patients' discharge readiness not only in the postpartum patient population but other populations as well. The conceptual framework can be used in the identification of variables of interest for studies, critique of future literature, and guide research methods and analysis.

Conclusion

The solution for improving health outcomes of postpartum mothers and their infants involves a comprehensive identification of readiness factors at all phases of pregnancy and birth trajectory to ensure that the necessary support and services are received to provide safe and effective care transitions. Health care providers can utilize

the *Adaptation to Transitions* conceptual framework to identify mothers at risk for discharge unreadiness in the antepartum, intrapartum, and postpartum periods to implement specific interventions for maternal support along the continuum of care. However, individualized definitions of readiness from patients and families should be taken into consideration to enhance the provision of services mitigating the impact on health care outcomes and facilitating the identification of non-predetermined situations affecting readiness along with strategies for addressing them. Anticipatory interventions could effectively promote an easier transition in each phase and decrease the related adverse post-discharge outcomes. As a fundamental aspect of nurses' practice, teaching should be incorporated during each phase to provide multiple opportunities for reinforcing discharge readiness content particularly to those mother exhibiting at-risk characteristics. This can foster self-confidence in the mother's readiness to take care of herself, the infant, and the family post-discharge. Assessment of the maternal vulnerabilities paired with individualized patient care and education should not only be incorporated into daily practice but also in clinical guidelines and policies with local providers, hospitals, insurers, patients/families, and social agencies to improve the overall health and wellness of childbearing women.

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Tables and Figures

Table 1

Search Terms

Primary Terms	Secondary Terms	Tertiary Terms
‘antepartum’ ‘intrapartum’ ‘postpartum’ AND ‘hospital discharge’	‘readiness’ ‘information’ ‘teaching’ ‘concerns’	‘health outcomes’ ‘anxiety’ ‘depression’ ‘service utilization’ ‘follow-up care’

Figure 1. Flow Diagram of Review

Table 2

GRADE Quality of Evidence Definitions

Factors decreasing and increasing the quality of evidence	
Limitations in design	The design and implementation of available studies includes risk of biases such as selection bias, measurement bias and failure to control confounding factors.
Indirectness	The available evidence is different from the question addressed in the systematic review and includes populations, interventions, controls, and outcomes that do not address the question.
Inconsistency	Findings and associations across the studies are inconsistent with results including problems with subgroup analysis suggesting differences in cause-effect relationships.
Imprecision of results	Few participants in the study resulting in wide confidence intervals surrounding the effect.
Publication bias	Over- or under-reporting of an effect due to the selective publications of study.
Factors increasing the quality of evidence	
Large effect magnitude	The larger the effect, the stronger the evidence resulting from a methodologically-strong study.
Plausible confounding biases	Confounding biases reduce a demonstrated effect; the exposure effect may be larger than the data suggests.
Exposure-response relationship	Situations when all reasonable biases would decrease the magnitude of the effect.

Figure 2. The Adaptation to Transitions Conceptual Framework

Table 3

Major Concepts in the Adaptation to Transitions Conceptual Framework

Antepartum	Intrapartum	Postpartum (discharge and post-discharge)
<u>Nature of Transition:</u> Type- Admission to hospital Pattern- Complexity of admission <u>Environmental Stimuli:</u> Focal- Patient characteristics Contextual- Family support Residual- Cultural beliefs/ethnicity	<u>Transition Conditions:</u> Hospitalization factors <u>Coping Processes:</u> Regulator- Physical responses depending on mode of delivery Cognator- Emotional responses and affect during birth Stabilizer- Cerebral responses, learning and coping ability	<u>Response Patterns:</u> Process and outcome adaptation modes <u>Adaptation Modes:</u> Physiological- Vital signs, laboratory values Self-concept- Personal status, feelings Role function- Knowledge of mothering role Interdependence- Interpersonal relationships; social support

Manuscript #3

Antepartum, Intrapartum, and Postpartum Factors Associated with the Readiness for
Hospital Discharge

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Abstract

Background: According to the World Health Organization, preparation for hospital discharge after birth became a global concern when hospitals in many developing countries began implementing shorter lengths of stay for uncomplicated deliveries. Although a mother's perceived readiness for hospital discharge may be influenced by many factors, research suggests the quality of discharge teaching may be a predictor of readiness for hospital discharge. Additional research is needed to identify the predictors of readiness for hospital discharge. Therefore, the purpose of this study was to explore the antepartum, intrapartum, and postpartum predictors of readiness for hospital discharge.

Methods: A purposive sample of postpartum mothers who experienced a vaginal or cesarean birth of a healthy infant ($N = 185$) completed demographic, quality of discharge teaching, and readiness for hospital discharge questionnaires prior to discharge.

Results: A final model was computed with all significant predictors for readiness for hospital discharge. Infant length of stay, the delivery of education, and the difference between educational content received and the educational content needed, were the significant predictor variables accounting for 42% of the variance in readiness for hospital discharge ($R^2 = 0.44$, $R^2_{adj} = 0.42$, $F(8,176) = 17.5$, $p < 0.001$).

Conclusion: The relationship between quality of discharge teaching and the readiness for discharge provides evidence of nurses' critical role in educating patients in caring for themselves and their baby. Patient perceptions of discharge readiness may be both a process measure, to identify patients in need of additional interventions before discharge, and a nurse-sensitive outcome measure of the postpartum hospitalization experience.

Introduction

According to the World Health Organization (2009), preparation for hospital discharge after birth became a global concern when hospitals in many developing countries began implementing shorter lengths of stay for uncomplicated deliveries. In the United States, the passage of the Newborns' and Mothers' Health Protection Act in 1996, shortened the length of hospital stay to lengths previously considered to be "early discharge" (Eaton 2001; General Accounting Office 1996; Secretary's Advisory Committee on Infant Mortality, 2001). Although the purpose of the legislation was to protect mothers and infants, improve maternal and newborn outcomes, and reduce hospital readmissions, provisions to identify mothers who were ready for hospital discharge were not addressed.

