LEVEL OF UNCERTAINTY PERCEIVED BY WOMEN HOSPITALIZED WITH HIGH-RISK PREGNANCY

By

MARION ISOBELLE CLAUSON
B.S.N., University of British Columbia, 1971

A THESIS SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTER OF SCIENCE IN NURSING

in

THE FACULTY OF GRADUATE STUDIES

(School of Nursing)

We accept this thesis as conforming to the required standard

THE UNIVERSITY OF BRITISH COLUMBIA

April 1992

© Marion Isobelle Clauson, 1992
In presenting this thesis in partial fulfilment of the requirements for an advanced degree at the University of British Columbia, I agree that the Library shall make it freely available for reference and study. I further agree that permission for extensive copying of this thesis for scholarly purposes may be granted by the head of my department or by his or her representatives. It is understood that copying or publication of this thesis for financial gain shall not be allowed without my written permission.

(Signat)

Department of **SCHOOL OF NURSING**
The University of British Columbia
Vancouver, Canada

Date **APRIL 27, 1992**
Abstract

This descriptive correlational study was designed to determine the perceived level of uncertainty of women hospitalized with high-risk pregnancy. The study investigated the difference between levels of uncertainty at 48 hours after admission and at the time of discharge. The relationships between uncertainty and factors that might influence this uncertainty such as parity, length of stay, maternal age and gestational age were also investigated. The Mishel (1988) theory of uncertainty in illness and Snyder’s (1979) framework of an altered trajectory of high-risk pregnancy guided this study.

A convenience study of 58 women who were admitted to the antepartum units of a tertiary obstetrical hospital completed the Uncertainty Stress Scale-High-Risk Pregnancy Version (USS-HRPV) and a patient information sheet. The subjects were approached by the researcher and voluntarily completed a questionnaire shortly after admission and again upon discharge.

Overall, the high-risk women perceived moderately low levels of uncertainty at 48 hours after admission and these levels dropped significantly by the time of discharge. The nature of the uncertainty experienced upon admission was related to not knowing the cause of the high-risk condition or symptoms, and to concerns about the stability of the condition and about the baby’s chances to be healthy. At the time of discharge, the uncertainty was generated by the unpredictability of symptoms, by not knowing how long the symptoms will last and by concern about the baby.

No significant difference was found between uncertainty levels of primigravidas and multigravidas either at admission or at discharge. Although a tendency was found for
uncertainty to decrease as maternal age increased, there was no significant relationship. A significant negative relationship was demonstrated between uncertainty and gestational age. A significant positive relationship was found between uncertainty and length of stay, as well as overall perception of stress.

The findings of this study were discussed in relation to other research studies, the theoretical framework, and methodological problems inherent to the study. Implications for nursing practice, theory and education and recommendations for future research were identified.
# Table of Contents

Abstract ................................................................................................................. ii

Table of Contents .................................................................................................. iv

List of Tables ......................................................................................................... vii

List of Figures ......................................................................................................... viii

Acknowledgements ................................................................................................. ix

CHAPTER ONE: Introduction
  Background to the Problem .................................................................................. 1
  Problem Statement ................................................................................................. 4
  Purpose .................................................................................................................. 4
  Theoretical Framework ......................................................................................... 5
    Holistic Model of the Childbearing Experience ................................................. 5
    Uncertainty .......................................................................................................... 8
  Research Questions ............................................................................................... 12
  Significance of the Research ................................................................................. 12
  Definition of Terms .............................................................................................. 13
  Assumptions .......................................................................................................... 14
  Limitations ............................................................................................................ 14
  Organization of the Thesis ..................................................................................... 15

CHAPTER TWO: Review of the Literature
  Introduction ........................................................................................................... 16
  High-Risk Pregnancy ............................................................................................ 16
  Uncertainty ............................................................................................................ 22
  Factors Influencing Uncertainty .......................................................................... 27
  Summary of the Literature Review ....................................................................... 29

CHAPTER THREE: Methods
  Introduction ........................................................................................................... 30
  Research Design ................................................................................................... 30
  Sample ................................................................................................................... 30
  Data Collection Procedure ................................................................................... 31
  Instruments for Data Collection .......................................................................... 31
    Uncertainty Stress Scale .................................................................................... 31
    Patient Information Sheet .................................................................................. 34
  Data Analysis ........................................................................................................ 35
  Ethics and Human Rights ...................................................................................... 35
CHAPTER FOUR: Presentation and Discussion of Results

Introduction ................................................................. 37
Characteristics of the Sample ........................................... 37
  Demographic Characteristics of the Sample ..................... 38
  Pregnancy-related Characteristics of the Sample ............... 39
  Health Status of the Sample ....................................... 41
  Length of Stay in Hospital ......................................... 41
Findings ....................................................................... 42
  Research Question 1: What is the perceived level of uncertainty 48 hours after admission? .......... 42
  Research Question 2: What is the perceived level of uncertainty at time of discharge? ............ 44
  Research Question 3: What is the difference between perceived levels of uncertainty at 48 hours after admission and at time of discharge? 47
  Research Question 4: What is the difference between level of uncertainty in primigravidas and multigravidas? 47
  Research Question 5: What is the relationship between uncertainty and length of hospital stay? 48
  Research Question 6: What is the relationship between uncertainty and maternal age? .......... 48
  Research Question 7: What is the relationship between uncertainty and gestational age? ....... 48
Ancillary Findings ........................................................... 48
  Stress of Uncertainty ............................................... 49
  Uncertainty and Threat .............................................. 51
  Uncertainty and Positive Feelings ................................. 51
  Uncertainty and Sample Characteristics .......................... 53
Discussion ....................................................................... 54
  Characteristics of the Sample ..................................... 54
  Uncertainty ............................................................... 57
  Uncertainty and Parity ............................................... 65
  Uncertainty and Length of Stay .................................... 66
  Uncertainty and Maternal Age ...................................... 68
  Uncertainty and Gestational Age ................................. 68
Discussion of Ancillary Findings ...................................... 70
  Stress of Uncertainty ............................................... 70
  Feelings Generated by Uncertainty ............................... 72
Summary ....................................................................... 74
CHAPTER FIVE: Summary, Conclusions, Implications and Recommendations

Introduction ......................................................... 76
Summary ............................................................... 76
Conclusions ......................................................... 80
Implications for Nursing Practice and Theory ...................... 81
Recommendations for Future Research ............................... 85

References .......................................................... 88

Appendices
Appendix A: Introductory Letter .................................. 93
Appendix B: Uncertainty Stress Scale-High Risk Pregnancy Version ........ 95
Appendix C: Letter Explaining Consent ......................... 99
Appendix D: Letter to Physician .................................. 101
Appendix E: Patient Information Sheet ......................... 103
Appendix F: Rank Ordering of Uncertainty Items at Time 1 ............ 105
Appendix G: Rank Ordering of Uncertainty Items at Time 2 .......... 110
List of Tables

<table>
<thead>
<tr>
<th>Table</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>Age Distribution for Sample</td>
<td>38</td>
</tr>
<tr>
<td>II</td>
<td>Education Level of the Sample</td>
<td>38</td>
</tr>
<tr>
<td>III</td>
<td>Gestational Age of the Sample</td>
<td>39</td>
</tr>
<tr>
<td>IV</td>
<td>Number of Pregnancies</td>
<td>40</td>
</tr>
<tr>
<td>V</td>
<td>Reported Reasons for Admission</td>
<td>41</td>
</tr>
<tr>
<td>VI</td>
<td>Length of Stay in Hospital</td>
<td>42</td>
</tr>
<tr>
<td>VII</td>
<td>Total Uncertainty for Hospitalized Antepartum Women 48 Hours after Admission</td>
<td>43</td>
</tr>
<tr>
<td>VIII</td>
<td>Overall Uncertainty Level: Visual Analogue-Time 1</td>
<td>44</td>
</tr>
<tr>
<td>IX</td>
<td>Frequency and Distribution of the Top Five Uncertainty Items at Time 1</td>
<td>44</td>
</tr>
<tr>
<td>X</td>
<td>Total Uncertainty for Hospitalized Antepartum Women at Time of Discharge</td>
<td>45</td>
</tr>
<tr>
<td>XI</td>
<td>Overall Uncertainty Level: Visual Analogue-Time 2</td>
<td>46</td>
</tr>
<tr>
<td>XII</td>
<td>Frequency and Distribution of the Top Five Uncertainty Items at Time 2</td>
<td>46</td>
</tr>
<tr>
<td>XIII</td>
<td>Level of Uncertainty: Primigravidas vs. Multigravidas</td>
<td>47</td>
</tr>
<tr>
<td>XIV</td>
<td>Total Uncertainty Stress Score for Hospitalized Antepartum Women at Time 1 and Time 2</td>
<td>50</td>
</tr>
<tr>
<td>XV</td>
<td>Overall Stress from Uncertainty at Time 1 and Time 2: Visual Analogues</td>
<td>50</td>
</tr>
<tr>
<td>XVI</td>
<td>Overall Threat from Uncertainty at Time 1 and Time 2: Visual Analogues</td>
<td>50</td>
</tr>
<tr>
<td>XVII</td>
<td>Overall Positive Feelings at Time 1 and Time 2: Visual Analogues</td>
<td>53</td>
</tr>
</tbody>
</table>
List of Figures

Figure 1  A Holistic Model of the Childbearing Experience  .......... 7
Figure 2  Possible Alterations of the Trajectory of Childbearing  .......... 8
Figure 3  Model of Perceived Uncertainty in Illness  .................. 10
Acknowledgements

I am indebted to the women who shared their perceptions during their period of hospitalization and to the Antepartum nursing staff of Holly and Dogwood Squares who assisted so willingly in approaching the women about the study. Elaine Carty and Ann Hilton provided expert guidance and ongoing support and encouragement through each phase of the study. Laurie Hasiuk’s clerical skills were invaluable and Lenore Riddell offered continual support and friendship through the uncertain times. My nursing colleagues at Grace Hospital have consistently offered support and understanding during this journey through the research process. Finally, the love and support of my children, David and Robyn and my husband, Bruce have been a constant source of strength.
CHAPTER ONE

Introduction

Background to the Problem

Advances in perinatal care in the past decade have resulted in increasing numbers of women with high-risk pregnancies being hospitalized for assessment and specialized care. High-risk pregnancy units provide maternal-fetal surveillance in order to safely prolong a complicated pregnancy when the fetus is immature, or to plan delivery when either the mother’s or infant’s health is in jeopardy (Williams, 1986).

The incidence of high-risk pregnancy is estimated to range from 10-20%, with approximately 10% of these women requiring hospitalization of two weeks or more (Kemp & Page, 1986). Therefore, of the 42,732 births in B.C. in 1988 (Ministry of Health, 1988), between 4,273 and 8,546 pregnancies would be classified as high-risk using the incidence quoted in Kemp and Page (1986).

Grace Hospital is the tertiary obstetrical center providing high-risk care to women throughout British Columbia. There are approximately 150 admissions per month to the inpatient antepartum units (S. Anthony, personal communication, January, 1992). In 1991, the average length of stay on the antepartum units was between four and six days, with approximately 10% of women staying 10 days or longer and approximately 2.5% of women staying longer than one month (Antepartum Unit statistics, 1991).

The high-risk antepartum woman is facing the experience of pregnancy, which is considered to be a normal developmental crisis, requiring many predictable physical, emotional, social and cultural adjustments on the part of the woman (Snyder, 1979). In
addition, the high-risk mother must deal with the recognition that her pregnancy may not progress normally, and also that the childbirth experience may be complicated by risk factors which threaten either her health or the baby's health and reduce the predictability of the outcome for both (Mercer, May, Ferketich and DeJoseph, 1986). This unpredictability may give rise to the perception of uncertainty about what is best for herself and her baby, and about how she will successfully navigate the tasks of pregnancy.

Uncertainty during pregnancy appears to be universally experienced in our culture, and may involve an inability to determine the meaning of pregnancy-related events (Sorenson, 1990). Concerns during pregnancy, coupled with the uncertainty surrounding labour and birth, generate stress and anxiety as the pregnant woman attempts to interpret and adapt to the events of childbirth.

Mishel (1988) defines uncertainty as the inability to determine the meaning of illness-related events and suggests that it may occur in a situation in which a person is unable to adequately appraise the situation or to predict outcomes accurately. In addition to unpredictability of a situation, uncertainty may arise from ambiguity, complexity and lack of information (Mishel, 1988). Mishel (1984) also proposes a model to explain the relationship of uncertainty to stress resulting from hospitalization.

Nurses have observed that women hospitalized with high-risk pregnancies may experience increased psychological stress and have difficulty adapting to their altered situations (Merkatz, 1976; Rosen, 1975). Carty, Crawford and Ross (1990), describe women's experiences during high-risk events as being a roller coaster of instability and stability, with unpredictability and altered expectations creating a sense of loss of a
normal pregnancy. During the unstable periods, denial, disbelief, anger, guilt, fear and anxiety were described by these high-risk women.

White and Ritchie (1984), developed an Antepartum Hospital Stressor Inventory which identified seven categories of stressors that women experienced while hospitalized with high-risk conditions. These included, in order of highest intensity of stress to lowest: separation from home and family, disturbing emotions, family status, health status, self-image, with health professionals and environment. Although there was no significant relationship found between selected patient characteristics and levels of stress, there was evidence that women experienced an increase in the intensity of stress after two weeks in hospital. Thus, it appears that length of hospital stay may be related to increased stress for women with high-risk pregnancies. Is length of stay also related to their level of uncertainty?

When women are classified as high-risk because of a complicated previous pregnancy, the threat of a difficult pregnancy, a sick or immature baby, or even the loss of the baby is invariably stressful (Hales & Johnson, 1990). First-time mothers over the age of thirty-five may be designated as high-risk because of the increased frequency of pregnancy-induced hypertension, gestational diabetes, preterm labour and miscarriage (Hales & Johnson, 1990), and thus may experience increased stress and uncertainty. The relationship between maternal age, parity, gestational age and uncertainty is unknown.

There has been little study of uncertainty in pregnancy and no literature has been found to address uncertainty in women with high-risk pregnancies. A better understanding
of the uncertainty experienced by women hospitalized with high-risk pregnancies will
enable nurses to plan effective care and promote maternal well-being.

**Problem Statement**

Women with high-risk pregnancy conditions experience alterations in the normal
course of pregnancy and may require hospitalization for assessment and specialized care.
Hospitalization may resolve the at-risk condition and ensure the health and safety of both
mother and baby. However, often the outcome is unpredictable, giving rise to many
stressors, and women do not know how their high-risk conditions will affect themselves,
their babies, or future pregnancies. Over time in hospital, women experience periods of
stability and instability (Carty, Crawford & Ross, 1990), and the unpredictability of the
experience may lead to uncertainty. As well, parity, maternal age and increasing
gestational age may be related to level of uncertainty.

Little research has been done on uncertainty in pregnancy. No studies have been
found which describe the level of uncertainty of women hospitalized with high-risk
pregnancies, or which relate uncertainty to length of stay, parity, maternal age and
gestational age.

**Purpose**

The purpose of this study was to describe how women hospitalized with high-risk
pregnancy perceive the uncertainties and certainties in their situation. In addition, the
study investigated the relationship between uncertainty and factors which may influence
this uncertainty, such as length of hospital stay, parity, maternal age and gestational age.
Theoretical Framework

The theoretical framework for this study is derived from two areas in the literature. Although the special needs of high-risk antepartum women are not well documented, Snyder (1979) developed a holistic model of the childbearing experience which views the high-risk woman as a woman facing the experience of childbirth and also as one for whom the experience will have an altered trajectory which may be unpredictable.

The concept of uncertainty is derived from the work of Mishel (1981, 1984, 1988, 1990), on uncertainty in relation to the perception of hospital events as stressful. Mishel (1981) conceptualized uncertainty as a perceptual variable influencing the appraisal of illness-related events, and taking the form of ambiguity, vagueness, unpredictability and lack of information. Mishel quantified uncertainty through the development of the Uncertainty in Illness Scale (Mishel, 1981).

Thus for the high-risk antepartum woman, the experience of unpredictability in pregnancy may be better understood within the context of a model of uncertainty, which relates uncertainty to the stress resulting from hospitalization.

Holistic Model of the Childbearing Experience

Snyder (1979) views the high-risk mother in relation to a holistic model of the childbearing experience, in which the high-risk antepartum woman is, first, a woman facing the experience of childbearing and, second, a woman for whom this experience has been defined as high-risk. Snyder ascribes to Rubin’s (1976) description of childbearing as a multidimensional experience which is influenced by physiological, societal,
psychological and cultural factors. These factors interact to make up a holistic experience for each individual woman.

The model is represented as a series of concentric circles, each relating to a facet of the childbearing experience (Figure 1). Around the core of the physiological pregnancy are the psychological processes (ie. incorporation of the maternal role into the self-system), and the broader dynamics and values of peers, family, society and culture. Each of the parts of the model can be identified for any woman experiencing childbearing; the individuality of each experience arises from the constant, unpredictable interactions of the individual parts of the model to form a unique and complex whole (p. 168).

Snyder adapts the concept of trajectory, borrowed from physics, to elaborate on the element of time in relation to childbearing (Figure 2). The normal trajectory of pregnancy is seen as having a predictable course and duration (usually full-term), which provides a basis for definition of expected needs and behaviours throughout all layers of the model. The pregnancy which proceeds normally allows the expectations of the woman, her family and society to be fulfilled.

When the expected trajectory is altered and becomes unpredictable due to high-risk conditions, the woman and those around her must learn to cope with threats to the health of herself and her baby, new demands and restrictions, and the possibility of premature termination of the pregnancy. If existing coping behaviours cannot be reorganized and are no longer adequate for dealing with new stresses and demands, the result may be confusion, frustration and uncertainty. Thus, Snyder's model provides a context for viewing the uncertainty of women hospitalized with high-risk pregnancy.
Figure 1  A holistic model of the childbearing experience

adapted from: Snyder, D.J. (1979). The high-risk mother viewed in relation to a holistic model of the childbearing experience. JOGN, 8, (3), 165.
Figure 2 Some possible alterations of the trajectory of childbearing by high-risk occurrences

adapted from: Snyder, D.J. (1979). The high-risk mother viewed in relation to a holistic model of the childbearing experience. JOGN, 8, (3), 168.

Uncertainty

Mishel (1981) explored the role of uncertainty as a significant variable influencing patients' experiences in illness, treatment and hospitalization. She proposed a theory on uncertainty in illness based on a cognitive appraisal model derived from work by Lazarus (1974), Moos (1977), Norton (1975) and Shalit (1977). Mishel (1984) went on to examine uncertainty in relation to the perception of hospital events as stressful. Support was found for the relationship of uncertainty to stress, with the suggestion that vagueness, lack of clarity and lack of information about events accounted for their evaluation as stressful, rather than the events themselves.
Uncertainty is defined as the inability to determine the meaning of illness-related events. It is the cognitive state created when the person cannot adequately structure or categorize an event because of the lack of sufficient cues. Uncertainty occurs in a situation in which the decision maker is unable to assign definite value to objects or events and/or is unable to predict outcomes accurately (Mishel, 1984).