Shorter lengths of stay have been associated with lower perceived readiness for discharge suggesting mothers' perceptions of readiness may not be taken into account in discharge timing decisions (Weiss et al., 2006). Hospital discharge from postpartum before a mother is physically and/or psychologically ready, places the mother and infant at a greater risk of detrimental maternal and infant health outcomes, increase use of health services, and the adoption of poor behaviors during the postpartum period (Bernstein et al., 2002; Margolis, Kotelchuck, & Chang, 1997). Few studies have analyzed the factors influencing mothers' readiness for hospital discharge; notably, the majority of these studies have examined factors associated with readiness for hospital discharge in the postpartum period and do not take into consideration factors in the antepartum and intrapartum periods influencing readiness for discharge (Beger & Cook, 1998; Bowman, 2005; Buchala, 2000; Malkin, Garber, Broder, & Keeler, 2000; Madden

et al., 2004; Weiss, Ryan, Lokken, 2006; Weiss, Ryan, Lokken, & Nelson, 2004). As postpartum length of stay has decreased, the need to identify the factors influencing readiness for hospital discharge, has become increasingly important to the patient's physical, psychological, and social well-being. Postpartum mothers who are not ready for discharge may experience poor health outcomes and an increase in healthcare utilization (Bernstein, Spino, Lalama, Finch, Wasserman, & McCormick, 2012). Healthcare professionals should consider the full spectrum of factors shaping readiness for hospital discharge not only in the postpartum period but in the antepartum and intrapartum periods. The solution for improving health outcomes of these mothers and infants is the comprehensive identification of readiness factors at all phases of their pregnancy and birth trajectory to ensure they receive the necessary support and services to provide a safe and smooth transition along the continuum of their care.

Readiness for Discharge and Teaching Recommendations

Teaching to promote mothers' readiness for discharge also warrants a closer investigation as it can influence the care transition from one level of care to the next (Institute of Medicine [IOM], 2001). Moreover, the impact of teaching on readiness for hospital discharge has not been well understood and studies have focused on self-selected, special populations whose findings may not be generalizable to the broader childbearing population (Britton et al., 2002; Brumfield et al., 1996; Gazmarian et al., 1997; Grullon & Grimes, 1997; Fishbein & Burggraf, 1998; Lieu et al., 2000).

Mothers' self-reports of needing education to facilitate the transition home have been consistent. The Centers for Disease Control and Prevention (CDC), participated in a surveillance project called Pregnancy Risk Assessment Monitoring System (PRAMS)

which collected state-specific, population-based data on maternal attitudes and experiences before, during, and shortly after pregnancy. The study found mothers identified the need for education on infant care management and psychosocial support before discharge to promote feelings of readiness for discharge and maternal and infant outcomes (CDC, 2014). Accordingly, women's health professional organizations have proposed criteria to improve readiness for discharge including the assessment of maternal and infant physiological stability; knowledge, ability, and beliefs regarding self-care and infant care; support at home; and availability of obstetric and infant care following discharge (Royal College of Obstetricians and Gynaecologists, 2013).

Because nurses are often the first health care provider to observe changes in the status of the mother and newborn, they play a central role in identifying potential problems mothers and infants may encounter in adapting to the home environment. Teaching is the primary mechanism used by nurses for preparing patients and families for discharge and the transition home. A review of 18 studies of postpartum education emphasized the importance of providing education based on patient- and family-specific learning needs engaging mothers in post-discharge self-management after birth (Bowman, 2005). Discharge teaching should be adapted to cover the diverse learning needs of patients and families to facilitate self-care and infant-care at home. The impact of discharge instruction on readiness for hospital discharge requires further investigation to explore the characteristics of teaching that strongly influence readiness. This can enhance nurses' knowledge, attitudes, and practices related to discharge education and evaluation. The purpose of this study was to explore the antepartum, intrapartum, and

postpartum factors including nursing educational practices that are predictive of postpartum mothers' perceptions of readiness for hospital discharge.

Methods

The study is part of a two-study series investigating the relationships between antepartum, intrapartum, and postpartum predictors of readiness for hospital discharge and the post-discharge outcomes. The investigation reported here is a descriptive correlational design study with an analyses of predictive variables informed by the Adaptation to Transition conceptual framework and the review of the literature of five major constructs: antepartum, intrapartum, and postpartum characteristics; quality of discharge teaching; and the readiness of discharge (Figure1). Purposive sampling of postpartum women experiencing uncomplicated birth events were recruited during their postpartum hospital stay if they meet the following study inclusion criteria: (1) at least 18 years of age, (2) uneventful post-birth experience as evidenced by discharge home with the infant, (3) mothers with infants who are not transferred to the Neonatal Intensive Care Unit (NICU). A sample size of 174 postpartum mothers was estimated for a two-tailed test $\alpha = .05$, to achieve a power of at least 80% in multiple regression analyses with up to 11 predictor variables at a moderate effect size (Polit & Beck, 2012). One-hundred and eight five postpartum mothers who met the study inclusion criteria participated in the study conducted in a 72-bed postpartum unit with mother-baby couplet care in a non-profit women's specialty hospital located in Western United States.

Variables and Instruments

Two scales that were previously developed and tested in the postpartum patient population were used (Weiss & Piacentine, 2006). The Readiness for Discharge Scale

(RHDS)-New Mother Forms was used to measure the mothers' perceptions of readiness for hospital discharge and the Quality of Discharge Teaching Scale (QDTS) was used to measure educational preparation for discharge. Data was collected on patient demographics using a demographic questionnaire.

Demographic Questionnaire. An 11-item demographic questionnaire using concepts derived from the Adaptation to Transition conceptual framework and the review of the literature included: (1) antepartum factors i.e. nature of transition: previous admission for a birth, infant's gestational age, and environmental stimuli: age, race/ethnic group, living with father of the baby, highest level of education, employment status; (2) intrapartum factors i.e. hospitalization factors: mode of delivery, maternal and infant length of stay; (3) postpartum factors i.e. feeding method.