The uncertainty theory is organized around three major concepts: antecedents of uncertainty, the process of uncertainty appraisal, and coping with uncertainty (Figure 3). Three antecedents of uncertainty are stimuli frame, cognitive capacity and structure providers. Stimuli frame refers to the form, composition and structure of the stimuli that the individual perceives and has three components. Symptom pattern refers to the degree to which symptoms present with sufficient consistency to be seen as having a pattern, enabling determination of meaning. Event familiarity describes the degree to which the situation is repetitive or contains recognized cues, allowing memory association in the derivation of meaning. The third component is event congruency, referring to the consistency between the expected and the experienced in illness-related events. Consistency implies reliability and facilitates interpretation and understanding. These three components provide the stimuli used by the patient to create an interpretation of events, and thus their uncertainty appraisal (Mishel, 1988).

Two variables are thought to influence the stimuli frame: cognitive capacity and structure providers. Cognitive capacity refers to the information-processing abilities of the individual. Structure providers are the resources available to assist the person in the
Figure 3 Model of perceived uncertainty in illness

interpretation of the stimuli frame, and consist of educational level, social support and credible authority.

During an illness event, the individual processes stimuli in order to construct a cognitive schema of the event. When meaning cannot be derived, uncertainty results. Uncertainty has four forms: ambiguity, complexity, lack of information and unpredictability (Mishel, 1988). When uncertainty occurs, there is potential for diverse evaluation and outcome. Uncertainty may be appraised as a danger, with coping strategies employed to reduce uncertainty and potential harm. When uncertain events are appraised as opportunity, a positive outcome is implied and coping strategies are implemented to maintain uncertainty. The implementation of effective coping strategies enables adaptation to occur, regardless of the way the uncertainty was appraised.

In summary, the model of uncertainty provides a framework within which to view the experience of women who have been hospitalized with high-risk pregnancy. Because appraisal is a continuing process, it is reasonable that perceptions of uncertainty would change from admission to discharge when the risk to the pregnancy may have been reduced. It is likely that the risk to the pregnancy would be higher for those women hospitalized earlier in pregnancy, thus affecting perceived uncertainty. In addition, experience with previous pregnancies as well as a woman’s life experiences may influence uncertainty.
Research Questions

This study was designed to answer the following research questions for women who have been hospitalized with high-risk pregnancy:

1. What is the perceived level of uncertainty 48 hours after admission?
2. What is the perceived level of uncertainty at time of discharge?
3. What is the difference between perceived levels of uncertainty at 48 hours after admission and at time of discharge?
4. What is the difference between level of uncertainty in primigravidas and multigravidas?
5. What is the relationship between uncertainty and length of hospital stay?
6. What is the relationship between uncertainty and maternal age?
7. What is the relationship between uncertainty and gestational age?

Significance of the Research

The significance of this research for the nursing profession is that the findings will provide a better understanding of the degree of uncertainty experienced by the woman who is hospitalized with a high-risk pregnancy. This knowledge is important in understanding women’s responses to hospitalization and to their high-risk condition, and will assist nurses in helping these women cope more effectively during the hospital stay.

Awareness of the degree and nature of uncertainty in women hospitalized with high-risk pregnancies will enable identification of nursing interventions that may reduce uncertainty. Knowledge of the relationship of uncertainty to such factors as length of hospital stay, parity, maternal age and gestational age may provide information that can be
utilized by health care professionals in planning and implementing educational and supportive programs to meet the specific needs of these patients. Greater knowledge of uncertainty will also facilitate counselling and communication between the nurse and the patient.

In addition, exploration of the concept of uncertainty will add to the body of nursing knowledge and enhance the generalizability of the theory. To date, no nursing research has been found which addresses the uncertainty experienced by women hospitalized with high-risk pregnancies.

**Definition of Terms**

**High-risk pregnancy:** a pregnancy in which physiologic and/or psychologic factors exist in the mother or fetus that imply a threat to the health of the maternal-fetal unit, and increase the possibility of suffering harm, damage, loss or death (adapted from Kemp & Page, 1986 and Olds, London & Ladewig, 1984).

**Uncertainty:** the inability to determine the meaning of illness-related events. It is the cognitive state created when the person cannot adequately structure or categorize an event because of lack of sufficient cues. It occurs in a situation in which the decision maker is unable to assign definite value to objects or events and/or is unable to predict outcomes accurately (Mishel, 1988). Uncertainty will be measured by the Uncertainty Stress Scale-High-Risk Pregnancy Version (USS-HRPV), which was adapted from the Uncertainty Stress Scale (USS) developed by Hilton (1987).

**Tertiary obstetrical centre:** a research and teaching center providing high-risk obstetrical care for antepartum women from a large geographical area.
**Parity:** the condition of having borne offspring who had attained the age of viability (Olds, London & Ladewig, 1984).

**Primigravida:** a woman who is pregnant for the first time (Olds, London & Ladewig, 1984).

**Multigravida:** a woman who has been pregnant more than once (Olds, London & Ladewig, 1984).

**Gestational age:** the number of complete weeks in fetal development, calculated from the first day of the last normal menstrual cycle (Olds, London & Ladewig, 1984).

### Assumptions

For the purposes of this study, the following assumptions were made:

1. Subjects are the most legitimate source of information about their level of uncertainty.

2. Subjects will respond honestly to the questionnaires used.

### Limitations

This study has the following limitations:

1. As only one tertiary maternity facility exists in B.C., a convenience sample from the high-risk antepartum units in this facility will be used. Thus, the sample may not be representative of the population of women with high-risk pregnancies.

2. The findings of this study are not generalizable to other patient groups.
Organization of the Thesis

This thesis is comprised of five chapters. In Chapter One, the background to the problem, problem statement, purpose, theoretical framework, research questions, significance of the research, definitions, assumptions and limitations have been presented. In Chapter Two, a review of selected literature pertinent to the identified research problem will be presented. Chapter Three will address the research methodology including a description of the research design, sampling procedure, data collection instruments and procedure, ethics and human rights, and data analysis. In Chapter Four, the description of the sample, findings, and a discussion of the results will be presented. The summary, conclusions, implications for nursing practice, and recommendations for future research will be presented in Chapter Five.
CHAPTER TWO

Review of the Literature

Introduction

The purpose of this chapter is to present an analysis of selected literature relating to the areas of interest which emerge from the theoretical framework. The first section addresses the empirical and theoretical knowledge in the literature which pertains to women hospitalized with high-risk pregnancy. The second section provides an overview of literature that relates to uncertainty, including uncertainty in pregnancy. The final section addresses factors that could influence uncertainty, such as length of hospital stay, parity, maternal age and gestational age.

High-Risk Pregnancy

High-risk pregnancy may be defined as a pregnancy in which physiologic and/or psychologic factors exist in the mother or fetus that imply a threat to the health of the maternal-fetal unit, and increase the possibility of suffering harm, damage, loss or death (adapted from Kemp & Page, 1986 and Olds, London & Ladewig, 1984). The advent of the speciality of perinatal medicine has created a new focus on the needs of women with high-risk pregnancies. Although the literature abounds with research on the general subject of normal pregnancy, the empirical and theoretical knowledge concerning high-risk pregnancy is limited. Thus, high-risk pregnancy is frequently described in the literature in relation to adaptations of the normal developmental tasks of pregnancy.

Clark and Alfonso (1979) described four developmental tasks which must be accomplished in order for mothering and attachment behaviours to occur: pregnancy
validation, fetal embodiment, fetal distinction and role transition. Gilbert and Harmon (1986) suggested that high-risk pregnancy creates a great deal of interference with the accomplishment of these tasks. A woman with ominous physical signs of illness along with fears for her own well-being may have heightened ambivalence about the pregnancy and have difficulty validating the pregnancy. Hospitalization for maternal illness may cause prolonged separation from family and increased dependency needs, causing difficulty with incorporating the fetus into the body image. If hospitalization occurs during the time of viewing the fetus as a distinct being, preparations for the baby and for parenthood may be interfered with. Preparation for the birth process may be out of the mother’s control if her well-being is in doubt, leading to frustration and anxiety, and difficulty with role transition.

Rubin (1975) described four broad areas of psychosocial work done by a woman during pregnancy: seeking safe passage for herself and her baby, ensuring acceptance of the child by significant others, binding-in to her unknown child and learning to give of herself. An impasse or interference in any one task area is seen to be directly related to severe stress in maintaining the pregnancy, as in prematurity or toxemia (p. 145).

Wohlreich (1986) described the effects of high-risk pregnancy on a woman’s psychological functioning. This author suggested that the woman with a history of infertility or obstetric losses may have unresolved grief, guilt or uncertainties about her ability to become a mother. The resulting ambivalence or doubt, along with the anticipation of loss of this pregnancy can interfere with the normal processes of attachment and hopeful expectation (p. 56). The normal ambivalence of the first trimester
may also be heightened if there is the likelihood of damage to the fetus. In addition, other obstetric complications which arise suddenly and unexpectedly can transform a routine pregnancy into a harrowing medical and psychological roller coaster that shatters previous plans and hopes for the pregnancy (p. 57).

Wohlreich (1986) also described the responses of women to high-risk obstetrical management and hospitalization. The uncertain outcome and the increased frequency of obstetrical visits and fetal surveillance procedures leave a woman torn between anxieties about potential fetal damage and fears of not doing everything possible to improve the outcome. If prolonged hospitalization becomes necessary, Wohlreich suggested that increased ambivalence, coupled with guilt and conflicts about dependency are demonstrable in these women (p. 60). However, there was no empirical evidence presented to substantiate these statements.

Kemp and Hatmaker (1989) studied the relationships among psychological and physiological indices of stress, social support and risk in pregnancy with groups of low-risk and high-risk women. Their findings supported the belief that women with high-risk pregnancy experience greater physiological stress than women with a low-risk pregnancy, as evidenced by significant differences in urinary epinephrine levels. However, there were no significant differences between state anxiety scores or social support scores in the two groups. The limitations in this study included a small sample size (n=19 high-risk and 20 low-risk women) and the inability to control other factors that influence catecholamine levels, such as food intake and exercise. The authors concluded that there may be a
generalized physiological stress response to risk during pregnancy, while the psychological response may be influenced more by individual factors.

Nurses have reported that women hospitalized with high-risk pregnancies experience anxiety and stress. According to Monahan and DeJoseph (1991), women with preterm labour face stressors such as uncertain pregnancy outcome, fears for the health of the fetus and mother, loss of control over self and the pregnancy, hospitalization, reallocation of roles and tasks in the home, the need to obtain assistance from outside the family, unsupportive reactions of others, financial strains and reduced childbirth options. Rosen (1975) studied the problems of adapting to prolonged hospitalization of one obstetrical patient, over a 14 week period. Unstructured interviews with the patient and conversations with staff revealed anger, hostility and irritation related to senseless hospital routines, being in a helpless, dependent patient role, and being separated from family.

Williams (1986) viewed the hospitalization experience of high-risk antepartum women from the nurse’s perspective, suggesting that the inevitable stresses and uncertainties about maternal and neonatal health require the nurse to respond with in-depth patient teaching and preparation for returning home.

Descriptions of stressors encountered in antepartum hospitalization have been very limited. In a study by White and Ritchie (1984), the stressors of 61 hospitalized antepartum women were described using the Antepartum Hospital Stressors Inventory (ASHI), which includes seven categories of potential stressors. Separation from home and family and disturbing emotions were ranked the highest, followed by changing family circumstances, health concerns, changing self-image, hospital environment and
communications with health professionals. Examples of specific stressors include: thinking about my health and my baby’s health, thinking about the results of tests, trying to understand medical terms and explanations of tests, thinking about being a mother, and feeling worried and scared. The authors suggested that hospitalization could interfere with completion of the normal tasks of pregnancy, and reduce ability to cope with the demands of an at-risk pregnancy.

One phenomenological study was found that explored the thoughts and feelings expressed by a sample of 11 at-risk prenatal clients hospitalized for more than five days (Loos & Julius, 1989). The results revealed experiences of loneliness, boredom and powerlessness. Ten of the women expressed distress regarding their inability to be in control of their pregnancies, feeling as if their whole lives were on hold (p. 54). Although descriptive of the women’s feelings, the data presented are limited and further study would be helpful.

Several reports of peer support groups for hospitalized antepartum women were found in the literature (Dore & Davies, 1979; Snyder, 1988). These groups appear to provide emotional support for these women and result in reduced hostility, depression and boredom, enabling adaptation during the hospital stay. However, empirical testing has not been carried out.

Unpublished work by Carty, Crawford and Ross (1990) described the experiences of hospitalized high-risk antepartum women at Grace Hospital in Vancouver. This qualitative study used Snyder’s (1979) framework and involved interviews with 10 women who had been hospitalized for 10 days or longer. Preliminary results of the study
confirmed that women experienced strong disruptive emotions including powerlessness, anxiety and frustration, as they dealt with the sometimes "invisible" illness that disrupted their family functioning. The central theme of the experience was found to be coming to terms with losses related to self, family and the environment. It was also found that the hospitalization experience took one of three paths: unstable until delivery; unstable, then stable until delivery; or the roller coaster effect of unstability and stability continuously until delivery.

The effects of high-risk pregnancy on the family have also been studied (Merkatz, 1978), and theoretical models for predicting and assessing the impact of antepartum stress on the family have been developed (Mercer et al, 1986, 1988). Mercer et al (1986) suggested that stressors such as pregnancy complications that threaten either the mother’s or the infant’s health can reduce the predictability of the outcome for both, and produce additional challenges for the family as a whole. In a study by Mercer et al (1988), high-risk women reported significantly less optimal family functioning than low-risk women.

Weil (1981) described four areas of concern of families during high-risk pregnancies: fear for baby’s well-being; financial cost of high-risk care; fear of sexual activities harming the baby; and disrupted marital and social relationships. Kemp and Page (1986) developed a conceptual model depicting four major concepts that nurses could consider in determining how a family is integrating, interpreting and adapting to a high-risk pregnancy: health status of the pregnancy, the family’s perception of the high-risk pregnancy, support available to the family, and the family’s adaptation to a high-risk
pregnancy. The authors suggested a variety of nursing interventions to assist these families, but no empirical evidence was provided to support the model.

In summary, the literature relating to uncertainty in high-risk pregnancy included several articles which were only descriptive or anecdotal in nature, with no clear evidence of supportive research data. Several studies were found which presented evidence related to antepartum stress and hospitalization, the women’s experience of antepartum hospitalization and family stress with antepartum hospitalization. However, the uncertainty of hospitalized high-risk antepartum women does not appear to have been studied or well documented in the literature.

**Uncertainty**

Uncertainty has been variously defined in the literature. According to McIntosh (1974), uncertainty is a cognitive state that occurs in a situation when the decision-maker is unable to assign definite values to objects and events and/or is unable to accurately predict outcomes. Budner (1962) described an uncertain situation as one that cannot be adequately structured because a number of cues are lacking.

Lazarus and Folkman (1984), in explaining their model of cognitive appraisal in relation to stress and coping, used the term event uncertainty rather than predictability to discuss how the likelihood of an event’s occurrence influences appraisal. These authors suggested that event uncertainty is stressful because it has an immobilizing effect on anticipatory coping processes. "The coping strategies for anticipating an event’s occurrence are often incompatible with strategies needed to anticipate the event’s nonoccurrence" (p. 91). They also describe temporal uncertainty as not knowing when an
event is going to happen (p. 101). When cues are insufficient, or are difficult to perceive clearly, a cognitive structure of the event cannot be formed, preventing satisfactory appraisal and coping.


A model of perceived uncertainty in illness, developed by Mishel (1988), explained how patients cognitively process illness-related stimuli and construct a subjective interpretation of illness, treatment and hospitalization. Symptom pattern, familiarity with the situation, and congruence between the expected and the experienced in illness-related events are components of the stimuli frame which are processed by the patient. Interpretation of the stimuli frame is influenced by the information-processing abilities, or cognitive capacity of the person, along with the resources, or structure providers available to assist the person. Uncertainty can develop if the patient is unable to interpret or find meaning in the illness events.

Mishel (1988) postulated that uncertainty has four forms in the illness experience: ambiguity concerning the state of the illness; complexity regarding treatment and system of care; lack of information about the diagnosis and seriousness of the illness; and
unpredictability of the course of the disease and prognosis. When appraisal of the stimuli results in uncertainty, it may be viewed as either a danger or an opportunity, with corresponding positive or negative outcomes depending on the individual's ability to manipulate the uncertainty.

There is support in the literature for uncertainty of events as a major source of hospital related stress (Suls & Mullen, 1981; Hackett & Cassen, 1975; Davis, 1972). Examination of the relationship of perceived uncertainty to the perception of hospital events as stressful was carried out by Mishel in 1984. Findings indicated a strong relationship between uncertainty and stress, suggesting that it was the vagueness, lack of clarity and lack of information about events that accounted for their evaluation as stressful (p. 169).

In serious illness, events may be evaluated as threatening and uncertain due to the inability of the person to accurately predict the impact of the situation, especially when survival is at issue (Lazarus, 1974). This was supported by Mishel (1984), who found that those seriously ill patients who perceived uncertainty in multiple events involved in their illness, treatment and hospitalization also experienced a high level of hospital stress.

A number of studies have explored the concept of uncertainty in relation to specific patient populations such as cardiovascular patients and cancer patients. Cardiovascular patients perceived uncertainty as ambiguity about the severity of their illness and expressed fear of continuing damage to the heart and death (Mishel, 1983). Christman et al (1988) found that high levels of uncertainty were directly related to high levels of emotional distress during the transition from hospital to home and return to self-
care following myocardial infarction. Coronary artery bypass patients were found to experience uncertainty about the course of the illness, the possibility of complications and/or death, the outcomes of surgery and the experience of hospitalization (Dubyts, 1988; Simurda, 1988). Ford (1989) found moderately low levels of uncertainty in patients who had a biological cardiac valve implanted, with the most uncertainty being due to not being able to foretell the future and the unpredictability of their situations.

A study by Hilton (1988), found that uncertainty in women with breast cancer arose from such areas as "not being able to foretell the future, not feeling secure and safe from danger, being in doubt, being undecided, perceptions of vagueness, and not being able to rely or count on someone or something" (p. 217). Mishel and associates (1984) explored predictors of psychosocial adjustment in patients newly diagnosed with gynecological cancer and found that uncertainty was associated with a loss of motivation, sadness, and poor expectations about the future. This same study demonstrated that women who were more uncertain and pessimistic had more adjustment problems, and more problems with family relationships (p. 298).

Mishel and Sorenson (1991) explored the mediating functions of mastery and coping in relation to uncertainty in gynecological patients. Their findings suggested that uncertainty reduced the person’s ability to manage a situation or use personal resources, with the result that the appraisal of the situation as a danger was enhanced.

In a study by Weems and Patterson (1989), patients awaiting kidney transplant experienced pervasive uncertainty as they wondered when they would get a kidney, and indeed if they would get a kidney. Weitz (1989) found that uncertainty affects the lives
of persons with AIDS in the following ways: wondering whether they will get the
disease; uncertainty in interpreting and responding to the symptoms; unpredictable flare-
ups and remissions; and anxiety about living and dying with dignity. In this study, links
are suggested among uncertainty, loss of control and stress, with the implication that
people can handle stressful situations more effectively if they have a sense of control over
the situation.

There is a paucity of documentation in the literature in relation to uncertainty in
pregnancy. Galloway (1976) provided anecdotal information about the uncertainty and
stress of high-risk pregnancy without empirical evidence, and described emotional
reactions such as; shock; anxiety about outcome of the pregnancy and the health of the
mother and unborn child; worry about the normality of the baby; and, fear of birth
complications and death. Although suggestions for nursing interventions are given, there
is no evidence of empirical testing of the concepts presented.

Sorenson (1990) utilized the theoretical model of uncertainty proposed by Mishel
(1984) to describe the antecedents of uncertainty in pregnancy, with examples obtained
from qualitative interviews with pregnant women. The author suggested that the
significance of uncertainty surrounding pregnancy-related changes is that it triggers a need
to make sense of the situation, to determine the meaning of the change for one’s life.
Sorenson also suggested a correlation between maternal stress levels and fetal and
pregnancy complications, but the study design and sample was not described and no
explicit evidence of this relationship was documented. However, this view is supported
by Lederman (1984, 1986), whose comprehensive review of the literature identified a
variety of maternal and fetal complications that may be related to maternal stress.

In summary, the concept of uncertainty in relation to the model of cognitive
appraisal has been studied with respect to the theory of stress and coping. Uncertainty in
illness and hospitalization has been addressed by a number of researchers with a variety of
patient populations. Although one author has related uncertainty theory to pregnancy, no
literature has been found which describes this concept in women hospitalized with high-
risk pregnancy.

Factors Influencing Uncertainty

Because pregnancy is a time-dominated physiological process, there is a definite
timed sequence of events that is progressive and predictable. Following the expected
trajectory, pregnancy has a definite duration and shape with certain sign-posts such as
quickening and uterine enlargement which are anticipated by the woman and her family.
The trajectory itself is a major determinant of the behaviour of all those involved with the
pregnant woman, including health care professionals (Snyder, 1979). When the trajectory
is altered and no longer predictable, as in high-risk pregnancy, time takes on a new
meaning.

Mishel (1990), in a reconceptualization of the uncertainty in illness theory,
suggested that the original theory did not address the issue of temporal variability, or how
illness-related phenomena evolve over time. Although appraisal occurs continuously and
it is reasonable that perceptions will change, the uncertainty theory itself does not account
for the appraisal of uncertainty over time. Mishel suggested that the disruptive uncertainty
of the early phase of illness may become the foundation for an individual’s new sense of order or view of life as opportunity rather than danger. This view of uncertainty remains theoretical without empirical support.

Carty, Crawford & Ross (1990) found that high-risk antepartum women described the hospitalization portion of the trajectory as a roller coaster ride, with unpredictable periods of stability and instability. However, this qualitative study did not investigate the relationship of length of stay to the perceived experience of these women. White and Ritchie (1984) found that women who had been in hospital for 2 weeks or longer had increased stress, based on the Antepartum Hospital Stressors Inventory. Merkatz (1976) supported these findings with 7 out of 8 hospitalized women demonstrating a significant increase in behaviours reflecting stress after two weeks in hospital. In addition, a study of predictors of adaptation in women hospitalized during pregnancy, by Ford and Hodnett (1990), suggested that the hospitalized woman’s level of adaptation may decrease as hospitalization progresses. None of these studies, however, have provided any evidence of a relationship between length of hospitalization and uncertainty.

White and Ritchie (1984) attempted to relate selected unidentified patient characteristics and stress levels, but found insufficient evidence to support a clear association. Monahan and DeJoseph (1991), in a study of how women cope with preterm labour, found an inverse association between age and psychologic distress. They speculated that lower anxiety may be a result of familiarity with pregnancy and birth among older gravidas with increased parity (p. 17). They also found a negative
correlation between anxiety and length of time on bedrest, but not between anxiety and

In summary, there is very little in the literature concerning high-risk pregnancy
that relates to the association of factors such as length of hospital stay, parity, maternal
age and gestational age, and no studies were found that relate these factors to uncertainty.

**Summary of the Literature Review**

The review of the literature has shown that a limited number of researchers have
investigated the dynamics of high-risk pregnancy. High-risk pregnancy is often described
in the literature in relation to the normal developmental tasks of pregnancy.
Hospitalization has been viewed as a stressful experience but uncertainty has only been
alluded to.

The uncertainty literature has revealed study of this concept in relation to illness,
stress and hospitalization, and the theories have been empirically tested on a variety of
patient populations. However, no studies have been found which examine the uncertainty
experienced by women hospitalized with high-risk pregnancies, and factors such as length
of stay, parity, maternal age and gestational age have not been investigated.
CHAPTER THREE

Methods

Introduction

This section describes the research design of this study, sample selection, data collection procedure, instruments for data collection, data analysis procedures and procedures for protection of human rights.

Research Design

A descriptive correlational design was used in this study. A design of this type allows the researcher to assess the extent to which levels of one phenomenon correspond to levels of another (Woods & Catanzaro, 1988, p. 124).

Sample

The sample consisted of 58 hospitalized antepartum women selected through convenience sampling. This sample size is sufficient to test a correlation of \( r = 0.30 \) based on a power of 0.80, medium effect size of 0.30 and a significance level of 0.05, using a two-tailed test (Cohen, 1977).

Subjects selected for inclusion in the study met the following criteria:

1. The woman was hospitalized for the first time with this high-risk pregnancy condition.
2. The minimum maternal age was 20 years.
3. The gestational age of the pregnancy was 20 weeks or older.
4. The woman was married to or was living with the father of the baby.
5. She was able to read and communicate in English.
Data Collection Procedure

Participants for this study were obtained from the antepartum units of Grace Hospital in Vancouver. Nursing staff were asked to assist in identifying women who met the study criteria. A coded introductory letter describing the study (Appendix A) was presented to the patient on the second day in hospital, by the patient's primary nurse. If the patient indicated that she was willing to participate by checking the appropriate box on the introductory letter, the primary nurse informed the researcher. The researcher then took the two identical questionnaires labelled Time 1 and Time 2 (Appendix B), the Patient Information Sheet (Appendix E) and the letter explaining consent (Appendix C) to the patient. The patient was asked to complete the first questionnaire (Time 1) and return it in a sealed, coded envelope to a designated place on the unit. The patient was also asked to complete the second questionnaire just prior to hospital discharge (Time 2), and return it in the same way. The patient's physician was informed of her participation in this study (Appendix D) through a letter placed on the front of the patient's chart.

Instruments for Data Collection

Two instruments for data collection were utilized in this study. The Uncertainty Stress Scale - High-Risk Pregnancy Version (USS-HRPV) (Appendix B), adapted from the Uncertainty Stress Scale (USS) developed by Hilton, was used to measure perceived uncertainty. A Patient Information Sheet was utilized to collect demographic information.

Uncertainty Stress Scale (USS)

The Uncertainty Stress Scale (Hilton, 1991) consists of three parts which measure the degree and stress of uncertainty. The first part consists of 60 items and asks
participants how they judge their degree of uncertainty about a number of areas related to their health condition. It uses a five point scale with 1 indicating "no uncertainty" and 5 indicating "a great deal of uncertainty". The second part of the scale asks participants the degree of stress they feel related to the uncertainty identified for each of the same 60 items. This is the only instrument that exists to date that measures the degree of stress generated by uncertainty. The third part is a set of four visual analogue scales which measure global uncertainty about the health condition and the stress, threat and opportunity generated from the uncertainty.

The development of the USS was based on Hilton's (1988) phenomenological study of women coping with breast cancer, as well as a theoretical and empirical review of the literature. From the phenomenological research, areas of uncertainty included: not being able to foretell the future; not feeling secure and safe from danger; being in doubt; being undecided; perceptions of vagueness; and not being able to rely or count on someone or something. The original version consisted of 55 items which were tested for content validity by experts and then were pilot tested on 300 cancer patients. Factor analysis indicated 8 factors which were refined to 4 stronger subscales each with at least 10 items. Internal consistency alpha coefficients ranged from .50 to .74 (Hilton, 1991).

Results of the pilot study suggested further refinement of some items was necessary and that the scale might be useful for individuals with a variety of other disorders. Subsequently, the scale was given to people with cardiac, vascular and kidney disorders and they were also interviewed for the appropriateness of the items. Relevant literature was also reviewed. It was concluded that the scale would be appropriate for
people with other disorders. A revised scale (Version 2) which consisted of 48 items was tested with 200 cancer patients, 94 kidney transplant patients, 120 vascular patients and 10 cardiac patients. This version measured four aspects of uncertainty: lack of clarity in interpretation and understanding of the situation (12 items); not being able to foretell the future in terms of symptoms and outcomes (13 items); dependability/reliability (11 items); and being inclined to disbelief, doubts about choices, treatments, strategies and behaviours (12 items).

Ford (1989) used Version 2 in a study of "Uncertainty Over Time and Its Relationship to Life Satisfaction for Biological Valve Patients". Internal consistency reliability of the total scale was .92 in this study, and each of the factors had alpha coefficients which ranged from .67 to .81, indicating good internal consistency.

In order to address concern about some difficulty interpreting items with the Likert format, further revision was undertaken. The most recent version, consisting of 60 items, was tested on a group of cancer patients. Factor analysis followed by orthogonal (Varimax) rotation resulted in a five-factor solution, which accounted for 30% of the variance. The resulting five areas of uncertainty which Hilton was able to describe were: Indefiniteness (not being clearly defined or precise-20 items); Reliability/Dependability (not being able to trust in achievement, accuracy or honesty-17 items); Probability (likelihood of chance of something happening or being true-8 items); Doubtful (holding questionable, distrusting, hesitating to believe, being undecided in opinion or belief-7 items); and Indeterminateness (not being fixed or clear, being unsettled-8 items). Each of the five factors had internal consistencies ranging from .78 to .95, indicating good
homogeneity. Swanson (1991) used Version 3 with renal transplant patients and obtained an internal consistency reliability alpha of .96.

Continuing validation studies are being conducted on the USS. Convergent validity has been confirmed with subjects’ responses to Version 2 and the Mishel Uncertainty in Illness Scale (Community Version) (Mishel, 1983) resulting in a correlation of .64. Construct validity was tested using contrasted groups of women with recurrence or no recurrence of breast cancer, and resulted in a significant difference in level of uncertainty (Hilton, 1991). In addition, a prediction study is being carried out to test for construct validity.

The Uncertainty Stress Scale - High-Risk Pregnancy Version (USS-HRPV) was adapted from the USS (Version 3) in consultation with Hilton. In reviewing the literature related to uncertainties during high-risk pregnancy, the USS was revised to a 56 item questionnaire, and included items relating to the unborn fetus. The stress portion of the tool was also revised from a 5 point scale to a 3 point scale, ranging from "no stress" to "a great deal of stress". Internal consistency of the USS-HRPV for this present study was 0.96 for the whole scale.

Patient Information Sheet

The patient information sheet to be used in this study was designed to collect relevant demographic and health related data from each subject (Appendix E). Items included information about the subject’s age, level of education, occupation, parity, obstetrical history and history of present pregnancy.
Data Analysis

Raw data from the questionnaires were coded, entered into a computer file and analyzed using the Statistical Program for the Social Sciences (SPSSX). Descriptive and parametric statistics were used to analyze the data. Descriptive statistics provided a method of describing the characteristics of the sample and the variability of responses to research questions one and two. Paired t tests were used to assess the differences between the perceived levels of uncertainty at 48 hours after admission (Time 1) and at the time of discharge (Time 2) (research question three). T tests were also used to assess the differences between group means of the primiparas and the multiparas (research question four). Pearson's Product Moment Correlation test was used to determine the relationship between uncertainty and length of hospital stay (research question five), the relationship between uncertainty and maternal age (research question six) and the relationship between uncertainty and gestational age (research question seven). The Pearson r can be used to test hypotheses concerning relationships in the population when variables are assumed to be at least of the interval level of measurement (Woods & Catanzaro, 1988).

The level of significance for this study was 0.05.

Ethics and Human Rights

This study protected the human rights of the subjects involved and was conducted in an ethical manner. Prior to conducting the study, permission was obtained from the University of British Columbia Behavioural Sciences Screening Committee for Research and Other Studies Involving Human Subjects. Permission was also obtained from the
Salvation Army Grace Hospital Research Coordinating Committee to utilize hospital resources for research purposes and to solicit subjects for the study.

All of the potential participants received an introductory letter outlining the purpose of the study and the nature of their participation, as well as a statement indicating that completion of the questionnaires indicated consent to participate. The researcher's name and telephone number was included in the introductory letter, encouraging participants to call if they had any questions or concerns about the study. Confidentiality was maintained throughout the study. The names of the participants did not appear on the questionnaires, as each participant was assigned a code number and questionnaires were returned in sealed and coded envelopes.

All of the potential participants were informed that they could refuse to answer any questions or withdraw their participation at any time without any effect on their future medical or nursing care.

A letter was attached to the front of each patient's chart which informed the physician of the subject's consent to participate in the study.
CHAPTER FOUR
Presentation and Discussion of Results

Introduction

This chapter consists of three sections. The first section provides a description of the characteristics of the sample. The second section presents the findings and the final section provides a discussion of the results.

Characteristics of the Sample

The sample consisted of 58 hospitalized antepartum women who completed a questionnaire at two different times during their hospitalization. A total of 112 patients were approached by the researcher to consider participation in the study. Of the 26 patients who preferred not to participate, 10 declined due to imminent discharge and 16 declined for unknown reasons. Of the 86 patients who agreed to participate, 43 completed the questionnaire both at 48 hours after admission and at time of discharge, for a response rate of 50%. Fifteen women completed the first questionnaire only, at 48 hours after admission. Among the reasons for non-completion of the second questionnaire, 12 were due to unexpected delivery, two were transferred to another hospital and one was due to death of the baby. Of the 28 women who did not complete either questionnaire, nine were due to unexpected delivery, one was due to intrauterine death of the fetus, and 18 were for unknown reasons.

The sample will be discussed in terms of its demographic characteristics, pregnancy-related characteristics, health status and length of stay in hospital.
Demographic Characteristics of the Sample

Demographic data collected from the subjects were age and educational level. Age of the subjects ranged from 21 to 39 years ($M=30.3$, $SD=4.4$) (see Table I).

Table I

Age Distribution for Sample

<table>
<thead>
<tr>
<th>Age</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>20-25</td>
<td>9</td>
<td>15.5</td>
</tr>
<tr>
<td>26-30</td>
<td>20</td>
<td>34.5</td>
</tr>
<tr>
<td>31-35</td>
<td>23</td>
<td>39.7</td>
</tr>
<tr>
<td>36-40</td>
<td>6</td>
<td>10.3</td>
</tr>
<tr>
<td>Total</td>
<td>58</td>
<td>100.0</td>
</tr>
</tbody>
</table>

The educational level of the sample is presented in Table II. The majority of the hospitalized antepartum women had either completed Grade 12 or 13 (31.0%) or had completed College or University (50.0%).

Table II

Education Level of the Sample

<table>
<thead>
<tr>
<th>Education Level</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Up to Grade 8</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Grade 9-11</td>
<td>8</td>
<td>13.8</td>
</tr>
<tr>
<td>Grade 12-13</td>
<td>18</td>
<td>31.0</td>
</tr>
<tr>
<td>College/University</td>
<td>29</td>
<td>50.0</td>
</tr>
<tr>
<td>Masters/Doctorate</td>
<td>3</td>
<td>5.2</td>
</tr>
<tr>
<td>Total</td>
<td>58</td>
<td>100.0</td>
</tr>
</tbody>
</table>
Pregnancy-related Characteristics of the Sample

Pregnancy-related data collected from the hospitalized antepartum women were: gestational age on admission, number of pregnancies, problems with current pregnancy, problems with previous pregnancies and reasons for admission to hospital.

On admission, the majority of women were greater than 30 weeks gestation (M=30.8, SD=4.4). The range of gestational age was from 21 to 38 weeks (see Table III).

Sixteen (27.6%) of the women were primigravidas, whereas 42 (72.4%) were multigravidas. Among the multigravidas, a range of two to six pregnancies was reported (see Table IV).

Table III

Gestational Age of the Sample

<table>
<thead>
<tr>
<th>Gestational Age</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>21 - 25 (weeks)</td>
<td>8</td>
<td>13.8</td>
</tr>
<tr>
<td>26 - 30</td>
<td>21</td>
<td>36.2</td>
</tr>
<tr>
<td>31 - 35</td>
<td>19</td>
<td>32.8</td>
</tr>
<tr>
<td>36 - 40</td>
<td>10</td>
<td>17.2</td>
</tr>
<tr>
<td>Total</td>
<td>58</td>
<td>100.0</td>
</tr>
</tbody>
</table>

All but two (96.5%) of the patients in the study reported having problems in the current pregnancy. The problems most frequently reported included: bleeding, spotting, placenta problems, cramps, contractions, pre-term labour, hypertension, gestational diabetes and premature rupture of membranes.
Table IV

Number of Pregnancies

<table>
<thead>
<tr>
<th>Number</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>first</td>
<td>16</td>
<td>27.6</td>
</tr>
<tr>
<td>second</td>
<td>18</td>
<td>31.0</td>
</tr>
<tr>
<td>third</td>
<td>11</td>
<td>19.0</td>
</tr>
<tr>
<td>fourth</td>
<td>8</td>
<td>13.8</td>
</tr>
<tr>
<td>fifth</td>
<td>4</td>
<td>6.9</td>
</tr>
<tr>
<td>sixth</td>
<td>1</td>
<td>1.7</td>
</tr>
<tr>
<td>Total</td>
<td>58</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Of the 42 multigravidas, 12 (20.7%) reported having no problems with other pregnancies, while 30 (51.7%) reported problems with previous pregnancies, including miscarriage, spotting, bleeding, pre-term labour, and gestational diabetes. One stillbirth and one twin pregnancy were also reported.

A total of 22 different reasons for admission to hospital were reported by the high-risk women. The most frequently reported reasons for admission were antepartum bleeding (32.8%) and preterm labour (31.3%) (see Table V). Two subjects reported long distances from a hospital as the reason for admission.
Table V

Reported Reasons for Admission

<table>
<thead>
<tr>
<th>Reason</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Antepartum Hemorrhage</td>
<td>19</td>
<td>32.8</td>
</tr>
<tr>
<td>Preterm Labour</td>
<td>18</td>
<td>31.3</td>
</tr>
<tr>
<td>Premature Rupture of Membranes</td>
<td>5</td>
<td>8.6</td>
</tr>
<tr>
<td>Hypertension</td>
<td>4</td>
<td>6.9</td>
</tr>
<tr>
<td>Oligohydramnios</td>
<td>2</td>
<td>3.4</td>
</tr>
<tr>
<td>Distance from Hospital</td>
<td>2</td>
<td>3.4</td>
</tr>
<tr>
<td>Polyhydramnios</td>
<td>1</td>
<td>1.7</td>
</tr>
<tr>
<td>Bedrest</td>
<td>1</td>
<td>1.7</td>
</tr>
<tr>
<td>Incompetent Cervix</td>
<td>1</td>
<td>1.7</td>
</tr>
<tr>
<td>Leg Spasms</td>
<td>1</td>
<td>1.7</td>
</tr>
<tr>
<td>Hip Pain</td>
<td>1</td>
<td>1.7</td>
</tr>
<tr>
<td>Asthma</td>
<td>1</td>
<td>1.7</td>
</tr>
<tr>
<td>High Uric Acid</td>
<td>1</td>
<td>1.7</td>
</tr>
<tr>
<td>Abdominal Pain</td>
<td>1</td>
<td>1.7</td>
</tr>
<tr>
<td>Total</td>
<td>58</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Health Status of the Sample

Health status data were collected from the hospitalized antepartum women. Forty-eight of the women (82.8%) reported having no other health problems, whereas 10 women (17.2%) reported having other medical or health problems. The health problems reported included: blood disorder, Crohn's disease, gastric problems, chronic urinary tract infection, systemic lupus, stroke, endometriosis, heart murmur and ex-cocaine addiction.