Readiness for Hospital Discharge Scale-New Mother Form. The RHDS-New Mother Forms is a 23-item instrument including 21 items from a master version of the RHDS developed for patients' assessments of discharge readiness from acute care facilities. The items on the readiness scale include content worded specifically for the postpartum mother patient population. Twenty-two items form four subscales including personal status, knowledge, coping ability, and expected support and one single dichotomous item inquiring about whether or not the mother is ready to be discharged. These items were congruent with the conceptual framework components, in particular the intrapartum period, i.e. coping process, and the postpartum period, i.e. patterns of response and modes of adaptation. An additional open-ended question was included in the instrument requesting additional thoughts regarding the mothers' readiness for hospital discharge. The RHDS-New Mother Form is a self-reported summated 11-point

rating scale (0-10) with anchor words such as, “not at all,” “extremely well,” to cue the participant into the meaning of the numeric scale. Higher scores on the scale indicated greater readiness for discharge. The reading level of the instrument is a grade level of 7.3 (Microsoft Word 2003, Flesch-Kincaid Grade Level Score). Construct validity using confirmatory factor analysis and contrasted group comparisons, and predictive validity were supported for the 22-item scale (Weiss et al., 2006). The Cronbach's α reliability coefficients was 0.93 and established the internal consistency of items.

Quality of Discharge Teaching Scale. The QDTS instrument consisted of 19 items and used a similar scaling format to the RHDS with higher scores indicating a greater quality of discharge teaching. An exploratory factor analysis of the QDTS identified a two-factor structure (content and delivery) accounting for 54.2% of scale variance (Weiss et al., 2006). The instrument consisted of three subscales. The content subscale consisted of seven paired items representing the amount of “content needed” and “content received” during teaching preparation for discharge and corresponds to the coping processes and modes of adaptation concepts in the conceptual framework. The 12-item “delivery” subscale represents the skill of the nurses as educators in providing discharge teaching correlating with the nursing therapeutics/intervention component of the conceptual framework. An additional open-ended question was included in the instrument requesting additional thoughts regarding the quality of discharge teaching. The Cronbach's α reliability coefficients was 0.85 demonstrating internal consistency of items.

Data Procedures

Approval was obtained from university and hospital institutional review boards. During postpartum hospitalization, postpartum participants who met inclusion criteria were recruited 24 hours prior to discharge from the postpartum unit. An introductory letter explaining the study, request for participation, and a statement informing the mother that completion of the data indicated her willingness to participate was included with the demographic, the RHDS-New Mother Form, and the QDTS.

Data Analysis

Quantitative data was entered and analyzed using IBM® Statistical Package for the Social Sciences (SPSS)® V21.0. Non-parametric descriptive statistics including frequency counts and percentages for categorical variables and means and standard deviations for continuous variables to describe the sample and study variables. Parametric inferential statistics was used to examine the relationships among study variables. The predictors of postpartum mothers' perceptions of readiness for hospital discharge was examined using simultaneous multiple linear regression. The predictor variables were entered simultaneously and grouped according to the antepartum, intrapartum, and postpartum concepts in the Adaption to Transitions conceptual framework.

Results

Study Sample Characteristics

The sociodemographic characteristics of study participants are presented in Table 1. Participants' mean age was 30.8 and ranged from 16-49. The majority of participants (41.6%) were Caucasian, married and living with the father of the infant (74.6%), had a

bachelor's degree (31.4%), planning on returning to work full-time after three months (43.8%), with an average of two children living at home ranging from one to five children. Most participants (61.6%) delivered vaginally, had an average length of stay of 2.9 days ranging from one to seven days, and were breastfeeding upon discharge (70.8%). Participants' infants' gestational mean age was 38.9 weeks and ranged from 34-42 weeks and their infant's length of stay on average was 2.7 days and ranged from one to seven days.

Overall, 98% of participants reported being ready to go home on a single item dichotomous (yes/no) question on the Readiness for Hospital Discharge Scale (RHDS). Descriptive statistics for the RHDS and the Quality of Discharge Teaching Scale (QDTS), are presented in Table 2. On average, the participants in the study sample reported receiving adequate quality discharge teaching and were reasonably ready for discharge. The positive content difference score indicates that in general, participants perceived that they received more educational content than their stated need. Only 14 participants (7.6%) reported receiving less educational content than their perceived need. The delivery of education mean score was the highest among the three different categories illustrating more favorable responses with how the education was delivered.

Predictors of Readiness for Hospital Discharge

Initially, a series of bivariate models were developed that included each individual independent variable for the RHDS based on the conceptual framework. The results in Table 3 illustrate the antepartum, intrapartum, postpartum, and nursing intervention categorical and continuous variables demonstrating an independent association with the RHDS. In order to examine potential interactions among variables, a liberal cutoff of $p <$

0.10 was used for inclusion in the multivariate regression model. The antepartum characteristics associated with the RHDS were employment and number of children. Differences in RHDS mean scores were not significantly different among study participants returning part-time to work ($M= 7.34$) and those returning full-time to work ($M= 7.77$) or those who identified themselves in the “other” category i.e. per diem work ($M= 7.68$). However, RHDS means scores were lower among study participants returning part-time to work ($M= 7.34$) than participants who were not employed ($M= 7.96, p= 0.07$) indicating that these participants were not as prepared for discharge compared to those who were not employed (Table 3, Model 1a). The number of children provided a statistically significant ($p= 0.02$) linear explanation of the variation in RHDS (Table 3, Model 1b).

The ten predictors were entered simultaneously to create a final multivariate model. The intrapartum characteristic associated with the RHDS was the delivery mode. The F statistic ($F= 4.337$) indicates that the model does provide a statistically significant ($p= 0.04$) linear explanation of the variation in RHDS where the delivery mode contributed to the explained variance in RHDS (Table 3, Model 2).