Length of Stay in Hospital

The length of stay for the hospitalized antepartum women ranged from 2 to 42 days (M=11.9, SD=9.9), with the majority of women (67.3%) staying more than six days (see Table VI).
Table VI

Length of Stay in Hospital

<table>
<thead>
<tr>
<th>Number of Days</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-5</td>
<td>19</td>
<td>32.7</td>
</tr>
<tr>
<td>6-10</td>
<td>17</td>
<td>29.3</td>
</tr>
<tr>
<td>11-15</td>
<td>6</td>
<td>10.3</td>
</tr>
<tr>
<td>16-20</td>
<td>4</td>
<td>6.9</td>
</tr>
<tr>
<td>21-25</td>
<td>5</td>
<td>8.5</td>
</tr>
<tr>
<td>26-30</td>
<td>2</td>
<td>3.4</td>
</tr>
<tr>
<td>31-35</td>
<td>4</td>
<td>6.8</td>
</tr>
<tr>
<td>36-40</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>41-45</td>
<td>1</td>
<td>1.7</td>
</tr>
<tr>
<td>Total</td>
<td>58</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Findings

The findings of this research will be presented in relation to each of the seven research questions. The perceived levels of uncertainty were examined using descriptive statistics. The differences between uncertainty at admission and discharge, and between levels of uncertainty for primigravidas and multigravidas were analyzed using t-tests. The relationships between uncertainty and length of hospital stay, uncertainty and maternal age and uncertainty and gestational age were analyzed using the Pearson product-moment correlation statistic.

Research Question 1: What is the perceived level of uncertainty 48 hours after admission?

To address the level and nature of uncertainty perceived by the hospitalized antepartum women 48 hours after admission (Time 1), the frequency and distribution of the uncertainty scores were examined. The total score on the Uncertainty Stress Scale-High-Risk Pregnancy Version (USS-HRPV) at Time 1 ranged from a low of 51 to a high
of 230 (M=113.9, SD=38.5) (see Table VII). The most frequently occurring score was 98.0 and the median score was 109.5. Thirty-one subjects (53.4%) scored below the mean. The majority of the sample (91.4%) had some or moderate uncertainty, and 13.8% had relatively high uncertainty.

Table VII

**Total Uncertainty for Hospitalized Antepartum Women 48 Hours after Admission**

<table>
<thead>
<tr>
<th>Total Score</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>50-70 (low uncertainty)</td>
<td>5</td>
<td>8.6</td>
</tr>
<tr>
<td>71-90</td>
<td>12</td>
<td>20.7</td>
</tr>
<tr>
<td>91-110</td>
<td>13</td>
<td>22.4</td>
</tr>
<tr>
<td>111-130</td>
<td>11</td>
<td>19.0</td>
</tr>
<tr>
<td>131-150</td>
<td>9</td>
<td>15.5</td>
</tr>
<tr>
<td>151-170</td>
<td>4</td>
<td>6.9</td>
</tr>
<tr>
<td>171-190</td>
<td>1</td>
<td>1.7</td>
</tr>
<tr>
<td>191-210</td>
<td>1</td>
<td>1.7</td>
</tr>
<tr>
<td>211-230 (high uncertainty)</td>
<td>2</td>
<td>3.5</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>58</strong></td>
<td><strong>100.0</strong></td>
</tr>
</tbody>
</table>

*Note:* 56 items scored from 1 to 5. Minimum score possible is 56 and maximum score possible is 280.

Overall level of uncertainty using the visual analogue scale was also examined at Time 1. Overall uncertainty ranged from 0 to 100, with a mean of 49.6 (SD=30.5) (see Table VIII). Twenty-two of the women (37.9%) had moderate to high overall levels of uncertainty with scores above 60.

The frequency and distribution of the five uncertainty items which elicited the most uncertainty on the USS-HRPV at Time I are presented in Table IX. Rank ordering of the highest to the lowest scores elicited on the scale at Time 1 is described in Appendix F.
Table VIII

Overall Uncertainty Level: Visual Analogue - Time 1

<table>
<thead>
<tr>
<th>Total Score</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-10 (low uncertainty)</td>
<td>6</td>
<td>10.3</td>
</tr>
<tr>
<td>11-20</td>
<td>8</td>
<td>13.8</td>
</tr>
<tr>
<td>21-30</td>
<td>4</td>
<td>6.9</td>
</tr>
<tr>
<td>31-40</td>
<td>3</td>
<td>5.2</td>
</tr>
<tr>
<td>41-50</td>
<td>12</td>
<td>20.7</td>
</tr>
<tr>
<td>51-60</td>
<td>3</td>
<td>5.2</td>
</tr>
<tr>
<td>61-70</td>
<td>5</td>
<td>8.6</td>
</tr>
<tr>
<td>71-80</td>
<td>7</td>
<td>12.1</td>
</tr>
<tr>
<td>81-90</td>
<td>4</td>
<td>6.9</td>
</tr>
<tr>
<td>91-100 (high uncertainty)</td>
<td>6</td>
<td>10.3</td>
</tr>
<tr>
<td>Total</td>
<td>58</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Note: 100 mm visual analogue scale. Minimum score possible is 0 and maximum score possible is 100.

Table IX

Frequency and Distribution of the Top Five Uncertainty Items at Time 1

<table>
<thead>
<tr>
<th>Item</th>
<th>Mean</th>
<th>Median</th>
<th>Mode</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>3. What caused my condition</td>
<td>3.26</td>
<td>3.5</td>
<td>5</td>
<td>1</td>
</tr>
<tr>
<td>15. About my baby’s chances to be healthy</td>
<td>3.19</td>
<td>3.0</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>41. How long my symptoms will last</td>
<td>3.18</td>
<td>3.0</td>
<td>5</td>
<td>3</td>
</tr>
<tr>
<td>48. About the cause of my symptoms</td>
<td>3.04</td>
<td>3.0</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>2. About the stability of my condition</td>
<td>3.00</td>
<td>3.0</td>
<td>2</td>
<td>5</td>
</tr>
</tbody>
</table>

Research Question 2: What is the perceived level of uncertainty at time of discharge?

The level and nature of uncertainty perceived by the hospitalized antepartum women at the time of discharge (Time 2) were determined by examining the frequency
and distribution of the uncertainty scores at Time 2. The total score on the Uncertainty Stress Scale-High-Risk Pregnancy Version (USS-HRPV) at Time 2 ranged from a low of 55 to a high of 187 (M=95.7, SD=35.9) (see Table X). The most frequently occurring score was 56 (n=4) and the median score was 83. Twenty-seven subjects (62.8%) scored below the mean. The majority of the sample (72.1%) had low uncertainty levels but 9.4% had relatively high levels.

Table X

<table>
<thead>
<tr>
<th>Total Score</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>50-70 (low uncertainty)</td>
<td>12</td>
<td>27.9</td>
</tr>
<tr>
<td>71-90</td>
<td>12</td>
<td>27.9</td>
</tr>
<tr>
<td>91-110</td>
<td>6</td>
<td>13.9</td>
</tr>
<tr>
<td>111-130</td>
<td>4</td>
<td>9.3</td>
</tr>
<tr>
<td>131-150</td>
<td>5</td>
<td>11.6</td>
</tr>
<tr>
<td>151-170</td>
<td>2</td>
<td>4.7</td>
</tr>
<tr>
<td>171-190 (high uncertainty)</td>
<td>2</td>
<td>4.7</td>
</tr>
<tr>
<td>Total</td>
<td>43</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Note: 56 items scored from 1 to 5. Minimum score possible is 56 and maximum score possible is 280.

Examination of the visual analogue scale revealed overall uncertainty levels at Time 2 which ranged from 0 to 100, with a mean of 36.5 (SD=30.3) (see Table XI). Eleven of the women (25.6%) had moderate to high overall levels of uncertainty with scores above 60.

The frequency and distribution of the five uncertainty items which elicited the most uncertainty on the USS-HRPV at Time 2 are presented in Table XII. Rank ordering
of the highest to the lowest scores elicited on the scale at Time 2 is described in
Appendix G.

Table XI

Overall Uncertainty Level: Visual Analogue-Time 2

<table>
<thead>
<tr>
<th>Total Score</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 - 10 (low uncertainty)</td>
<td>10</td>
<td>23.3</td>
</tr>
<tr>
<td>11 - 20</td>
<td>8</td>
<td>18.7</td>
</tr>
<tr>
<td>21 - 30</td>
<td>5</td>
<td>11.6</td>
</tr>
<tr>
<td>31 - 40</td>
<td>5</td>
<td>11.6</td>
</tr>
<tr>
<td>41 - 50</td>
<td>3</td>
<td>7.0</td>
</tr>
<tr>
<td>51 - 60</td>
<td>2</td>
<td>4.6</td>
</tr>
<tr>
<td>61 - 70</td>
<td>3</td>
<td>7.0</td>
</tr>
<tr>
<td>71 - 80</td>
<td>2</td>
<td>4.6</td>
</tr>
<tr>
<td>81 - 90</td>
<td>2</td>
<td>4.6</td>
</tr>
<tr>
<td>91 - 100 (high uncertainty)</td>
<td>3</td>
<td>7.0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>43</strong></td>
<td><strong>100.0</strong></td>
</tr>
</tbody>
</table>

**Note:** 100 mm visual analogue scale. Minimum score possible is 0 and maximum score possible is 100.

Table XII

Frequency and Distribution of the Top Five Uncertainty Items at Time 2

<table>
<thead>
<tr>
<th>Item</th>
<th>Mean</th>
<th>Median</th>
<th>Mode</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>38. About the unpredictability of my symptoms</td>
<td>2.56</td>
<td>2.0</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>41. How long my symptoms will last</td>
<td>2.51</td>
<td>2.0</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>15. About my baby's chances to be healthy</td>
<td>2.49</td>
<td>2.0</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>22. Whether my condition will return in this pregnancy</td>
<td>2.48</td>
<td>2.0</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>3. What caused my condition</td>
<td>2.40</td>
<td>2.0</td>
<td>2</td>
<td>5</td>
</tr>
</tbody>
</table>
Research Question 3: What is the difference between perceived levels of uncertainty at 48 hours after admission and at time of discharge?

The question of the difference between the levels of uncertainty at 48 hours after admission (Time 1) and at the time of discharge (Time 2) was addressed by examining the findings of the paired t-test. The paired t-test indicated that there were significantly lower levels of uncertainty at the time of discharge ($t=2.88$, $p=0.006$) for the hospitalized antepartum women.

Research Question 4: What is the difference between level of uncertainty in primigravidas and multigravidas?

The results of t-tests indicated that the difference in the mean uncertainty scores between primigravidas and multigravidas was not significant at 48 hours after admission nor at the time of discharge (see Table XIII).

Table XIII

Level of Uncertainty: Primigravidas vs. Multigravidas

<table>
<thead>
<tr>
<th>Time</th>
<th>t</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Primigravidas (n=16)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Multigravidas (n=41)</td>
<td>-0.65</td>
<td>0.52</td>
</tr>
<tr>
<td>Time 2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Primigravidas (n=11)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Multigravidas (N=31)</td>
<td>0.77</td>
<td>0.44</td>
</tr>
</tbody>
</table>
Research Question 5: What is the relationship between uncertainty and length of hospital stay?

The Pearson Product Moment Correlation Coefficient was used to quantify the relationship between uncertainty and length of hospital stay for the hospitalized antepartum women. There was a significant positive correlation ($r=.23$, $p=.04$) between uncertainty and length of stay. That is, women who stayed longer in hospital appeared to have higher levels of uncertainty.

Research Question 6: What is the relationship between uncertainty and maternal age?

The relationship between uncertainty and maternal age was examined using the Pearson Product Moment Correlation Coefficient. Although there was a negative ($r=-.18$, $p=.09$) relationship between uncertainty and maternal age, it was not statistically significant. However, this relationship demonstrated a tendency for uncertainty to decrease as age increased.

Research Question 7: What is the relationship between uncertainty and gestational age?

The Pearson Product Moment Correlation Coefficient was used to examine the relationship between uncertainty and gestational age. There was a significant negative ($r=-.27$, $p=.02$) relationship between uncertainty and gestational age. That is, women at a greater gestational age appeared to have lower levels of uncertainty.

Ancillary Findings

Other analyses were performed for the purpose of identifying relationships and differences between uncertainty and the stress of uncertainty, uncertainty and threat, and uncertainty and positive feelings (opportunity). In addition, findings are presented in
relation to uncertainty and the demographic and pregnancy-related characteristics of the sample.

**Stress of Uncertainty**

The Uncertainty Stress Scale-High-Risk Pregnancy Version (USS-HRPV) incorporates a section that assesses the stress related to the levels of uncertainty identified for each of the 56 items on the scale. The frequency and distribution of the subject's stress of uncertainty scores were examined at Time 1 and Time 2. The relationship between uncertainty and stress of uncertainty was also examined at both times, using Pearson Product Moment Correlation.

The total stress that the uncertainty elicited at Time 1 (48 hours after admission) ranged from a low of 56 to a high of 142 (M=90.1, SD=21.1) (see Table XIV). Thirty subjects (51.7%) had low levels of stress related to uncertainty with scores below the mean. However, 8.6% (n=5) had relatively high levels of stress from uncertainty with scores above 120.

At Time 2 (time of discharge), the total stress elicited by uncertainty ranged from a low of 55 to a high of 126 (M=79.9, SD=20.3) (see Table XIV). The majority of subjects or 60.5% (n=26) had scores below the mean. Only 4.6% (n=2) had relatively high levels of stress from uncertainty.

The visual analogue scale measuring the overall level of stress derived from uncertainty was also examined at Time 1 and Time 2. The range of overall stress at Time 1 ranged from 0 to 100 (M=48.4, SD=31.8), while at Time 2, overall stress ranged from 0
to 97 (M=37.2, SD=27.9) (see Table XV). Twenty-eight percent of women at Time 1 and sixteen percent at Time 2 had relatively high levels of stress with scores above 70.

Table XIV

**Total Uncertainty Stress Score for Hospitalized Antepartum Women at Time 1 and Time 2**

<table>
<thead>
<tr>
<th>Total Score</th>
<th>Time 1</th>
<th>Time 2</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Frequency</td>
<td>%</td>
</tr>
<tr>
<td>50-70 (low stress)</td>
<td>11</td>
<td>19.0</td>
</tr>
<tr>
<td>71-90</td>
<td>19</td>
<td>32.8</td>
</tr>
<tr>
<td>91-110</td>
<td>15</td>
<td>25.8</td>
</tr>
<tr>
<td>111-130</td>
<td>10</td>
<td>17.2</td>
</tr>
<tr>
<td>131-150 (high stress)</td>
<td>3</td>
<td>5.1</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>58</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Note: 56 items scored 1 to 3. Minimum score possible is 56 and maximum score possible is 174.

Table XV

**Overall Stress from Uncertainty at Time 1 and Time 2: Visual Analogues**

<table>
<thead>
<tr>
<th>Total Score</th>
<th>Time 1</th>
<th>Time 2</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Frequency</td>
<td>%</td>
</tr>
<tr>
<td>0-10 (low stress)</td>
<td>10</td>
<td>17.2</td>
</tr>
<tr>
<td>11-20</td>
<td>4</td>
<td>6.9</td>
</tr>
<tr>
<td>21-30</td>
<td>5</td>
<td>8.6</td>
</tr>
<tr>
<td>31-40</td>
<td>7</td>
<td>12.1</td>
</tr>
<tr>
<td>41-50</td>
<td>7</td>
<td>12.1</td>
</tr>
<tr>
<td>51-60</td>
<td>6</td>
<td>10.3</td>
</tr>
<tr>
<td>61-70</td>
<td>3</td>
<td>5.2</td>
</tr>
<tr>
<td>71-80</td>
<td>5</td>
<td>8.6</td>
</tr>
<tr>
<td>81-90</td>
<td>3</td>
<td>5.2</td>
</tr>
<tr>
<td>91-100 (high stress)</td>
<td>8</td>
<td>13.8</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>58</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Note: 100 mm visual analogue scale. Minimum score possible is 0 and maximum score possible is 100.
* denotes 1 missing score.
The relationship between uncertainty and the stress of uncertainty was examined using the Pearson Product Moment Correlation Coefficient. Significant positive correlations were found between uncertainty and stress at Time 1 ($r=.83$, $p=.000$) and at Time 2 ($r=.88$, $p=.000$). In addition, there was a positive correlation between uncertainty and the overall stress visual analogue at Time 1 ($r=.73$, $p=.000$) and at Time 2 ($r=.71$, $p=.000$). Thus, for this sample, the higher the uncertainty, the higher the perception of stress from the uncertainty.

**Uncertainty and Threat**

A section of the USS-HRPV assesses the threat generated from the perceived uncertainty, using a visual analogue scale. The frequency and distribution of subjects' overall threat scores were examined (see Table XVI). The range of overall threat at Time 1 was 0 to 100 ($M=41.6$, $SD=31.0$) and at Time 2 was 0 to 96 ($M=35.2$, $SD=27.0$). Twelve women (21.1%) at Time 1 and four women (9.5%) at Time 2 had scores above 70, indicating fairly high levels of threat because of their uncertainty. Uncertainty scores and overall threat scores were found to have a significant positive correlation ($r=.67$, $p=.000$ at Time 1; $r=.70$, $p=.000$ at Time 2), indicating that higher uncertainty was associated with higher perceptions of threat.

**Uncertainty and Positive Feelings**

The USS-HRPV also assessed whether uncertainty generated any positive feelings for the hospitalized antepartum women. The majority or 39 subjects (67.2%) had positive feelings because of their uncertainty 48 hours after admission and 19 subjects (44.2%) had positive feelings related to uncertainty at the time of discharge. The level of positive
feelings at Time 1 ranged from 0 to 100 (M=42.0, SD=34.5) and from 0 to 100 (M=36.4, 
SD=30.7) at Time 2 (see Table XVII). However, a large percentage of women (30.9% at 
Time 1 and 47.6% at Time 2) had no positive feelings from the uncertainty. Correlation 
between uncertainty and positive feelings from the uncertainty was weakly negative but 
not significant at Time 1 (r=-.15, p=.13). However, there was a weak but non-significant 
positive correlation (r=.09, p=.29) between uncertainty and positive feelings from the 
uncertainty at Time 2.