The postpartum characteristics associated with the RHDS were feeding method, and maternal and infant length of stay. Differences in RHDS mean scores were higher among participants who were bottle-feeding ($M= 8.5$) than breastfeeding only ($M= 7.7, p= 0.06$) and both breastfeeding and bottle-feeding ($M= 7.6, p= 0.04$) indicating that these participants were not as prepared for discharge compared to those that were only bottle-feeding their infants (Table 3, Model 3a). The F statistic ($F= 8.23$) indicates that the model does provide a statistically significant ($p= 0.01$) linear explanation of the

variation in RHDS where maternal length of stay contributed to the explained variance in RHDS (Table 3, Model 3b). The F statistic for infant length of stay ($F= 10.2$) also indicates that the model does provide a statistically significant ($p= 0.002$) linear explanation of the variance in RHDS (Table 3, Model 3c).

The final set of independent variables to be analyzed were the nursing therapeutics/ interventions i.e. Quality of Discharge Teaching (QDT). The nursing therapeutics/interventions associated with the RHDS were entered independently into the regression equation. The F statistic ($F= 62.9$) indicates that the total QDTS does provide a statistically significant ($p< 0.001$) linear explanation of the variation in RHDS (Table 3, Model 4a). The QDTS total scale score was a statistically significant predictor accounting for 26% ($R^2= 0.26$) of the variance in RHDS. Upon further exploration of variable(s) that independently contributed to the explained variance in RHDS, it was found that the content received subscale was a statistically significant predictor accounting for 9% ($R^2= 0.09$) of the variance in RHDS (Table 3, Model 4b). The delivery subscale was found to be a statistically significant predictor as well accounting for 33% ($R^2=0.33$) of the variance in RHDS (Table 3, Model 4b). Finally, the content difference subscale accounted for 13% ($R^2=0.13$) of the variance in the RHDS (Table 3, Model 4c).

The ten predictors were entered simultaneously to create a final multivariate model. Results of multiple regression analysis of the RHDS are presented in Table 4. Based on the results, F statistic ($F= 14.52$) indicates that the overall model provided a statistically significant ($p< 0.001$) linear explanation of the variation in RHDS accounting for 46% ($R^2= 0.46$) of the variance in RHDS at the $p< 0.05$ level. When further exploring which variable(s) contributed to the explained variance in RHDS, it was found

that the number of children the study participant had, the infant's length of stay, the content delivery subscale and the content difference subscale of the QDTS contributed to the explained variance.

Discussion

Patients' perceptions of readiness for hospital discharge after birth involves a complex synergy of factors in the antepartum, intrapartum, and postpartum periods including sociodemographic characteristics, health status, hospitalization factors, role behavior, coping ability, expected support, knowledge of self-care and care of their infant. As anticipated, the majority of mothers reported being ready for discharge, where certain factors significantly contributed to the readiness of hospital discharge. In the antepartum period, preexisting maternal sociodemographic characteristics such as number of children was associated with readiness for hospital discharge where mothers who had three or more children were oftentimes more prepared for discharge than mothers with less than three children possibly because of their prior birth experiences. This supports prior studies of postpartum mothers with certain maternal sociodemographic characteristics such as younger, primiparous mothers of low socioeconomic status, without prenatal preparation requiring a closer evaluation for discharge readiness (Friedman, Heneghan, & Rosenthal, 2009; Kurtz Landy, Sword, & Valaitis, 2009; Lichtenstein et al., 2004). In the intrapartum period, delivery mode was the factor associated with readiness for hospital discharge where mothers who had delivered vaginally scored higher on the RHDS suggesting a higher degree of readiness for discharge than those mothers who had a cesarean section. This finding is consistent with other studies given the complications that can arise after surgery (Britton, 2005;

Watt et al., 2005). In the postpartum period, bottle-feeding was the significant factor contributing to the readiness for hospital discharge suggesting that mothers who were both bottle-feeding and breastfeeding or breastfeeding only had lower degrees of readiness for discharge. This supports previous findings of women who were breastfeeding compared to women who were bottle-feeding immediately in the postpartum period were more likely to have unmet learning needs and feel unprepared to go home (Sword et al., 2005).

The study demonstrated that the factors that had most influence on readiness for hospital discharge readiness were related to the nursing educational practices. Study participants reported on the amount and quality of discharge teaching characterized as the aggregate of all discharge-related teaching. The participants reported average quality discharge teaching, received in amounts that were below their perceived needs; the amount and manner in which nurses delivered the educational content were independently predictive of mothers' perceptions of their readiness to go home. The greater the gap between the need and received educational content and the greater the nurse's skill and ability in delivering the information, the increased likelihood that the mother perceived herself as ready for discharge. This suggests that patients would benefit from an assessment of their educational needs to individualize their education and identify the most favorable manner of delivering the content that would facilitate retention of the information. Nonetheless, mothers may not be able to identify the breadth of their learning needs during the exhausting stages of recovery but should be balanced by the frequency and skilled delivery of education, a therapeutic intervention that has benefits in facilitating discharge readiness. Future exploration of the quality of discharge

teaching once the patient is home and the relative contribution of the RHDS on the post-discharge outcomes is warranted.

Limitations

The data sources for this investigation are based on postpartum participants' perceptions regarding the discharge transition including perceptions of their readiness for discharge and the discharge teaching. These reports of perceptions reflect the mother's reality but may not represent the reality of the clinical environment or the actual teaching.

Data for this investigation was collected from participants who experience an uncomplicated birth in a single hospital and therefore may not reflect the experiences of mothers in other health care facilities, birthing centers, locations, or those that may experience complications during birth and/or during postpartum. Similarly, nurses who practice in other settings and locations may encounter different discharge processes, different nursing ratios, and/or take care of patients with different demographics limiting the generalizability of results.