Table XVI

Overall Threat from Uncertainty at Time 1 and Time 2: Visual Analogues

<table>
<thead>
<tr>
<th>Total Score</th>
<th>Time 1</th>
<th></th>
<th>Time 2</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Frequency</td>
<td>%</td>
<td>Frequency</td>
<td>%</td>
</tr>
<tr>
<td>0 - 10 (low threat)</td>
<td>11</td>
<td>19.4</td>
<td>10</td>
<td>23.8</td>
</tr>
<tr>
<td>11 - 20</td>
<td>6</td>
<td>10.5</td>
<td>6</td>
<td>14.4</td>
</tr>
<tr>
<td>21 - 30</td>
<td>8</td>
<td>14.0</td>
<td>4</td>
<td>9.5</td>
</tr>
<tr>
<td>31 - 40</td>
<td>6</td>
<td>10.5</td>
<td>4</td>
<td>9.5</td>
</tr>
<tr>
<td>41 - 50</td>
<td>8</td>
<td>14.0</td>
<td>8</td>
<td>19.0</td>
</tr>
<tr>
<td>51 - 60</td>
<td>4</td>
<td>7.0</td>
<td>2</td>
<td>4.8</td>
</tr>
<tr>
<td>61 - 70</td>
<td>2</td>
<td>3.5</td>
<td>4</td>
<td>9.5</td>
</tr>
<tr>
<td>71 - 80</td>
<td>1</td>
<td>1.8</td>
<td>1</td>
<td>2.4</td>
</tr>
<tr>
<td>81 - 90</td>
<td>6</td>
<td>10.5</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>91 - 100 (high threat)</td>
<td>5</td>
<td>8.8</td>
<td>3</td>
<td>7.1</td>
</tr>
<tr>
<td>Total</td>
<td>*57</td>
<td>100.0</td>
<td>*42</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Note: 100 mm visual analogue scale. Minimum score possible is 0 and maximum score 
possible is 100. 
* denotes 1 missing score.
Table XVII

Overall Positive Feelings at Time 1 and Time 2: Visual Analogues

<table>
<thead>
<tr>
<th>Total Score</th>
<th>Time 1</th>
<th></th>
<th>Time 2</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Frequency</td>
<td>%</td>
<td>Frequency</td>
<td>%</td>
</tr>
<tr>
<td>0 - 10</td>
<td>17</td>
<td>30.9</td>
<td>20</td>
<td>48.8</td>
</tr>
<tr>
<td>11 - 20</td>
<td>1</td>
<td>1.8</td>
<td>1</td>
<td>2.4</td>
</tr>
<tr>
<td>21 - 30</td>
<td>4</td>
<td>7.5</td>
<td>1</td>
<td>2.4</td>
</tr>
<tr>
<td>31 - 40</td>
<td>1</td>
<td>1.8</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>41 - 50</td>
<td>10</td>
<td>18.2</td>
<td>3</td>
<td>7.3</td>
</tr>
<tr>
<td>51 - 60</td>
<td>3</td>
<td>5.5</td>
<td>2</td>
<td>4.9</td>
</tr>
<tr>
<td>61 - 70</td>
<td>5</td>
<td>9.1</td>
<td>1</td>
<td>2.4</td>
</tr>
<tr>
<td>71 - 80</td>
<td>7</td>
<td>12.7</td>
<td>4</td>
<td>9.8</td>
</tr>
<tr>
<td>81 - 90</td>
<td>1</td>
<td>1.8</td>
<td>4</td>
<td>9.8</td>
</tr>
<tr>
<td>91 - 100</td>
<td>6</td>
<td>10.9</td>
<td>5</td>
<td>12.2</td>
</tr>
<tr>
<td>Total</td>
<td>*55</td>
<td>100.0</td>
<td>**41</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Note: 100 mm visual analogue scale. Minimum score possible is 0 and maximum score possible is 100.
*denotes 3 missing scores
** denotes 2 missing scores

Uncertainty and Sample Characteristics

The Pearson Product Moment Correlation Coefficient was used to examine relationships between uncertainty and age and uncertainty and educational level. Although not statistically significant, there appeared to be a trend toward lower levels of uncertainty as age went up, at both Time 1 ($r=-.18, p=.08$) and Time 2 ($r=-.17, p=.13$). The only significant correlation between educational level and uncertainty was found in relation to the stress from uncertainty at the time of discharge ($r=.26, p=.04$). In other words, women with higher educational levels perceived more stress from uncertainty, but only at the time of discharge.
Discussion

The discussion of the results is organized under the following headings:
characteristics of the sample, uncertainty, relationships between uncertainty and parity,
length of hospital stay, maternal age and gestational age, and the ancillary findings. The results will be discussed in relation to the theoretical framework, other research studies and methodological problems inherent in the study.

Characteristics of the Sample

Although there are no national statistics regarding the characteristics of hospitalized antepartum women, the sample in this study did exhibit some similarity with samples described in other studies of women hospitalized with high-risk pregnancy. For this study, the mean age of women at the time of data collection was 30.3 years, with a range of 21 to 39 years. Snyder (1985) reported a mean age of 25.5 years in a phenomenological study of seven hospitalized antepartum women. Kemp and Hatmaker (1989) found a mean age of 26 years while examining stress and social support in high-risk pregnancy, and Ford and Hodnett (1990) reported a mean age of 28.9 in a study of predictors of adaptation in women hospitalized during pregnancy. Thus, although the mean age for women in this study was higher than that of other studies, the age range of 2 to 39 years is not inconsistent with reported ranges of 17 to 39 years (Ford & Hodnett, 1990) and 17 to 37 years (White & Ritchie, 1984).

The antepartum women in this study appeared to be quite highly educated, with 55.2% having completed college or university education. While Ford and Hodnett (1990) reported that 60% of the hospitalized antepartum women in their study had a college
diploma or university degree, no other studies reported educational levels of the samples. Therefore there is only limited evidence with which to determine the representativeness of this sample with respect to educational level.

With respect to gestational age at time of admission, this sample would appear to be reasonably representative. This sample had a mean gestational age of 30.8 weeks on admission. This is consistent with the findings of Snyder (1985) whose sample had a mean gestational age of 29.5 weeks, and of Ford and Hodnett (1990) whose subjects had a mean gestational age of 28.9 weeks.

No statistics were available with which to compare the subjects in this study with respect to parity. In a Canadian study investigating predictors of adaptation in low-risk and high-risk hospitalized antepartum women (Ford & Hodnett, 1990), the majority of the subjects (85%) were multiparous, but the proportion of multiparous patients who were high-risk was not reported. Thus it is difficult to establish the representativeness of the sample in terms of parity.

The current pregnancy problems and reasons for admission of the subjects in this study appear to be consistent with reasons for admission reported by other researchers. Snyder (1985) reported admitting diagnoses of premature labour, placenta previa, incompetent cervix, vaginal bleeding and multiple gestation for women in her study of the psychosocial effects of long-term antepartal hospitalization. Ford and Hodnett (1990) reported admitting diagnoses of premature rupture of membranes, premature labour, diabetes, antepartum hemorrhage, pregnancy-induced hypertension and incompetent cervix in their study of predictors of adaptation in women hospitalized during pregnancy. As
well, diagnoses of diabetes, premature labour, and twin pregnancy were among the high-risk conditions of women in a study of stress and social support in high-risk pregnancy (Kemp & Hatmaker, 1989).

Two studies were found which reported length of stay in relation to hospitalized antepartum women. Ford and Hodnett (1990) reported a mean length of stay of 10.4 days for a sample of 27 subjects and Snyder (1985) found a mean length of stay to be 47 days for a sample size of seven. As the mean length of stay in this study was 11.9 days, with a range of 2 to 42 days, this finding is not inconsistent with the limited published evidence. However, it is interesting to note that the subjects in this study had a longer average length of stay than the average of four to six days for the antepartum units in the study facility.

In summary, the study sample appeared to be reasonably representative of the population of women hospitalized in Grace Hospital with high-risk pregnancy during the data collection period. The most frequent reasons for admission of the 769 women admitted to the high-risk antepartum units during the data collection period were antepartum hemorrhage and preterm labour, which is consistent with the results found in this study. Despite the use of convenience sampling and the small sample size, the sample was drawn from the only tertiary obstetrical center in British Columbia and would appear to be consistent with high-risk conditions reported in other studies of the hospitalized high-risk antepartum population. Other demographic characteristics such as age and educational level are also consistent with reported evidence.
Uncertainty

In the discussion to follow, the perceived level of uncertainty of women hospitalized with high-risk pregnancy is discussed, and possible reasons for variability in perceived uncertainty are presented. Findings in the literature and theoretical expectations will be related to the areas of uncertainty experienced by the hospitalized antepartum women. In addition, the uncertainty instrument (USS-HRPV) is discussed in terms of reliability and difficulties inherent in its use.

This sample of women hospitalized with high-risk pregnancies perceived moderately low levels of uncertainty at 48 hours after admission, with a mean score of 113.9 using the uncertainty scale (USS-HRPV). Variability in the level of uncertainty was demonstrated by 53.4% of the subjects scoring below the mean, indicating relatively low levels of uncertainty, and 20.7% scoring above 135, indicating fairly high levels of uncertainty.

At the time of discharge, the hospitalized high-risk women perceived lower levels of uncertainty, with a mean score of 95.7 on the USS-HRPV. At this time, 62.8% of the subjects scored below the mean, indicating low uncertainty, while 20.9% perceived relatively high levels of uncertainty, with scores above 135. The difference between levels of uncertainty at 48 hours after admission and at the time of discharge was found to be significant.

There were no studies found in the literature that measured uncertainty in the general population of high-risk hospitalized antepartum women. However, Riddell (1992) used the USS-HRPV to measure perceived levels of uncertainty in antepartum women.
with gestational diabetes. Her results indicated that women with gestational diabetes perceived moderately low levels of uncertainty, with a mean score of 109.6. These women reported the most uncertainty in relation to the baby’s chances to be healthy, whether the condition will be the same with the next pregnancy, whether the condition risk’s the baby’s life, whether a check-up will show something wrong, whether treatment delays will influence the baby’s chances, and about the seriousness of the condition.

Several other researchers have used the USS to measure uncertainty in non-pregnant populations. Ford (1989) studied uncertainty in biological valve patients using the USS-Version 2. These patients perceived moderately low levels of uncertainty with a mean score of 111.7, and indicated that not being able to foretell the future generated the highest level of uncertainty. Swanson (1991) measured uncertainty with long-term kidney transplant patients using the USS-Version 3, and also found relatively low uncertainty levels, with a mean score of 103.3. These patients also indicated that not knowing the future generated high uncertainty, as well as the unpredictability of their illness.

The conceptual frameworks which underlay this study of high-risk antepartum women provided a basis for examination and interpretation of the perceived levels of uncertainty. When a high-risk condition occurs, the normal, expected trajectory of pregnancy is altered and becomes unpredictable, leading to new demands and stresses, and possibly uncertainty. When uncertainty occurs, an individual is unable to adequately categorize events because of lack of sufficient cues, cannot assign definite value to events, and is unable to predict outcomes accurately.
The moderately low levels of uncertainty in this sample may be explained by the fact that pregnancy itself presents profound changes in a woman's life, encompassing physical, cognitive, emotional and interpersonal adjustments. Even under normal pregnancy conditions these changes may be difficult to understand or explain. Symptom patterns during pregnancy are often unstable and change either on a daily basis or from one trimester to another. Thus, the addition of symptoms related to a high-risk condition may not significantly increase a woman's perception of uncertainty beyond that which is universally expected to be present. Further, although high-risk admissions are often abrupt and accompanied by frightening symptoms such as bleeding or contractions (Snyder, 1985), the meaning of these symptoms is fairly easily interpreted as requiring immediate attention. Thus, uncertainty for these women may be moderately low due to symptom patterns that are readily identified and interpreted.

Event familiarity as an antecedent of uncertainty refers to whether a situation is repetitive or involves recognizable cues. In this study, all of the women were experiencing their first hospitalization during the current pregnancy. Sixteen (27.6%) of the hospitalized antepartum women were primigravidas, and thus lacked the event familiarity of prior pregnancy experiences. Of the multigravidas, 26 women (61.9%) reported problems with previous pregnancies, many of which required hospitalization. Thus, hospitalization during pregnancy was a familiar event for some of the women and may have led to a lessened perception of uncertainty.

Another reason for the moderately low uncertainty levels may be a function of the congruence between what is expected and what is experienced. Although many of these
women would not have expected to be hospitalized with a high-risk condition, once
admitted they would expect to receive care and/or treatment appropriate to their condition.
Scores on items on the USS-HRPV relating to event congruence such as whether
treatments would eliminate the condition or whether the condition would be controlled
reflected only moderate uncertainty. In addition, the time lag of 48 hours between
admission and completion of the first questionnaire may have moderated the appraisal of
uncertainty. Several women commented to the researcher that their uncertainty was
"nothing like it was yesterday", and "you should have seen me when I came in".

The relatively low levels of uncertainty may also have been moderated by structure
providers including education level, significant others and credible authority. The
majority of the women in this study were educated beyond Grade 12, and thus may have
had a large reference base to draw upon in interpreting the meaning of their symptoms
and conditions. The fact that all of the subjects were either married or in a stable
relationship may have positively influenced their uncertainty levels, as social support
during pregnancy is described as a mediating factor in reducing the stress and anxiety that
often accompany uncertainty (Sorenson, 1990).

Credible authority refers to the degree of trust and confidence patients have in their
health care providers, and may strengthen the stimuli frame by providing information on
the causes and consequences of symptoms (Mishel, 1988). The perceived levels of
uncertainty of the women in this study may have been lowered by information and
support provided by the health care professionals encountered on admission to the
hospital. The women may have felt that they could rely on the resources and technology
available at the tertiary obstetrical facility to deal with their high-risk condition and thus mediate their uncertainty. Support for the mediating effect of credible authority was provided by very low mean uncertainty scores on the individual USS-HRPV items relating to the doctor’s abilities and whether they would be well cared for by the nurses.

Although the majority of the subjects had relatively low levels of uncertainty, 20.7% of the sample had fairly high uncertainty levels. For these women, higher levels of uncertainty may have been related to altered cognitive capacity. Cognitive capacity, or the ability to process information may be reduced by internal stimuli such as pain, discomfort, danger, and by any physiological dysfunction potent enough to distract attentional resources (Mishel, 1988). Thus, if fewer cues are processed in an attempt to focus on the most important aspects of the situation, less accurate appraisal may lead to the perception of environmental events as uncertain. Therefore, women who were admitted with pre-term labour, bleeding, premature rupture of membranes or hypertension were dealing with physiological events which impaired accurate appraisal and may have contributed to higher uncertainty.

The item which generated the greatest uncertainty at 48 hours after admission was related to concern about what caused the condition. This is consistent with a need to determine the meaning of the situation and of the changes inherent in an altered pregnancy trajectory, with accompanying loss of normal experiences related to childbearing.

The other item which generated high uncertainty was concern about the baby’s chances to be healthy. The classification of a pregnancy as high-risk brings the threat of
risk to the baby in the form of a sick or immature baby, or even of the potential loss of the baby. This source of high uncertainty was addressed by White and Ritchie (1984) in their study of psychological stressors in antepartum hospitalization, as they describe the at-risk antepartum woman as facing the dual threats of medically identified dangers and of increasing uncertainty about what is best for herself and her fetus (p. 53). Rubin (1975) also addressed maternal tasks of the last trimester and described the woman’s wish to unburden from the pregnancy as being tempered by the fear for the welfare of the child and of herself (p. 150). Thus the literature appears to support concern for the baby’s health as a legitimate source of uncertainty in relation to the high-risk antepartum women in this study.

The levels of uncertainty expressed by the antepartum women at the time of discharge from hospital were also found to be fairly low, and were significantly lower than the levels on admission. One reason for the lower levels on discharge may be that the symptom patterns had become more stable and the meaning of symptoms was more readily interpreted. Also, familiarity with events of the hospitalization would enable more accurate appraisal of environmental cues, less novelty, and consequently decreased uncertainty. For the women whose conditions were stabilized soon after admission and who remained stabilized throughout the hospital stay, congruence between what was expected and what was experienced would also contribute to lessened uncertainty. In addition, the presence of stable social support and continuing confidence in the health care providers would contribute to reducing the overall levels of uncertainty at the time of discharge.
As with the uncertainty levels at 48 hours after admission, there was variability in
the uncertainty perceived by the subjects at discharge, and some subjects perceived
moderately high uncertainty. One reason for high uncertainty on discharge may be related
to concern about symptoms continuing or recurring at home. The two items on the USS-
HRPV which generated the most uncertainty at the time of discharge were related to
concern about the unpredictability of symptoms and about how long the symptoms will
last. It would appear that inability to appraise the predictability of symptoms may lead to
ambiguity about the state of the condition and thus contribute to higher uncertainty.
Similarly, not knowing the duration, frequency or pattern of symptoms may be associated
with a sense of not being able to foretell the outcome of the pregnancy and thus may also
lead to increased uncertainty. If the subjects did not receive adequate information,
counselling or support during discharge planning, uncertainty may not have been reduced.

In addition, concern about the baby’s chances to be healthy generated moderately
high uncertainty at the time of discharge. This uncertainty about the outcome for the
baby reinforces the sense of being unable to foretell or predict the future. Thus, despite
stabilization of the high-risk condition and possible reduction or cessation of symptoms,
these women continued to experience uncertainty as they attempted to work through the
normal developmental tasks of pregnancy. As no studies have been found which have
measured uncertainty in normal pregnancy, it is difficult to differentiate the uncertainty
related to the normal developmental tasks of pregnancy from the uncertainty of high-risk
women being discharged following antepartum hospitalization.
In general, the variability of the uncertainty levels which was evident both soon after admission and at the time of discharge may be related to the roller coaster type of instability and stability experienced by women during high-risk events, as reported by Carty, Crawford and Ross (1990). In this study, women hospitalized with high-risk pregnancy conditions experienced unpredictability, altered expectations and a number of strong emotions which disrupted their lives and created a sense of loss of a normal pregnancy. These findings of Carty, Crawford and Ross appear to be congruent with the variability of uncertainty perceived by the high-risk women in this current study.

The USS-HRPV instrument used in this study had an internal consistency alpha coefficient of .96 indicating high reliability. A coefficient of 0.8 to 0.9 indicates an instrument that reflects the fine discriminations in levels of the construct being measured (Burns & Grove, 1987, p. 293), confirming the reliability of the USS-HRPV.

Several of the subjects identified difficulties with the instrument by comments written directly on the questionnaire. One subject commented that she had "nothing to worry about here in the hospital, surrounded by competent people" but that the questionnaire did not provide an opportunity to express her "uncertainty and stress in relation to her husband, children, other family members, house, enough food in the house, pets, etc.". Another woman had difficulty responding to the threat analogue, as she stated that she didn’t "feel that her uncertainty endangered her condition". One subject added a comment that she became more uncertain "after reading a hospital pamphlet on prematurity". One subject was absolutely certain about two of the items and wrote this in, perhaps reflecting a difficulty with responding to a negatively worded item. Another
woman added comments for a number of items which seemed to elaborate on how she had scored them and then added a final comment that "this baby was meant to be!". Yet another woman stated that she was "confused about judging my feelings through how uncertain I feel rather than stating how I feel directly to each item". Finally, several women commented to the researcher that they enjoyed doing the questionnaires and that it gave them something to do.