Conclusions

The solution for improving health outcomes of postpartum mothers and their infants involves a comprehensive identification of readiness factors at all phases of pregnancy and the birth trajectory to ensure that the necessary support and services are received to provide safe and effective care transitions. The results provide critical evidence of the antepartum, intrapartum, and postpartum characteristics to take into consideration when preparing patients for discharge and the importance of quality discharge teaching in promoting readiness for discharge and the transition to home. Nonetheless, individualized definitions of readiness from patients and families should be

taken into consideration to enhance the provision of services affecting readiness for discharge along with strategies for addressing them. Anticipatory interventions could effectively promote an easier transition in each phase and decrease the potential of related adverse post-discharge outcomes. As a fundamental aspect of nurses' practice, teaching should be incorporated during each phase to provide multiple opportunities for reinforcing discharge readiness content particularly to those mother exhibiting at-risk characteristics. This can foster self-confidence in the mother's readiness to take care of herself, the infant, and the family post-discharge. Assessment of the maternal vulnerabilities paired with individualized patient care and education should not only be incorporated into daily practice but also in clinical guidelines and policies with local providers, hospitals, insurers, patients/families, and social agencies to improve the overall health and wellness of childbearing women.

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Tables

Table 1: Sociodemographic Characteristics of Study Participants (n=185)

Sociodemographic Characteristics	Mean	SD	Median
Age in years	30.8	5.3	31
Number of children	1.6	0.8	1
Maternal length of stay in days	2.9	1.2	3
Gestational age in weeks	38.9	1.4	39
Infant length of stay in days	2.7	1.1	2
Race/Ethnic group	No.	%	
Latino	41	22.2	
Black (not Latino)	5	2.7	
White (not Latino)	77	41.6	
Asian/Pacific Islander	27	14.6	
Mexicana	19	10.3	
Multi-Ethnic	8	4.3	
Other	8	4.3	
Living with father			
Yes-Married	138	74.6	
Yes-Single	31	16.8	
No	16	8.6	
Education			
Less than high school	11	5.9	
High school	31	16.8	
Partial college (> 1 year)	50	27.0	
Bachelor's degree	58	31.4	
Master's degree	27	14.6	

Table 3: Summary of Bivariate Analysis

Predictor Variables	Model Statistics	Post-Hoc Test-Tukey HSD				
		Work Status (I)	Work Status (J)	Mean Difference (I-J)	SE	P
Model 1: Antepartum characteristics						
(a) Employment	F(3,181)=2.36 P=0.073	Part-time	Full-time	-0.43	0.20	0.16
			Not Employed	-0.62	0.25	0.07
			Other	-0.34	1.30	0.66
(b) Number of Children	F(1,183)=5.38 P=0.02 R ² =0.03 Adjusted R ² =0.02	B	Variable Statistic SE B	Standardized β	t	P
		0.23	0.1	0.17	2.32	0.02
Model 2: Intrapartum characteristics	F(1,183)=4.33 P=0.04 R ² =0.02 Adjusted R ² =0.02	B	SE B	Standardized β	t	P
(a) Delivery Mode		-0.36	0.17	-0.15	-2.08	0.04
Model 3: Postpartum characteristics		Post-Hoc Test-LSD				
		Feeding Method (I)	Feeding Method (J)	Mean Difference (I-J)	SE	P
(a) Feeding Method	Welch's F(2, 27)=15.1 P<0.001	Bottle-Feeding	Breastfeeding	0.84	0.44	0.06
			Breastfeeding & Bottle-Feeding	0.96	0.46	0.04
(b) Maternal LOS	F(1,183)=8.23 P=0.01 R ² =0.21 Adjusted R ² =0.04	B	SE B	Standardized β	t	P
		-0.21	0.07	-0.21	-2.87	0.01
(c) Infant LOS	F(1,183)=10.2 P=0.002 R ² =0.23 Adjusted R ² =0.05	-0.24	0.07	-0.23	-3.20	0.002
Model 4a: Nursing Interventions	F(1,183)=62.9 P=<0.001 R ² =0.26 Adjusted R ² =0.26	B	SE B	Standardized β	t	P
(a) Total QDTS (content received and delivery subscales)		0.44	0.06	0.51	7.93	<0.001
Model 4b: Nursing Interventions	F(1,183)=18.2 P=<0.001 R ² =0.30 Adjusted R ² =0.09	0.19	0.04	0.30	4.27	<0.001
(a) Content received subscale		0.50	0.05	0.57	9.39	<0.001
(b) Delivery subscale	F(1,183)=88.1 P=<0.001 R ² =0.57 Adjusted R ² =0.33					

Model 4c: Nursing Interventions	F(1,183)=43.7 P=<0.001	0.29	0.04	0.44	6.60	<0.001
(c) Content difference subscale	R ² =0.44 Adjusted R ² =0.13					

Table 4: Predictors of Readiness for Hospital Discharge Scale

Predictor Variables	Model Statistics	Variable Statistics				
		B	SE B	Standardized β	t	P
Model 1: Antepartum characteristics	F(10,174)=14.52 P=<0.001					
(a) Three children or more	R ² =0.46 Adjusted R ² =0.42	0.16	0.08	0.12	1.98	0.05
Model 2: Postpartum characteristics						
(a) Infant LOS		-0.37	0.19	-0.36	-1.96	0.05
Model 3: Nursing Interventions						
(a) Delivery subscale		0.43	0.06	0.48	6.63	<0.001
(b) Content difference subscale		0.15	0.04	0.23	3.58	<0.001

CHAPTER 5

Background and Study Purpose

Shorter lengths of stay have been associated with lower perceived readiness for discharge suggesting mothers' perceptions of readiness may not be taken into account in discharge timing decisions (Weiss et al., 2004). Hospital discharge from postpartum before a mother is physically and/or psychologically ready, places the mother and infant at a greater risk of detrimental maternal and infant health outcomes, increase use of health services, and the adoption of poor behaviors during the postpartum period (Bernstein et al., 2002; Margolis, Kotelchuck, & Chang, 1997). Few studies have analyzed the factors influencing mothers' readiness for hospital discharge; notably, the majority of these studies have examined factors associated with readiness for hospital discharge in the postpartum period and do not take into consideration factors in the antepartum and intrapartum periods influencing readiness for discharge (Beger & Cook, 1998; Bowman, 2005; Buchala, 2000; Malkin, Garber, Broder, & Keeler, 2000; Madden et al., 2004; Weiss, Ryan, Lokken, 2006; Weiss, Ryan, Lokken, & Nelson, 2004). As postpartum lengths of stay have decreased, the need to identify the factors influencing readiness for hospital discharge, including nurse interventions that facilitate mothers'

readiness for discharge, has become increasingly important to the patient's physical, psychological, and social well-being.

Teaching is the primary mechanism used by nurses for preparing patients and families for discharge and the transition home. Discharge teaching should be adapted to cover the diverse learning needs of patients and families to facilitate self-care and infant-care at home. The impact of discharge instruction on readiness for hospital discharge requires further investigation to explore the characteristics of teaching that strongly influence readiness. Additionally, the impact of readiness for hospital discharge on post-discharge outcomes has not been well understood and studies have focused on self-selected, special populations whose findings may not be generalizable to the broader childbearing population (Britton et al., 2002; Brumfield et al., 1996; Gazmarian et al., 1997; Grullon & Grimes, 1997; Lieu et al., 2000). Therefore the purpose of this investigation was to explore the antepartum, intrapartum, and postpartum factors associated with readiness for hospital discharge, particularly the role of discharge teaching to prepare mothers for discharge, the differences in nurses' and mothers' perceptions of readiness for discharge, and the subsequent outcomes after hospitalization.

Results and Analysis

Sociodemographic Characteristics

The sociodemographic characteristics of study participants are presented in Table 1. The participants' mean age was 30.8 and ranged from 18-49. The majority of participants (41.6%) were Caucasian, married and living with the father of the infant (74.6%), had a bachelor's degree (31.4%), planning on returning to work full-time after three months (43.8%), with an average of two children living at home ranging from one

to five children. Most participants (61.6%) delivered vaginally, had an average length of stay of 2.9 days ranging from one to seven days, and were breastfeeding upon discharge (70.8%). Participants' infants' gestational mean age was 38.9 weeks and ranged from 34-42 weeks and their infant's length of stay on average was 2.7 days and ranged from one to seven days.

Table 1: Sociodemographic Characteristics of Study Participants (n=185)

Sociodemographic Characteristics	Mean	SD	Median
Age in years	30.8	5.3	31
Number of children	1.6	0.8	1
Maternal length of stay in days	2.9	1.2	3
Gestational age in weeks	38.9	1.4	39
Infant length of stay in days	2.7	1.1	2
Race/Ethnic group	No.	%	
Latino	41	22.2	
Black (not Latino)	5	2.7	
White (not Latino)	77	41.6	
Asian/Pacific Islander	27	14.6	
Mexicana	19	10.3	
Multi-Ethnic	8	4.3	
Other	8	4.3	
Living with father			
Yes-Married	138	74.6	
Yes-Single	31	16.8	
No	16	8.6	

Sociodemographic Characteristics	Mean	SD	Median
Education			
Less than high school	11	5.9	
High school	31	16.8	
Partial college (> 1 year)	50	27.0	
Bachelor's degree	58	31.4	
Master's degree	27	14.6	
Doctoral degree	7	3.8	
Other	1	0.5	
Work status			
Full-time	81	43.8	
Part-time	51	27.6	
Not employed	33	17.8	
Other	20	10.8	
Delivery mode			
Vaginal	114	61.6	
Cesarean section	71	38.4	
Feeding			
Breastfeeding	131	70.8	
Bottle-feeding	7	3.8	
Both	47	25.4	

Outcome and Predictor Variables

Overall, 98% of participants reported being ready to go home on a single item dichotomous (yes/no) question on the RHDS. Descriptive statistics for the RHDS, RHDS-RN, QDTS, and PDCDS all which use a rating scale (0-10) is presented in Table

2. On average, the participants in the study sample reported receiving above average quality discharge teaching and were ready for discharge. The positive content difference score indicates that in general, participants perceived that they received more educational content than their stated need. The delivery of education mean score was the highest among the three different categories (content received, content difference, and delivery) indicating higher levels of quality discharge teaching related to the way in which the education was delivered. The RHDS-RN mean scores were higher than that of the patients' RHDS mean scores and the participants reported average levels of coping difficulty post discharge. Utilization of healthcare services was prevalent four weeks after discharge with 39 participants contacting their healthcare providers (58.2%) outside of their regularly scheduled appointments and eight participants contacting the hospital (11.9%). Nineteen participants made unplanned office/clinic visits (28.4%) and four made visits to urgent care/emergency room (6.0%).

Table 2: Summary of Predictor and Outcome Measures

Measures	N	Item Mean (SD)	Range
QDTS	185	7.7 (1.3)	3.4-9.8
Content Received	185	7.0 (1.8)	1.4-10.0
Content Difference (Received - Needed)	185	1.5 (1.7)	-2.7-5.9
Delivery	185	8.1 (1.3)	3.3-10.0
RHDS	185	7.7 (1.1)	3.6-9.6
RHDS-RN	59	8.63 (0.7)	6.8-9.7
PDCDS	67	4.8 (1.3)	1.8-8.2
Post-Discharge Utilization of Support and Services		No.	%
Calls to healthcare providers	67	39	58.2
Calls to hospital	67	8	11.9
Office/clinic visits	67	19	28.4
Urgent care/emergency room visits	67	4	6.0

Research Question 1: Predictors of Readiness for Hospital Discharge

The ten predictors were entered simultaneously to create a final multivariate model. Results of multiple regression analysis of the RHDS are presented in Table 3. Based on the results, the F statistic ($F=14.52$) indicates that the overall model provided a statistically significant ($p < 0.001$) linear explanation of the variation in RHDS accounting for 46% (adjusted $R^2 = 0.46$) of the variance in RHDS at the $p < 0.05$ level. When further exploring which variable(s) contributed to the explained variance in RHDS, it was found that the number of children the study participant had, the infant's length of stay, the content delivery subscale and the content difference subscale of the QDTS contributed to the explained variance. In a subsequent exploration, the content difference subscale and the delivery subscale together explained 40% (adjusted $R^2=0.40$) of the variance in RHDS for this study sample (Table 3, Model 1c and d).