In summary, the high-risk women in this study perceived moderately low levels of uncertainty, which is consistent with other research findings in pregnant women (Riddell, 1991), and findings in other populations (Simurda, 1988; Ford, 1989; Swanson, 1991). The theory of uncertainty in illness in conjunction with the concept of an altered trajectory of pregnancy for high-risk antepartum women helped to explain possible reasons for the variability in uncertainty levels and the unpredictability of outcomes expressed by these women.

**Uncertainty and Parity**

This study revealed that there was no significant difference between uncertainty and parity in the overall analysis of the sample. Although the mean uncertainty score for primigravida (M= 108.2) was slightly lower than that of the multigravida (M=115.7) at Time 1, the primigravida scored slightly higher M=103.0) than the multigravida (M= 93.2) at Time 2. However, neither difference was statistically significant. One reason for the apparent similarity of uncertainty scores for both primigravida and multigravida is that symptom patterns not only vary within a pregnancy, but also from one pregnancy to the next. Because every pregnancy is different, the multigravida cannot
count on experiencing the same symptoms in each pregnancy. Consequently, she has to
determine what is normal and what is happening with each new pregnancy. The greater
experience of multigravidas in determining symptom patterns may partially contribute to a
lower uncertainty level at the time of discharge.

For the 26 women in this study whose previous pregnancy(ies) was associated with
a high-risk condition (61.9% of the multigravidas), unresolved feelings or uncertainties
surrounding past experiences may have influenced the perception of uncertainty in the
present pregnancy. In other words, if a previous pregnancy did not proceed as expected, a
woman may be afraid to expect a normal pregnancy and outcome the next time and may
be worried about making the right decisions (Sorenson, 1990). Also, mothers who have
had a previous pregnancy with a bad outcome may tend to describe the current pregnancy
in negative terms (Snyder, 1985). Thus, incongruence between the expected and past
experiences may lead to uncertainty and doubt about being able to plan well enough for
future situations, and result in multigravidas perceiving slightly higher levels of
uncertainty on admission to hospital.

Uncertainty and Length of Hospital Stay

In the overall analysis of this sample, there were significant positive relationships
found between perceived levels of uncertainty and length of hospital stay, and between the
stress from uncertainty and length of stay. In other words, the longer the stay in hospital
the greater the uncertainty and the greater the stress generated by the uncertainty.

One possible reason for the lower uncertainty levels in women whose hospital stay
is fairly short is that these women may use some denial in their initial efforts to deal with
the crisis of the hospital admission, and may not be able to face the reality of the at-risk pregnancy (Ford & Hodnett, 1990). However, as the length of hospitalization increases, there is greater likelihood that the woman will have to face that reality and attempt to establish other mechanisms for dealing with the accompanying uncertainty and stress. Ford and Hodnett’s (1990) study of predictors of adaptation in women hospitalized during pregnancy revealed that there may be a period of poor adaptation around the time of admission, followed by a period of relative calm and adjustment at about seven to eight days, and then a gradual decrease in adaptation as hospitalization progresses (p. 46).

Another reason for the increase in uncertainty as hospitalization progresses may be that over time in the hospital the woman is exposed to many other patients who are experiencing their own high-risk situations. This constant contact with the stress and uncertainty of others may have an effect on the woman’s own feelings of uncertainty. As an example, one subject describing herself as a "long-term patient" stated:

The first two weeks in hospital are the most traumatic. After that things seem to settle in. After a month in a single room, I was moved to a double room with a 'one week' patient who was going through the tears and frustration of being here. After two days, she left and another 'first weeker' took her place with the tears and the "I can't take it anymore". It is extremely hard for a person who is long term to deal with this type of scenario."

In addition there is some evidence in the literature to suggest that antepartum women experience intense stress in relation to being separated from family and home (White & Ritchie, 1984), and that hospitalization of a mother tends to throw the entire family unit into disequilibrium (Merkatz, 1978). Mercer et al (1988) suggested that stressors during pregnancy such as obstetric risks and unanticipated events reduce the predictability of the outcomes for both mother and infant and have the potential to
increase anxiety and depression to the extent that interpersonal and family relationships are affected. Thus, it would seem reasonable that stress from uncertainty might increase with prolonged hospitalization.

**Uncertainty and Maternal Age**

An inverse relationship was found between uncertainty and the age of women hospitalized with high-risk pregnancies. Although not statistically significant (r=-.18, p=.09), the evidence suggests a trend toward uncertainty decreasing as maternal age increases. Age as a variable has been found to have a significant inverse relationship to stress in research with hospitalized medical patients (Volicer at al, 1977), with younger patients reporting higher levels of hospital stress than older patients. Mishel (1984) demonstrated a strong inverse relationship between age and stress, but only a slight tendency for younger patients to experience more uncertainty. It was reported that younger patients perceived more uncertainty in hospital events because they lacked an experiential frame of reference (Mishel, 1984, p. 164). Although no studies have been found which relate age in antepartum patients to stress or uncertainty, it may be suggested that a younger woman’s limited prior experience with hospital events may accentuate uncertainty and influence stress. Further investigation of the nature of the relationship between age and uncertainty in high-risk antepartum women would be useful.

**Uncertainty and Gestational Age**

In this study of hospitalized antepartum women, a significant negative relationship was found between uncertainty and gestational age. That is, women at a greater gestational age appeared to have lower levels of uncertainty. This finding is similar to
that of Riddell (1992), who also found a significant inverse relationship between uncertainty and gestational age in a sample of women with gestational diabetes. No other studies have been found which have examined this relationship in pregnant women.

Further investigation of this result was done using t-tests to explore differences between women of earlier gestational age (20 to 28 weeks) and women of later gestational age (28.1 weeks to 40 weeks). The uncertainty levels of the women of earlier gestational age (M=129.3) were found to be significantly higher (t=2.20, p=.032) than the uncertainty levels of women of later gestational age (M=106.4). In addition the mean uncertainty score of the women of earlier gestational age (M=129.3) was considerably higher than the mean uncertainty score for the entire sample (M=113.9). The women of earlier gestational age also tended to perceive more stress from their uncertainty than did women of later gestational age, although this was not found to be statistically significant (t=1.88, p=.06). These results are comparable to those of Riddell (1992), who found the highest uncertainty levels in women with gestational diabetes who were between 20 and 29 weeks gestation.

Snyder (1985) reported that women experiencing long-term hospitalization during pregnancy attempted to identify the condition of the fetus at various points in order to revamp and make meaning out of the altered trajectory of their high-risk pregnancy. Looking for babies in special care nurseries of comparable gestation to their own fetus in order to determine if their own baby would survive and focusing on old wives’ tales such as "seven month babies do better than eight babies" were tactics employed to redefine pregnancy trajectories. It would seem reasonable that women of earlier gestational age,
whose fetuses would be at greater risk, might perceive greater uncertainty and stress as they attempted to attach meaning to their pregnancy trajectories.

The maternal task of seeking safe passage for self and baby (Rubin, 1975) is realized in the second trimester of pregnancy as the woman becomes aware of the child within, attaches value to the child and begins to be protective of the unseen child. Yet the high-risk antepartum woman must face the problems that threaten her pregnancy and may be uncertain whether she will be a mother at all (Penticuff, 1982). However, after 28 weeks, deliverance becomes less of a threat to the baby and indeed may be seen as hopeful or even helpful in removing the threat. Thus, women may feel less uncertain about safe passage for themselves and their babies at later gestational ages.

**Discussion of Ancillary Findings**

In the following discussion, findings in addition to the seven research questions related to uncertainty will be presented. These findings will be discussed under the headings of stress of uncertainty and feelings generated by uncertainty.

**Stress of Uncertainty**

The high-risk antepartum women in this study perceived moderately low levels of stress related to uncertainty (M= 90.1 at Time 1; M=79.9 at Time 2). However, some expressed relatively high stress from uncertainty at both times. As these findings reflect only two slices in time of the hospital experience, the stable/unstable nature of the women's conditions may not be adequately represented. Riddell (1992) also noted a moderately low level of stress from uncertainty in gestational diabetics, using the USS-HRPV, though these women were not hospitalized.
Studies using other versions of the Uncertainty Stress Scale (USS) have reported moderately low levels of stress from uncertainty in kidney transplant patients (Swanson, 1991) and in biological cardiac valve patients (Ford, 1989). Mishel (1981) suggested that signs of stress are an indicant that a person is unable to resolve uncertainty in a situation, and that uncertainty was a significant predictor of stress for medical patients (Mishel, 1984). Mishel found a strong relationship between uncertainty and stress and proposed that vagueness, lack of clarity and lack of information about an event accounted for the event being perceived to be stressful, rather than the event itself (1984).

Findings in this study revealed that a significant positive relationship existed between stress and uncertainty ($r=.84$, $p=.000$) during hospitalization for high-risk pregnancy. This finding is not surprising since it is reasonable to expect that perceptions of stress would increase as levels of uncertainty increased. In addition, the findings revealed that women with higher educational levels perceived more stress from uncertainty ($r=.26$, $p=.04$), but only at the time of discharge. Although Volicer (1977) did not find a significant relationship between education and stress in medical-surgical patients, perhaps the antepartum women with higher educational levels in this present study read more into their symptoms and thus perceived more stress in relation to the uncertainty about whether the symptoms would reoccur after discharge.

Several studies have addressed stress during high-risk antepartum hospitalization and are included for comparison although stress in relation to uncertainty was not quantified. White and Ritchie (1984) developed an Antepartum Hospital Stressors Inventory to identify stressors such as separation from home and family, disturbing
emotions, changes in family circumstances, health concerns and changing self-image.

They implied that hospitalization could interfere with a woman's ability to complete tasks which enable her to adapt to the normal stress of pregnancy, and that increased stress would be expected as time in hospital increased. The physiological stress response in high-risk pregnancy and low-risk pregnancy was compared by Kemp and Hatmaker (1989), with reported findings of greater physiological stress in women with high-risk pregnancy. Finally, Mercer et al (1988) found relationships between stressful life events during pregnancy and diminished family functioning, and associated antepartum stress with anxiety and depression in high-risk women and their partners.

**Feelings Generated by Uncertainty**

The theoretical framework of the uncertainty and stress model devised by Mishel (1988) suggests that uncertainty results from cognitive appraisal of an event in order to determine if the event is stressful or innocuous. The process of cognitive appraisal may result in the event being perceived as stressful or lacking in meaning, and may involve harm/loss, threat or challenge/opportunity. Threat may concern harms or losses that are anticipated to have negative implications for the future. Conversely, challenge or opportunity may concern positive views of future possibilities.

The high-risk antepartum women in this study had overall moderate levels of threat because of their uncertainty with mean scores of 41.6 on admission and 35.2 at time of discharge. It is possible that the threat related to uncertainty on admission was related to ambiguous stimuli, lack of clarity of events, elevated anxiety and thus association of events with a negative outcome. The threat may have been mediated during the hospital
stay by support and information from significant others and health care personnel, enabling the women to view their situations as less dangerous and threatening at the time of discharge. In addition, uncertainty had a strong positive relationship with threat on admission to hospital \( r = .67, p = .000 \) and at time of discharge \( (r = .69, p = .000) \). Some women in this study \( (21.1\%) \) expressed fairly high levels of threat in relation to uncertainty, which may reflect the stable/unstable nature of some of the high-risk conditions necessitating hospitalization.

The findings of this study may be compared to Riddell's (1992) findings of a mean score of 42.5 for threat of uncertainty in women with gestational diabetes. No other studies were found which addressed the relationship of threat and uncertainty in the pregnant population.

Perceptions of uncertainty generated positive feelings in 67.2\% of the women on admission to hospital and in 44.2\% of the women at the time of discharge. The overall level of positive feelings was moderately low \( (M = 42. \text{ at Time 1}; M = 36.4 \text{ at Time 2}) \), and many women had no positive feelings from the uncertainty at either admission or discharge. No significant relationships were found between uncertainty and positive feelings about the uncertainty at either admission or discharge. It is possible that the women who did not have any positive feelings were fearful of the course and outcome of their high-risk conditions and thus saw only danger rather than hope in their situations. Those women who did view uncertainty with positive feelings may have been forestalling perception of an absolute negative outcome, or negative certainty. It is possible that women maintain uncertainty in order to facilitate hope, or a positive view of the situation.
In the literature, positive feelings such as hope have been found to be negatively associated with uncertainty (Mishel et al, 1984) and positive emotions have been associated with certainty (Hilton, 1988).

In summary, the ancillary findings contribute additional information regarding the level and nature of uncertainty in women hospitalized with high-risk pregnancies.

Summary

The characteristics of the sample, the findings related to each of the seven research questions and a discussion of the results have been presented in this chapter.

The sample was comprised of 58 antepartum women hospitalized with high-risk pregnancy conditions who voluntarily participated in the study. The age of the subjects ranged from 21 to 39 years and 81% had at least a Grade 12 education. The average gestational age at time of admission was 30.8 weeks. The majority (72.4%) were multigravidas and all but two of the subjects reported having problems with the current pregnancy prior to admission. Fifty percent of the multigravidas had experienced problems with previous pregnancies. Only 17.2% of the subjects reported other health problems. The average length of stay was 11.9 days, with a range of 2 to 42 days.

The response rate of 50% was reasonably good, but it is unknown whether non-responders differed in any significant ways from responders. The sample appeared to be reasonably representative of the population of women hospitalized with high-risk pregnancies reported in the literature, although they stayed in hospital longer.

Overall, the women in this study perceived moderately low levels of uncertainty soon after admission to the high-risk antepartum units as measured by the Uncertainty
Stress Scale-High-Risk Pregnancy Version (USS-HRPV). At the time of discharge, the levels of uncertainty were significantly lower than on admission. However, there was variability in the levels of uncertainty which may be attributed to the altered trajectory of pregnancy which results with high-risk conditions. The greatest uncertainty on admission was generated from concern about what caused the condition and about the baby’s chances to be healthy, whereas at the time of discharge, the greatest uncertainty arose from concern about the unpredictability of symptoms, how long the symptoms would last, and the baby’s chances to be healthy. These women appeared to experience unpredictability and altered expectations along with a sense of loss of a normal pregnancy.

No significant difference was found between uncertainty and parity. Uncertainty was found to be greater as the length of hospital stay increased, but uncertainty tended to decrease with maternal age. Women of greater gestational age were found to have less uncertainty. Significant positive relationships were found between uncertainty and stress and between uncertainty and threat, reflecting the unpredictable and often unstable nature of high-risk pregnancy conditions. Generally, the women reported low levels of positive feelings, or hope in relation to their uncertainty.

The results of the study were generally consistent with other studies in the literature. The findings were discussed in relation to the theoretical frameworks, other research studies and methodological problems inherent in the study.
CHAPTER FIVE

Summary, Conclusions, Implications and Recommendations

Introduction

This study was designed to determine the perceived level of uncertainty of women hospitalized with high-risk pregnancy. The study investigated the perceived levels of uncertainty at 48 hours after admission and at the time of discharge, and explored the difference between perceived levels of uncertainty at these two times. In addition, the relationships between uncertainty and parity, length of hospital stay, maternal age and gestational age were investigated. This chapter will include a summary of the study, conclusions, implications for nursing practice, theory and education, and finally recommendations for future research.

Summary

A review of the literature reveals that high-risk pregnancy is associated with potential jeopardy to mother and infant, hospitalization, unpredictability, stress, anxiety and loss (Snyder, 1979; White & Ritchie, 1984; Williams, 1986; Mercer et al, 1986; Carty et al, 1990). The literature also indicates a body of knowledge concerning uncertainty and stress in illness and hospitalization (Lazarus & Folkman, 1984; Mishel, 1984; Mishel, 1988; Hilton, 1988). Several researchers have studied uncertainty experienced in medical-surgical patients (Simurda, 1988; Ford, 1989; Swanson, 1991) and one researcher has studied uncertainty in women with gestational diabetes (Riddell, 1992). However, no research has been reported which addresses the uncertainty experienced by women hospitalized with high-risk pregnancy, nor factors which may influence uncertainty such as
length of stay, parity, age and gestational age. The purpose of this study was to describe the uncertainties and certainties perceived by these women in order to address some of the gaps identified in the literature.

The conceptual framework for this study was derived from Mishel’s (1988) theory of uncertainty in illness and Snyder’s (1979) framework of an altered trajectory of high-risk pregnancy. The study framework viewed the woman with high-risk pregnancy as having an altered and perhaps uncertain trajectory which required continual appraisal in order for her to derive meaning from the experience.

This descriptive correlational study was conducted in a tertiary obstetrical hospital in Western Canada. Data were collected from a convenience sample of 58 women hospitalized with high-risk pregnancy conditions. Following agreement to be approached regarding the study, the researcher discussed the study and the subjects voluntarily participated.

All subjects completed the Uncertainty Stress Scale-High-Risk Pregnancy Version (USS-HRPV) and a patient information sheet. Descriptive and parametric statistics were utilized in the analysis of the data.

The sample was comprised of 58 women with a mean age of 30.3 years. The majority of the subjects had either completed Grade 12 or 13 (31.0%) or had completed college or university (50.0%). Sixteen (27.6%) of the women were primigravida and 42 (72.4%) were multigravida, and the majority were greater than 30 weeks gestation. Almost all of the subjects (96.5%) reported problems in the current pregnancy, and the majority of the multigravida had experienced problems with previous pregnancies. The
most frequently reported reasons for admission to hospital were pre-term labour and bleeding. Only 17.2% of the women reported having other medical or health problems. The hospitalized antepartum women in this study had an average length of stay of 11.9 days.

Overall, the women hospitalized with high-risk pregnancies perceived moderately low levels of uncertainty at 48 hours after admission (M=113.9, SD=38.5), and this level dropped significantly (p=0.006) by the time of discharge (M=95.7, SD=35.9). The nature of the uncertainty soon after admission appears to be related to not knowing the cause of the high-risk condition or the symptoms, not knowing about the stability of the condition, and to concern about the baby’s chances to be healthy. At the time of discharge, the uncertainty appears to have been generated by the unpredictability of symptoms, not knowing how long symptoms will last, not knowing whether the condition will return in this pregnancy, and also by concern for the baby’s chances to be healthy.

These findings were supported by research by Riddell (1992) who found moderately low levels of uncertainty in women with gestational diabetes. Other researchers studying uncertainty in medical-surgical patients also found moderately low levels of uncertainty (Simurda, 1988; Ford, 1989; Swanson, 1991).

There was no significant difference between the uncertainty levels of primigravidas and multigravidas either at admission or at discharge.

A significant positive relationship was found between uncertainty and length of stay (r=.23, p=.04), indicating that women who stayed in hospital longer reported higher levels of uncertainty. No significant relationship was found between maternal age and
uncertainty ($r = -0.18, p = 0.09$), but there appears to be a tendency for uncertainty to decrease as age increases.

A significant negative relationship was found between uncertainty and gestational age ($r = -0.27, p = 0.02$), indicating that women of greater gestational age appear to have lower levels of uncertainty. Women of earlier gestational age (20 to 28 weeks) had significantly higher levels of uncertainty than those of later gestational age (28.1 to 40 weeks), and also tended to perceive more stress from uncertainty.