Table 3: Predictors of Readiness for Hospital Discharge Scale

Predictor Variables	Model Statistics	Variable Statistics				
		B	SE B	Standardized β	t	P
Model 1: Antepartum characteristics	$F(10,174)=14.52$ $P<0.001$ $R^2=0.46$					
(a) Three children or more	Adjusted $R^2=0.42$	0.16	0.08	0.12	1.98	0.05
Postpartum characteristics						
(b) Infant LOS		-0.37	0.19	-0.36	-1.96	0.05
Nursing Interventions:						
(c) Delivery subscale	$F(2,182)=61.78$ $P<0.001$	0.43	0.05	0.48	8.04	<0.001
(d) Content difference subscale	$R^2=0.40$ Adjusted $R^2=0.40$	0.18	0.04	0.30	4.93	<0.001

Research Question 2: Readiness for Discharge between Postpartum Mothers and RNs

There was no evidence of a significant correlation between readiness for hospital discharge among RNs and patients ($r_s = -0.114$; $p = 0.39$). Therefore differences exist in RN and patient perspectives of readiness for hospital discharge.

Research Question 3: Quality of Discharge Teaching in Hospital vs. Home

Results of the related-samples Wilcoxon signed rank test suggests the median of differences between the quality of discharge teaching following birth compared to four weeks post discharge is significantly different.

Qualitative Findings from RHDS and QDTS

Three main themes emerged from the open-ended RHDS and QDTS questions. The first theme was related to the resources. Study participants expressed their appreciation for the various educational resources such as the videos, in-hospital classes, communication with nurses, and information booklet which helped them feel empowered to go home. The second theme was related to the nurses' characteristics, specifically their caring approach, their ability to provide more education when needed and willingness to take time to educate them while demonstrating certain skills. The last theme identified in the open-ended responses was related to specific information. Although a variety of education is covered with patients and families, mothers felt that more emphasis could be placed on whom to call in an event of an emergency, follow-up care, sleep hygiene, breastfeeding at home, and controlling c-section pain.

Research Question 4: Predictors of Post Discharge Coping Difficulty

The significant predictor variables were entered simultaneously into the final regression equation. Based on the results, the F statistic ($F = 6.67$) indicates that the overall model does provide a statistically significant ($p < 0.001$) linear explanation of the variation in PDCDS. Upon further exploration of the antepartum, postpartum, nursing interventions, and RHDS predictor variables, the content received, the content difference between information that was received and information needed, and the readiness for hospital discharge were found to be statistically significant predictors accounting for 38% (adjusted $R^2 = 0.38$) of the variance in post-discharge coping difficulty (Table 4, Model 1). In a subsequent analysis, the content received subscale and the content difference subscale together explained 24% (adjusted $R^2 = 0.24$) of the variance in PDCDS for this study sample (Table 4, Model 1a and b).

Table 4: Predictors of Post Discharge Coping Difficulty Scale

Predictor Variables	Model Statistics	Variable Statistics				
		B	SE B	Standardized β	t	P
Model 1: Nursing Interventions	$F(7,59)=6.67$ $P<0.001$ $R^2=0.44$ Adjusted $R^2=0.38$	0.26	0.09	0.27	2.80	0.007
•Content received subscale	$F(2,64)=11.63$ $P<0.001$	-0.27	0.08	-0.36	-3.23	0.002
•Content difference subscale	$R^2=0.27$ Adjusted $R^2=0.24$	-0.44	0.13	-0.46	-3.31	0.002

(c) RHDS

Utilization of health services. To identify if the content received, the content difference, and the RHDS were predictive of post discharge utilization of services, logistic regression analysis was conducted with each utilization variable as the outcome variable.

The content received, the content difference subscale, and the RHDS were not predictive of any utilization variable. The relationship of the content received, content difference, and the RHDS to utilization was indirect through its association with post discharge coping. PDCDS scores were entered as a predictor variable for each utilization variable. Greater coping difficulty in the post discharge period was associated with more calls to healthcare providers (Table 5). All other variables antecedent to utilization of services in the study model were also entered in the antepartum, intrapartum, postpartum, and nursing interventions/therapeutics groupings for logistic regression analysis of predictors of utilization. The significant predictors of the utilization variables are detailed in Table 5. Mothers who reported poor quality of discharge teaching were more likely to make calls to the hospital, make non-routine office, clinic, urgent care, or emergency visits.

Table 5: Significant Predictors of Post Discharge Utilization

Outcome Variables	Significant Predictor Variables	Logistic Regression Statistics					
		B	SE B	χ^2	Odds Ratio	95% CI	P
Calls to healthcare providers	PDCDS	0.56	0.22	6.24	1.75	(1.13-2.72)	0.01
Calls to hospital	Total QDTS	-1.81	0.87	4.30	0.16	(0.03-0.91)	0.04
Office/Clinic visits	Total QDTS	-1.47	0.64	5.35	0.23	(0.07-0.8)	0.02
Urgent care/Emergency room visits	Total QDTS	-2.48	1.29	3.70	0.08	(0.01-1.05)	0.05

Qualitative Findings from PDCDS

Four main themes emerged from the open-ended questions on the PDCDS. The first two themes were related to the mother's health and the infant's health. The study participants expressed difficulty with their own pain management, overcoming low

energy levels, and overall physical limitations. With their infant's health, participants identified additional assistance with breastfeeding, information on developing a sleep routine, and managing the infant's crying. The third and fourth themes were related to family members and specific information requested for the future. With family members, the participants were challenged with adjusting to family members' new work routines and sleep patterns and introducing a new infant to siblings. Specific information that was requested in discharge teaching was related to potential problems encountered with breastfeeding, outpatient resources, c-section pain management and bleeding precautions, and follow-up calls.