The majority of women hospitalized with high-risk pregnancy conditions perceived relatively low levels of stress generated by their uncertainty, with mean scores of 90.1 out of a maximum of 168 soon after admission and 79.9 at the time of discharge. However, some women expressed relatively high levels of stress from uncertainty on admission and at discharge. A significant positive relationship existed between uncertainty and stress at both times ($r = 0.83, p = 0.000$ at Time 1; $r = 0.88, p = 0.000$ at Time 2). This finding would indicate that the higher the level of uncertainty the higher the subjects' overall perceptions of stress, and is consistent with other research. In addition, women with higher educational levels perceived more stress from uncertainty, but only at the time of discharge.

Similarly, the subjects appraised their uncertainty in relation to feelings of threat and reported low to moderate overall threat, with higher levels of uncertainty being associated with higher perceptions of threat ($r = 0.67, p = 0.000$ at Time 1; $r = 0.70, p = 0.000$ at Time 2). The majority of subjects perceived positive feelings because of their uncertainty
but many women had no positive feelings from uncertainty and there was no significant relationship found between uncertainty and positive feelings from uncertainty.

The theory of uncertainty in illness in conjunction with the concept of an altered trajectory of pregnancy for high-risk antepartum women were utilized to explain the nature of the perceived uncertainty and the relationship of factors such as parity, length of stay, maternal age and gestational age. Explanation of possible reasons for variability in uncertainty levels and the unpredictability of outcomes expressed by high-risk antepartum women was facilitated by the empirical work of Mishel (1988) and Snyder 1979). These conceptual frameworks have provided appropriate guidance in the interpretation of the findings of this study.

Conclusions

The results of this study cannot be generalized due to the use of convenience sampling procedures. However, the findings suggest some similarities and differences among the subjects. The findings of this study provide a basis for the following conclusions.

Overall, women hospitalized with high-risk pregnancy conditions perceive moderately low levels of uncertainty upon admission to hospital and these levels drop substantially by the time of discharge. The nature of uncertainty upon admission to the antepartum units appears to be generated by the women not knowing either the cause of their condition or symptoms, or the stability of their condition, as well as being concerned about their baby’s health status. At the time of discharge, the women’s uncertainty is
related to the unpredictability of their symptoms and condition, and continues to focus on the baby’s health.

Parity is not a significant factor in the uncertainty of hospitalized antepartum women, as both primigravidas and multigravidas perceive similar levels of uncertainty. Although maternal age does not appear to be a significant factor, there is a trend toward uncertainty decreasing as age of the women increases.

Women with longer hospital stays are more likely to perceive higher levels of uncertainty, and to express greater stress from uncertainty. Women of earlier gestational age perceive significantly higher levels of uncertainty than do those of later gestational age, and also tend to experience more stress from their uncertainty. This may be related to having their pregnancy trajectory interrupted at an earlier point, resulting in potentially greater threat to their babies.

 Generally, the high-risk antepartum women appraised their uncertainty as moderately threatening and stressful. Positive or hopeful feelings from uncertainty are not a significant factor for these women, although some have moderately low levels of positive feeling and many have no positive feelings at all.

**Implications for Nursing Practice and Theory**

The findings of this study suggest several important implications for nursing practice, theory and education. First, antepartum nurses providing care to women hospitalized with high-risk pregnancies need to gain a thorough understanding of the nature of the experience as perceived by the women themselves. An awareness of the level and nature of the uncertainty these women experience will assist the nurse to plan
appropriate interventions with the goal of reducing the uncertainty and minimizing the stress of antepartum hospitalization.

Specifically, nurses need to understand the theory of uncertainty in illness and how the antecedent variables of stimuli frame and structure providers can be manipulated to help reduce the patient's uncertainty. Nurses can assist women to understand the meaning of their symptoms and to anticipate the range of symptoms even when events are unpredictable, thus reducing ambiguity and enabling the women to feel more in control. Nurses who understand the utility of structure providers such as education, social support and credible authority will be able to assist high-risk women with the interpretation of uncertain, illness-related events.

In addition, using a holistic context which encompasses physiological, psychological, familial, societal and cultural factors to view the high-risk hospitalized antepartum woman will enable the nurse to conduct a thorough and individualized assessment of each patient's uncertainty. In this way, the uniqueness of each woman's experience, with accompanying complex and unpredictable interactions will be incorporated into her plan of care.

Providing patient education is a nursing intervention which may help reduce uncertainty that is related to lack of information or lack of clarity about events during hospitalization. Providing information supplies the patient with a larger knowledge base with which to interpret symptoms and gain meaning within the context of her experience. For example, for those women who view uncertainty as threatening and stressful, having specific information may assist them to realistically revise their pregnancy trajectory by
predicting a particular end to their experience or by identifying the condition of their fetus at various points along the trajectory. In turn, a revised view of the pregnancy trajectory may result in lower uncertainty levels.

Educational programs are also required to prepare the couple experiencing a high-risk pregnancy for labour, birth and parenthood in the same way that prenatal education is vital for couples with a normal pregnancy. The childbirth educator who has a good understanding of the uncertainties of high-risk pregnancy will be able to plan and implement learning activities which will meet the unique needs of hospitalized women and their partners. Individualized teaching or small group classes held on the antepartum unit can be adapted to each woman's needs and can be flexible in response to the stable/unstable nature of high-risk pregnancy.

Another implication for nursing practice concerns discharge planning and follow-up of women with high-risk pregnancies. As discharge, these women perceive uncertainty in relation to the unpredictability of their symptoms, how long they will last and whether the symptoms will return after discharge. Thus the nurse may reduce uncertainty on discharge by involving the patient in discharge planning regarding the potential for symptoms to recur and providing information and resources for assistance should the high-risk condition become unstable again. Perhaps the establishment of an information and support "hot-line" available 24 hours per day and manned by antepartum nurses which women could call as necessary would help to minimize the uncertainty associated with discharge.
The availability of social support is viewed as a structure provider in the uncertainty theory because it can serve to provide affirmation of beliefs about symptoms, thus increasing understanding and contributing to the formation of meaning about symptoms and illness conditions. For high-risk antepartum women in hospital, opportunities may be provided for sharing of ideas, concerns, anxieties and opinions with others experiencing similar uncertainties in the form of support groups or informal sharing meetings. These may be facilitated by nurses and social workers who have a thorough understanding of the uncertainty of high-risk pregnancy, and might provide the women with an opportunity to develop a variety of useful coping strategies.

Support from family members and significant others may be encouraged by strategies which encourage and facilitate contact with the woman’s partner, other children and with the events of family life. Flexible visiting times, provision for special meals or family celebrations, and provision of privacy as required for husband or family visits are nursing interventions that may promote effective family support and functioning.

High-risk antepartum women depend on the health care professionals within the hospital to be credible authorities and to provide information and care which will help them to make meaning out their experiences. Thus caregivers must collaborate to provide consistent information and care based on the individual patient’s needs. This is extremely important for women whose uncertainty levels may fluctuate according to the stability or instability of their conditions.

The implication of this study’s findings for nursing education is that inclusion of content relating to the concept of uncertainty would assist student nurses not only to gain
a better understanding of the experience of high-risk antepartum women but also to apply this understanding to a wide variety of patient populations.

The theoretical frameworks used in this study provided direction in explaining the nature of uncertainty and the relationships between uncertainty and parity, length of stay, maternal age and gestational age for women hospitalized with high-risk pregnancy. Use of Mishel’s (1988) theory of uncertainty and illness along with Snyder’s (1979) framework for viewing the high-risk woman holistically might enable nurses to understand the high-risk pregnancy experience and to provide consistent and comprehensive nursing interventions aimed at the reduction of uncertainty. Utilization of these theoretical frameworks may lead to their further refinement and to a broader theoretical basis for nursing practice.

**Recommendations for Future Research**

The findings of this study inspire suggestions for further research which would broaden the knowledge base specific to the hospitalized high-risk maternity patient.

As this study quantified levels of uncertainty only at admission and at discharge, the roller coaster effect of stability and instability may not have been captured. A prospective time study with more frequent measurement of uncertainty levels over the period of hospitalization would provide a more comprehensive description of the possible changes in the degree and nature of uncertainty experienced during high-risk pregnancy.

Further refinement of the Uncertainty Stress Scale-High-Risk Pregnancy Version (USS-HRPV) is needed to strengthen the validity and reliability of the tool for this population. As the levels of uncertainty perceived by the high-risk women were
moderately low, perhaps ambiguities amongst the items might be reduced with refinement. The addition of items relating to uncertainties about husband, children, other family members and home affairs would tap a source of uncertainty not presently addressed by the USS-HRPV.

Further investigation using qualitative research methods may identify other uncertainties and stresses experienced by women hospitalized with high-risk pregnancy conditions. Qualitative research methods might also elicit further information about the variables of parity, length of stay, maternal age and gestational age and might generate additional variables to be studied in relation to uncertainty.

Although uncertainty in normal pregnancy is acknowledged in the literature as a common phenomenon, no studies have been found which quantify uncertainty in normal pregnancy. Research to identify levels of uncertainty in normal pregnancy and to compare these levels with levels of uncertainty in high-risk pregnancy would add to the utility of the present findings.

The overall low levels of uncertainty found in this study along with the high uncertainty of some subjects suggest a variable impact on the women’s ability to cope with their situations. Further research is needed to examine the relationships between high-risk hospitalized antepartum women’s perceptions of uncertainty, stress, threat, the use of coping strategies and adaptational outcomes. Knowledge of these relationships would be useful for nurses who are assisting women to cope with antepartum hospitalization.
Another possible area for research would be to examine whether uncertainty in high-risk pregnancy has any effect on eventual postpartum adaptation. A comparative study of postpartum adaptation in women with normal pregnancies and women with high-risk pregnancies might reveal any difference in adaptational outcomes.

Although stress and social support in high-risk pregnancy has been examined in one study (Kemp & Hatmaker, 1989), a study of the relationships of uncertainty, stress and social support in women with high-risk pregnancy would be useful. Another potential area for research would be to explore the uncertainty and stress experienced by fathers/partners of women hospitalized with high-risk pregnancy and to study the impact on children and other family members.

It would be helpful to investigate what follow-up and counselling is received by these high-risk women upon discharge, and the adequacy of discharge planning. This might be done by a retrospective study design.

In conclusion, it is this researcher's hope that further research is conducted which will contribute to the expansion of the body of nursing knowledge about the degree and nature of uncertainty experienced by women hospitalized with high-risk pregnancy.
References


Appendix A

Introductory Letter
Dear

My name is Marion Clauson. I am a registered nurse and I am currently a student in the Master of Science in Nursing Program at the University of British Columbia. I am doing a research study on how women who are hospitalized with high-risk pregnancies view the uncertainties and certainties in their situation. I am also interested in how uncertainty may be related to length of hospital stay, maternal age, age of the pregnancy, and whether this is a first pregnancy or not.

In order to do this study, women such as yourself who have been hospitalized because of a pregnancy complication are being invited to participate in the study. Your participation is very valuable and your involvement in the study would consist of responding to each question on a questionnaire at two different times during your stay. The first time would be on your second day in hospital and the second time would be just before your discharge. The time required to complete the questionnaire is approximately 15 minutes, so the total time would be about 30 minutes.

You will not be identified in any way with the information obtained on the questionnaire, as the information is identified by code number and no names are used. The information that you provide will only be shared with my thesis committee and myself. Your medical and nursing care will not be affected in any way should you decide not to complete the questionnaire.

The findings of this study will help us to understand the experience of women hospitalized with high-risk pregnancies, and to provide better nursing care in the future.

If you are interested in participating in this study, please tick in the box below and return this letter to the nursing station or to your nurse.

☐ Yes, I am willing to allow you to bring me a questionnaire.
☐ No, I would prefer not to participate in the study.

Thank you for considering this request.

Yours sincerely,

Marion Clauson, RN, BSN
MSN Student, UBC School of Nursing
980-4138

Elaine Carty
Associate Professor
UBC School of Nursing
822-7444
Appendix B

Uncertainty Scale - High-Risk Pregnancy Version
UNCERTAINTY STRESS SCALE
HIGH-RISK PREGNANCY VERSION

Please read the following statements. To the right of each statement you will see five columns labelled from 1 - No uncertainty to 5 - A great deal of uncertainty. Circle the number that most closely measures how you feel now about your uncertainties related to your high-risk condition.

To the far right of each statement you will find three more columns of numbers. Circle the number in the column that most closely reflects the degree of stress you feel related to the uncertainty you identified.

Please respond to every statement. There are no "right" or "wrong" answers. If any question does not apply, and there is no uncertainty about it, please circle "No uncertainty".

I am uncertain:

1. whether changes in my condition will be detected early ........... 1 2 3 4 5 1 2 3
2. about the stability of my condition ................................... 1 2 3 4 5 1 2 3
3. what caused my condition ................................................... 1 2 3 4 5 1 2 3
4. whether I will be able to maintain my present level of functioning .. 1 2 3 4 5 1 2 3
5. about the present state of my condition .............................. 1 2 3 4 5 1 2 3
6. what questions to ask my doctors about my condition .............. 1 2 3 4 5 1 2 3
7. whether changing my lifestyle behaviours will help my condition (e.g. diet, activity, smoking, etc.) ......................... 1 2 3 4 5 1 2 3
8. how to make sense of what I am told about my condition .......... 1 2 3 4 5 1 2 3
9. about the effectiveness of my treatments ............................ 1 2 3 4 5 1 2 3
10. whether my condition is under control ................................. 1 2 3 4 5 1 2 3
11. whether my condition will cause me to have symptoms .......... 1 2 3 4 5 1 2 3
12. what to say to others about my condition ........................... 1 2 3 4 5 1 2 3
13. about differing explanations I have been given .................. 1 2 3 4 5 1 2 3
14. about my chances to be well during this pregnancy ............... 1 2 3 4 5 1 2 3
15. about my baby's chances to be healthy ............................... 1 2 3 4 5 1 2 3
16. whether my condition will be the same with the next pregnancy ... 1 2 3 4 5 1 2 3
17. whether my symptoms can be controlled .............................. 1 2 3 4 5 1 2 3
18. whether my condition will interfere with my ability to do my regular activities .......................... 1 2 3 4 5 1 2 3
I am uncertain:

19. about my doctors' abilities..........................  1 2 3 4 5
20. how to manage my symptoms (e.g. bleeding, contractions, etc.)........  1 2 3 4 5
21. about choices I have made regarding my treatments ..................  1 2 3 4 5
22. whether my condition will return in this pregnancy ..................  1 2 3 4 5
23. about the adequacy of the follow-up I am having .....................  1 2 3 4 5
24. about my understanding of the treatments I have received and am receiving ..................  1 2 3 4 5
25. how to approach health care workers about my care (e.g. nurses, doctors, social workers, dieticians) ..................  1 2 3 4 5
26. whether my condition risks my baby's life...........................  1 2 3 4 5
27. whether my condition risks my life ................................  1 2 3 4 5
28. whether my treatments eliminated my condition ......................  1 2 3 4 5
29. whether changes in my pregnancy from normal to high-risk affect my relationships within the family ..................  1 2 3 4 5
30. whether changes in my pregnancy from normal to high-risk affect my relationships outside my family ..................  1 2 3 4 5
31. whether my condition will affect my life goals .......................  1 2 3 4 5
32. whether what I am doing about my condition will help me ............  1 2 3 4 5
33. whether I can depend on test results as an indicator of my condition .  1 2 3 4 5
34. whether my condition will affect my sex life .........................  1 2 3 4 5
35. whether delays in treatment will influence my baby's chances ......  1 2 3 4 5
36. about the seriousness of my condition ...............................  1 2 3 4 5
37. about my ability to handle my emotions related to my condition ....  1 2 3 4 5
38. about the unpredictability of my symptoms ...........................  1 2 3 4 5
39. whether I will have difficulty coping with my condition ..........  1 2 3 4 5
40. about the quality of the information I have ..........................  1 2 3 4 5
41. how long my symptoms will last .....................................  1 2 3 4 5
42. whether I am being told the truth about my condition ...............  1 2 3 4 5
43. whether I would choose to have all the treatments recommended to me ................................  1 2 3 4 5
44. what unusual symptoms mean in terms of my condition ...............  1 2 3 4 5
I am uncertain:

45. whether they might find something wrong when I go for a check-up (e.g. ultrasound, amniocentesis) .................................. 1 2 3 4 5 1 2 3
46. whether I will be well cared for by the nurses .................................. 1 2 3 4 5 1 2 3
47. whether I will be well cared for by the health professionals other than nurses .................................. 1 2 3 4 5 1 2 3
48. about the cause of my symptoms .................................. 1 2 3 4 5 1 2 3
49. whether I can depend on people who are important to me to be there when I need them .................................. 1 2 3 4 5 1 2 3
50. whether I can get insurance .................................. 1 2 3 4 5 1 2 3
51. whether I can manage financially because of my condition ........ 1 2 3 4 5 1 2 3
52. what symptoms I should be aware of .................................. 1 2 3 4 5 1 2 3
53. about how to choose the treatments I will have .................................. 1 2 3 4 5 1 2 3
54. whether my following the treatment plan recommended to me will help .................................. 1 2 3 4 5 1 2 3
55. what to look for to check the state of my condition .................................. 1 2 3 4 5 1 2 3
56. whether treatments I will be having will eliminate the condition .................................. 1 2 3 4 5 1 2 3

The following five questions relate to levels of a particular feeling or perception. Please make a cross (x) on the line which best indicates your level right now.

1. Overall, my uncertainty level about my situation is:

   0  50  100

   No uncertainty  Very high uncertainty

2. Overall, the stress I feel from my uncertainty is:

   0  50  100

   No stress  Very high stress

3. Overall, the threat I feel from my uncertainty is:

   0  50  100

   No threat  Very high threat

Some people find that uncertainty can have positive feelings (such as hope) associated with it because of the possibility that things will work out well.

4. Do you have any positive feelings because of your uncertainty?
   Yes [ ]  No [ ]

5. If yes, the level of my positive feelings is:

   0  50  100

   No positive feelings  Very high positive feelings
Appendix C

Letter Explaining Content
LEVEL OF UNCERTAINTY PERCEIVED BY WOMEN HOSPITALIZED WITH HIGH-RISK PREGNANCY

The purpose of this study is to gather information about the uncertainties and certainties you are experiencing while hospitalized with a high-risk pregnancy. This information will help us to understand your experiences and to provide better care in the future to women who are hospitalized during pregnancy.

If you are willing to participate in this study, please fill in one of the attached questionnaires on your second day in hospital and seal it in the enclosed envelope. Please complete the second identical questionnaire just before you are discharged and seal it in the second envelope. I will collect the envelopes from the nursing station. The questionnaire will take approximately 15 minutes to complete each time. Completion of the questionnaire will mean that you have consented to participate in the study.

All information is confidential and will be used for the purposes of this study only. You will not be identified in any way with the information obtained on the questionnaire. Data are identified by code number and will be shared only with my thesis committee.

You may withdraw your participation any time you wish. If you do not wish to give information in a particular area, feel free to leave it blank. Refusal to participate will in no way affect your care while a patient on the antepartum unit.

Please call if you have any questions about this questionnaire or the purpose of this study. Your input will be valuable in helping to understand the needs of women hospitalized with high-risk pregnancies.

Thank you for your assistance.

Sincerely,

Marion Clauson,
MSN Student, UBC School of Nursing
980-4138

Elaine Carty
Associate Professor
UBC School of Nursing
822-7444
Appendix D

Letter to Physician
Marion Clauson
4657 Valley Road
North Vancouver, B.C.
V7K 2M1
980-4138

Dear Dr.

My name is Marion Clauson. I am a registered nurse and I am currently a student in the Master of Science in Nursing Program at the University of British Columbia. I am doing a research study on how women who are hospitalized with high-risk pregnancies view the uncertainties and certainties in their situation together with how uncertainty may be related to length of hospital stay, parity, maternal age and gestational age.

This letter is to inform you that your patient, Mrs./Ms. ______________ has agreed to participate in this study by completing a questionnaire at two different times during her hospital stay.

If you have any questions or concerns about the study, or your patient’s participation, please feel free to contact me at 980-4138.

Thank you.

Sincerely,

Marion Clauson, RN, BSN
Appendix E

Patient Information Sheet
1. What is your due date?
2. How many weeks pregnant are you now?
3. Is this your first pregnancy?
   □ Yes
   □ No (if no please state number of previous pregnancies)
4. Please describe any problems you are having in this pregnancies.
5. Please state the reason for your admission to hospital.
6. If this is not your first pregnancy, did you have any problems with your other pregnancy(ies)?
7. Do you have other health problems?
   □ No    □ Yes (if yes, please state what they are)
8. What is your age?
9. What is the highest level of education that you have completed?
    □ Up to grade 8
    □ Grade 9-11
    □ Grade 12-13
    □ College or University
    □ Masters, Doctorate
10. What was the date of your admission?
11. What is today's date?

Thank you for participating. Your contribution is very much appreciated.
Appendix F

Rank Ordering of Uncertainty Items at Time 1
Table F-1: Rank Ordering of Uncertainty Items at Time 1

<table>
<thead>
<tr>
<th>#</th>
<th>Item</th>
<th>Mean</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.</td>
<td>what caused my condition</td>
<td>3.26</td>
<td>1</td>
</tr>
<tr>
<td>15.</td>
<td>about my baby’s chances to be healthy</td>
<td>3.19</td>
<td>2</td>
</tr>
<tr>
<td>41.</td>
<td>how long my symptoms will last</td>
<td>3.18</td>
<td>3</td>
</tr>
<tr>
<td>48.</td>
<td>about the cause of my symptoms</td>
<td>3.04</td>
<td>4</td>
</tr>
<tr>
<td>2.</td>
<td>about the stability of my condition</td>
<td>3.00</td>
<td>5</td>
</tr>
<tr>
<td>38.</td>
<td>about the unpredictability of symptoms</td>
<td>2.97</td>
<td>6</td>
</tr>
<tr>
<td>22.</td>
<td>whether my condition will return in this pregnancy</td>
<td>2.94</td>
<td>7</td>
</tr>
<tr>
<td>10.</td>
<td>whether my condition is under control</td>
<td>2.78</td>
<td>8</td>
</tr>
<tr>
<td>17.</td>
<td>whether my symptoms can be controlled</td>
<td>2.71</td>
<td>9</td>
</tr>
<tr>
<td>26.</td>
<td>whether my condition risks my baby’s life</td>
<td>2.71</td>
<td>9</td>
</tr>
<tr>
<td>45.</td>
<td>whether they might find something wrong when I go for a checkup</td>
<td>2.71</td>
<td>9</td>
</tr>
<tr>
<td>36.</td>
<td>about the seriousness of my condition</td>
<td>2.57</td>
<td>12</td>
</tr>
<tr>
<td>16.</td>
<td>whether my condition will be the same with the next pregnancy</td>
<td>2.53</td>
<td>13</td>
</tr>
<tr>
<td>56.</td>
<td>whether treatments I will be having will eliminate the condition</td>
<td>2.53</td>
<td>13</td>
</tr>
<tr>
<td>5.</td>
<td>about the present state of my condition</td>
<td>2.51</td>
<td>15</td>
</tr>
<tr>
<td>4.</td>
<td>whether I will be able to maintain my present level of functioning</td>
<td>2.50</td>
<td>16</td>
</tr>
<tr>
<td>18.</td>
<td>whether my condition will interfere with ability to do regular activities</td>
<td>2.48</td>
<td>17</td>
</tr>
<tr>
<td>#</td>
<td>Item</td>
<td>Mean</td>
<td>Rank</td>
</tr>
<tr>
<td>----</td>
<td>----------------------------------------------------------------------</td>
<td>------</td>
<td>------</td>
</tr>
<tr>
<td>37</td>
<td>about my ability to handle my emotions related to my condition</td>
<td>2.45</td>
<td>18</td>
</tr>
<tr>
<td>14</td>
<td>about my chances to be well during this pregnancy</td>
<td>2.40</td>
<td>19</td>
</tr>
<tr>
<td>39</td>
<td>whether I will have difficulty coping with my condition</td>
<td>2.40</td>
<td>19</td>
</tr>
<tr>
<td>35</td>
<td>whether delays in treatment will influence my baby’s chances</td>
<td>2.28</td>
<td>21</td>
</tr>
<tr>
<td>44</td>
<td>what unusual symptoms mean in terms of my condition</td>
<td>2.24</td>
<td>22</td>
</tr>
<tr>
<td>29</td>
<td>whether changes in my affect relationships within family</td>
<td>2.19</td>
<td>23</td>
</tr>
<tr>
<td>1</td>
<td>whether changes in my condition will be detected early</td>
<td>2.10</td>
<td>24</td>
</tr>
<tr>
<td>11</td>
<td>whether my condition will cause me to have symptoms</td>
<td>2.07</td>
<td>25</td>
</tr>
<tr>
<td>54</td>
<td>whether following the treatment plan will help</td>
<td>2.07</td>
<td>25</td>
</tr>
<tr>
<td>20</td>
<td>how to manage my symptoms</td>
<td>2.02</td>
<td>27</td>
</tr>
<tr>
<td>28</td>
<td>whether my treatment eliminated my condition</td>
<td>1.93</td>
<td>28</td>
</tr>
<tr>
<td>33</td>
<td>whether I can depend on test results as an indicator of my condition</td>
<td>1.91</td>
<td>29</td>
</tr>
<tr>
<td>52</td>
<td>what symptoms I should be aware of</td>
<td>1.86</td>
<td>30</td>
</tr>
<tr>
<td>55</td>
<td>what to look for to check the state of my condition</td>
<td>1.86</td>
<td>30</td>
</tr>
<tr>
<td>53</td>
<td>about how to choose the treatments I will have</td>
<td>1.84</td>
<td>32</td>
</tr>
<tr>
<td>30</td>
<td>whether changes in my pregnancy will affect relationships outside family</td>
<td>1.81</td>
<td>33</td>
</tr>
<tr>
<td>#</td>
<td>Item</td>
<td>Mean</td>
<td>Rank</td>
</tr>
<tr>
<td>-----</td>
<td>----------------------------------------------------------------------</td>
<td>------</td>
<td>------</td>
</tr>
<tr>
<td>32.</td>
<td>whether what I am doing about my condition will help me</td>
<td>1.77</td>
<td>34</td>
</tr>
<tr>
<td>9.</td>
<td>about the effectiveness of my treatments</td>
<td>1.75</td>
<td>35</td>
</tr>
<tr>
<td>51.</td>
<td>whether I can manage financially because of my condition</td>
<td>1.74</td>
<td>36</td>
</tr>
<tr>
<td>7.</td>
<td>whether changing my lifestyle behaviours will help my condition</td>
<td>1.72</td>
<td>37</td>
</tr>
<tr>
<td>13.</td>
<td>about differing explanations I have been given</td>
<td>1.72</td>
<td>37</td>
</tr>
<tr>
<td>27.</td>
<td>whether my condition risks my life</td>
<td>1.69</td>
<td>39</td>
</tr>
<tr>
<td>43.</td>
<td>whether I would choose to have all the recommended treatments</td>
<td>1.64</td>
<td>40</td>
</tr>
<tr>
<td>31.</td>
<td>whether my condition will affect my life goals</td>
<td>1.62</td>
<td>41</td>
</tr>
<tr>
<td>6.</td>
<td>what questions to ask my doctors about my condition</td>
<td>1.59</td>
<td>42</td>
</tr>
<tr>
<td>8.</td>
<td>how to make sense of what I'm told about my condition</td>
<td>1.57</td>
<td>43</td>
</tr>
<tr>
<td>40.</td>
<td>about the quality of information I have</td>
<td>1.56</td>
<td>44</td>
</tr>
<tr>
<td>34.</td>
<td>whether my condition will affect my sex life</td>
<td>1.50</td>
<td>45</td>
</tr>
<tr>
<td>49.</td>
<td>whether I can depend on people to be there when I need them</td>
<td>1.47</td>
<td>46</td>
</tr>
<tr>
<td>12.</td>
<td>what to say to others about my condition</td>
<td>1.46</td>
<td>47</td>
</tr>
<tr>
<td>21.</td>
<td>about choices I have made regarding my treatments</td>
<td>1.41</td>
<td>48</td>
</tr>
<tr>
<td>23.</td>
<td>about adequacy of follow-up</td>
<td>1.38</td>
<td>49</td>
</tr>
<tr>
<td>42.</td>
<td>whether I'm being told truth about my condition</td>
<td>1.36</td>
<td>50</td>
</tr>
<tr>
<td>47.</td>
<td>whether I'll be well cared for by health care professionals other than nurses</td>
<td>1.33</td>
<td>51</td>
</tr>
<tr>
<td>#</td>
<td>Item</td>
<td>Mean</td>
<td>Rank</td>
</tr>
<tr>
<td>----</td>
<td>---------------------------------------------------------------------</td>
<td>------</td>
<td>------</td>
</tr>
<tr>
<td>46</td>
<td>whether I’ll be well cared for by nurses</td>
<td>1.29</td>
<td>52</td>
</tr>
<tr>
<td>25</td>
<td>how to approach health care workers about my care</td>
<td>1.26</td>
<td>53</td>
</tr>
<tr>
<td>50</td>
<td>whether I can get insurance</td>
<td>1.26</td>
<td>53</td>
</tr>
<tr>
<td>24</td>
<td>about my understanding of the treatments I’ve received</td>
<td>1.24</td>
<td>55</td>
</tr>
<tr>
<td>19</td>
<td>about my doctor’s abilities</td>
<td>1.14</td>
<td>56</td>
</tr>
</tbody>
</table>
Appendix G

Rank Ordering of Uncertainty Items at Time 2
<table>
<thead>
<tr>
<th>#</th>
<th>Item</th>
<th>Mean</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>38.</td>
<td>about the unpredictability of my symptoms</td>
<td>2.56</td>
<td>1</td>
</tr>
<tr>
<td>41.</td>
<td>how long my symptoms will last</td>
<td>2.51</td>
<td>2</td>
</tr>
<tr>
<td>15.</td>
<td>about my baby’s chances to be healthy</td>
<td>2.49</td>
<td>3</td>
</tr>
<tr>
<td>22.</td>
<td>whether condition will return in this pregnancy</td>
<td>2.48</td>
<td>4</td>
</tr>
<tr>
<td>3.</td>
<td>what caused my condition</td>
<td>2.40</td>
<td>5</td>
</tr>
<tr>
<td>16.</td>
<td>whether condition will be same in next pregnancy</td>
<td>2.38</td>
<td>6</td>
</tr>
<tr>
<td>17.</td>
<td>whether symptoms can be controlled</td>
<td>2.37</td>
<td>7</td>
</tr>
<tr>
<td>48.</td>
<td>about the cause of my symptoms</td>
<td>2.28</td>
<td>8</td>
</tr>
<tr>
<td>2.</td>
<td>about the stability of my condition</td>
<td>2.26</td>
<td>9</td>
</tr>
<tr>
<td>18.</td>
<td>whether condition will interfere with ability to do regular activities</td>
<td>2.26</td>
<td>9</td>
</tr>
<tr>
<td>4.</td>
<td>whether I’ll be able to maintain present level of functioning</td>
<td>2.21</td>
<td>11</td>
</tr>
<tr>
<td>10.</td>
<td>whether my condition is under control</td>
<td>2.19</td>
<td>12</td>
</tr>
<tr>
<td>26.</td>
<td>whether condition risks baby’s life</td>
<td>2.14</td>
<td>13</td>
</tr>
<tr>
<td>39.</td>
<td>whether I’ll have difficulty coping with my condition</td>
<td>2.09</td>
<td>14</td>
</tr>
<tr>
<td>14.</td>
<td>about my chances to be well during this pregnancy</td>
<td>2.05</td>
<td>15</td>
</tr>
<tr>
<td>45.</td>
<td>whether they might find something wrong when I go for a checkup</td>
<td>2.05</td>
<td>15</td>
</tr>
<tr>
<td>56.</td>
<td>whether treatments I’ll be having will eliminate the condition</td>
<td>2.02</td>
<td>17</td>
</tr>
<tr>
<td>5.</td>
<td>about the present state of condition</td>
<td>1.91</td>
<td>18</td>
</tr>
<tr>
<td>#</td>
<td>Item</td>
<td>Mean</td>
<td>Rank</td>
</tr>
<tr>
<td>----</td>
<td>---------------------------------------------------------------------</td>
<td>------</td>
<td>------</td>
</tr>
<tr>
<td>11</td>
<td>whether condition will cause me to have symptoms</td>
<td>1.84</td>
<td>19</td>
</tr>
<tr>
<td>54</td>
<td>whether following the treatment plan will help</td>
<td>1.84</td>
<td>20</td>
</tr>
<tr>
<td>20</td>
<td>about how to manage my symptoms</td>
<td>1.83</td>
<td>21</td>
</tr>
<tr>
<td>36</td>
<td>about the seriousness of condition</td>
<td>1.79</td>
<td>21</td>
</tr>
<tr>
<td>37</td>
<td>about ability to handle emotions related to my condition</td>
<td>1.79</td>
<td>21</td>
</tr>
<tr>
<td>28</td>
<td>whether treatments eliminated my condition</td>
<td>1.79</td>
<td>24</td>
</tr>
<tr>
<td>35</td>
<td>whether delays in treatment will influence my baby’s chances</td>
<td>1.76</td>
<td>25</td>
</tr>
<tr>
<td>44</td>
<td>what unusual symptoms mean in terms of my condition</td>
<td>1.74</td>
<td>25</td>
</tr>
<tr>
<td>29</td>
<td>whether changes in pregnancy affect relationships within my family</td>
<td>1.74</td>
<td>27</td>
</tr>
<tr>
<td>33</td>
<td>whether I can depend on test results as indicator of my condition</td>
<td>1.72</td>
<td>27</td>
</tr>
<tr>
<td>9</td>
<td>about effectiveness of treatments</td>
<td>1.72</td>
<td>29</td>
</tr>
<tr>
<td>1</td>
<td>whether changes in condition will be detected early</td>
<td>1.62</td>
<td>30</td>
</tr>
<tr>
<td>32</td>
<td>whether what I’m doing about my condition will help</td>
<td>1.61</td>
<td>31</td>
</tr>
<tr>
<td>13</td>
<td>about differing explanations I have been given</td>
<td>1.58</td>
<td>32</td>
</tr>
<tr>
<td>52</td>
<td>what symptoms I should be aware of</td>
<td>1.55</td>
<td>32</td>
</tr>
<tr>
<td>30</td>
<td>whether changes in pregnancy will affect relationships outside family</td>
<td>1.55</td>
<td>34</td>
</tr>
<tr>
<td>34</td>
<td>whether my condition will affect my sex life</td>
<td>1.49</td>
<td>34</td>
</tr>
<tr>
<td>#</td>
<td>Item</td>
<td>Mean</td>
<td>Rank</td>
</tr>
<tr>
<td>-----</td>
<td>----------------------------------------------------------------------</td>
<td>------</td>
<td>------</td>
</tr>
<tr>
<td>8.</td>
<td>how to make sense of what I’m told about my condition</td>
<td>1.45</td>
<td>36</td>
</tr>
<tr>
<td>43.</td>
<td>whether I’d choose to have all the treatments recommended</td>
<td>1.44</td>
<td>37</td>
</tr>
<tr>
<td>53.</td>
<td>about how to choose the treatments I’ll have</td>
<td>1.43</td>
<td>38</td>
</tr>
<tr>
<td>7.</td>
<td>whether changing my lifestyle behaviours will help my condition</td>
<td>1.42</td>
<td>39</td>
</tr>
<tr>
<td>27.</td>
<td>whether my condition risks my life</td>
<td>1.42</td>
<td>39</td>
</tr>
<tr>
<td>31.</td>
<td>whether condition will affect my life goals</td>
<td>1.42</td>
<td>39</td>
</tr>
<tr>
<td>40.</td>
<td>about quality of information I have</td>
<td>1.42</td>
<td>39</td>
</tr>
<tr>
<td>21.</td>
<td>about choices I’ve made regarding my treatments</td>
<td>1.40</td>
<td>43</td>
</tr>
<tr>
<td>49.</td>
<td>whether I can depend on people to be there when I need them</td>
<td>1.40</td>
<td>43</td>
</tr>
<tr>
<td>51.</td>
<td>whether I can manage financially because of my condition</td>
<td>1.38</td>
<td>45</td>
</tr>
<tr>
<td>55.</td>
<td>what to look for to check the state of my condition</td>
<td>1.38</td>
<td>45</td>
</tr>
<tr>
<td>6.</td>
<td>what questions to ask my doctors about my condition</td>
<td>1.34</td>
<td>47</td>
</tr>
<tr>
<td>12.</td>
<td>what to say to others about my condition</td>
<td>1.33</td>
<td>48</td>
</tr>
<tr>
<td>23.</td>
<td>about the adequacy of follow-up I am having</td>
<td>1.31</td>
<td>49</td>
</tr>
<tr>
<td>24.</td>
<td>about my understanding of treatments I have received</td>
<td>1.23</td>
<td>50</td>
</tr>
<tr>
<td>25.</td>
<td>how to approach health care workers about my care</td>
<td>1.23</td>
<td>50</td>
</tr>
<tr>
<td>42.</td>
<td>whether I’m being told the truth about my condition</td>
<td>1.23</td>
<td>50</td>
</tr>
<tr>
<td>19.</td>
<td>about my doctors’ abilities</td>
<td>1.14</td>
<td>53</td>
</tr>
<tr>
<td>#</td>
<td>Item</td>
<td>Mean</td>
<td>Rank</td>
</tr>
<tr>
<td>-----</td>
<td>----------------------------------------------------------------------</td>
<td>------</td>
<td>------</td>
</tr>
<tr>
<td>46.</td>
<td>whether I will be well cared for by the nurses</td>
<td>1.14</td>
<td>53</td>
</tr>
<tr>
<td>47.</td>
<td>whether I will be well cared for by health professionals other than nurses</td>
<td>1.12</td>
<td>55</td>
</tr>
<tr>
<td>50.</td>
<td>whether I can get insurance</td>
<td>1.10</td>
<td>56</td>
</tr>
</tbody>
</table>