Discussion

Perceptions of readiness for discharge involves a complex interaction between antepartum, intrapartum, and postpartum characteristics including the mother's own physical and emotional status, knowledge about how to care for oneself and their infant, ability to cope with the family's care needs at home, and the support and help in the transition period. Although the majority of mothers reported being ready for discharge, the number of children, infant length of stay, delivery of education, and education content difference (between what was received and what was needed) significantly contributed to the readiness of hospital discharge. Among mothers in this study sample, the factors that had the most influence on readiness for hospital discharge were related to the nursing educational interventions. The delivery of discharge teaching and the amount needed were independently predictive of mothers' perceptions of their readiness to go home. The greater the difference between the received content and the need for content and the greater the nurse's skill and ability in delivering the information, the increased likelihood

that the mother perceived herself as ready for discharge. Similar themes related to the effectiveness of the delivery of information were identified in the qualitative responses.

A statistically significant difference was noted between perceptions of the quality of discharge teaching in the hospital versus home. Mothers may not be able to identify the breadth of their learning needs during the exhausting stages of recovery until they are presented with certain situations at home, nonetheless, as suggested in the qualitative responses, this should be balanced by the frequency and skilled delivery of education, a therapeutic intervention that has benefits in facilitating discharge readiness. This suggests that nurses should focus on patient's educational needs assessment to individualize their education and identify the most effective manner of delivering the content to facilitate retention of education. Furthermore, the provision of outpatient resources is needed to support mothers and families by providing additional education as they transition home.

Upon considering the significance of postpartum mothers' perceptions of readiness for discharge and quality of discharge teaching, it is important to note that the mothers in this study all had relatively "normal" postpartum courses and "healthy" newborns, yet those who felt less ready for discharge had greater difficulty coping at home which resulted in more non-routine calls to healthcare providers. Furthermore, those mothers who felt they received poorer quality of discharge teaching had more calls to the hospital, non-routine office/clinic visits, and emergency room/urgent care visits. Similar themes related to additional information needed were noted in the qualitative post discharge coping responses. Assessment of the lack of readiness for hospital discharge and the quality of teaching throughout the course of childbirth experience may assist in

identifying mothers at risk for difficulty in coping at home following discharge at a time when anticipatory interventions could be implemented to effectively promote a safe transition home and optimal post discharge outcomes.

Limitations to consider in this study are the only source of data was postpartum mothers' reports of perceptions regarding their readiness for hospital discharge, quality of discharge teaching, post discharge coping difficulty and self-reports of service utilization. No additional information was collected regarding the reason for the calls/visits to assess appropriateness of actions. Although these perceptions reflect mothers' realities, they may not represent the clinical reality of actual teaching that was provided.

Implications for Nursing Practice

The trajectory of influence at each period of the childbirth experience, especially during the postpartum period, suggests that each phase plays an important role in readiness for discharge which is then associated with greater post-discharge coping and decrease health care utilization. The influence of the quality of discharge teaching to readiness for hospital discharge and post discharge coping provides evidence of the critical role of nurses in teaching to promote proximal maternal-neonatal outcomes. The skill of the nurse in delivering education requires as much emphasis as the needs assessment and the content in the design of patient education programs and the professional development of nursing staff. The elements of skilled teaching as measured by the QDTS provide a guide for skill building where the results demonstrate the valued-added content presented in excess of the mother's stated need. Mothers inevitably feel ready for discharge and more confident post discharge when they feel knowledgeable and convinced in their ability to cope with caring for themselves, their newborns, and

families. Additionally, teaching provided throughout the antepartum, intrapartum, and postpartum periods should be an anticipatory intervention that requires attention to the adequacy of delivery using teaching approaches that assess the patient's educational needs and facilitate the translation of content to health promoting self and infant care behaviors at home. The result can inform structures such as policies and guidelines of care, and processes such as teach back methods addressing the delivery of information given to mothers and families.

Patient perceptions of discharge readiness can be both a process measure to identify patients in need of additional interventions before, during, and after discharge and a nurse-sensitive outcome measure of the postpartum hospitalization experience. Assessment of the quality of discharge teaching and readiness for discharge should be part of discharge preparation for every patient. However, individualized definitions of readiness should be taken into consideration to enhance the provision of services mitigating the impact on health care outcomes and facilitating the identification of non-predetermined situations affecting readiness along with strategies for addressing them. These strategies might include reinforcing of teaching before and after discharge, engaging family members in post discharge support, or arranging for post discharge surveillance and continuation of teaching by home health services. Building systems of care that routinely assess discharge preparation and post discharge outcomes will promote optimal short- and long-term outcomes of the post-childbirth experience.

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Appendices – IRB Approval

ENTERED
11/04/14

Institutional Review Board Project Action Summary

Action Date: November 4, 2014 *Note: Approval expires one year after this date.*

Type: ☐ New Full Review ☐ New Expedited Review ☐ Continuation Review ☒ Exempt Review
☐ Modification

Action: ☒ Approved ☐ Approved Pending Modification ☐ Not Approved

Project Number: 2014-10-062

Researcher(s): Gabriella Malagon-Maldonado Doc SON
Dr. Cynthia D. Connelly Fac SON

Project Title: Antepartum, Intrapartum, and Postpartum Predictors of Readiness for Hospital Discharge and Post-Discharge Outcomes

Note: We send IRB correspondence regarding student research to the faculty advisor, who bears the ultimate responsibility for the conduct of the research. We request that the faculty advisor share this correspondence with the student researcher.

Modifications Required or Reasons for Non-Approval

None

The next deadline for submitting project proposals to the Provost's Office for full review is N/A. You may submit a project proposal for expedited review at any time.

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