Use of NICU Education to Decrease Stress for Prenatal Patients on Bed Rest

Kim Murcek, BSN, APRN, NNP-BC

&

Lori Baas Rubarth, PhD, APRN, NNP-BC

Submitted on April 2, 2012

in partial fulfillment of the Masters of Science in Nursing degree

from the Graduate School and the School of Nursing

Creighton University, Omaha, NE

Abstract

Preterm birth is a leading cause of neonatal death and antepartum bed rest has been a mainstay of treatment to prevent preterm birth. Bed rest can have physiologic, behavioral, social, economic, and emotional impact on families causing undue stress. Providing antenatal education about the neonatal intensive care unit (NICU) may decrease maternal stress levels and improve outcomes of premature infants. The purpose of this study was to decrease the amount of perceived stress of high risk pregnant women on bed rest due to pregnancy complications. A quantitative, experimental design with a qualitative component was used. Study participants were randomly assigned to one of two groups: 1) access to a private blog with no further intervention (control group), and 2) access to a private blog plus access to NICU education with an advanced practice nurse via the internet (intervention group). Results of the independent T-test of the 119 subjects who participated in the study showed no significant difference between the two groups; however, a tour of the NICU prior to delivery and NICU education may be beneficial interventions to all high risk women. In conclusion, this study will help health care providers understand more fully the high risk antepartum patient's experience on bed rest in order to improve the quality of the woman's care.

Use of NICU Education to Decrease Stress

for Prenatal Patients on Bed Rest

Preterm birth is the major maternal-child health issue around the world and the leading cause of perinatal mortality and morbidity. According to the March of Dimes (2011) more than a half million babies are born prematurely each year in the United States. The United States preliminary preterm rate for 2009 was 12.18% according to the National Center of Health Statistics in 2010 which is down 5% from 2006 (Hamilton, Martin, & Ventura, 2010). Prescribed antepartum bed rest and activity restrictions have been a mainstay of treatment to prevent preterm birth for the past thirty years for nearly one million women in the United States annually (Maloni, 2010). Antepartum bed rest can have physiologic, behavioral, social, economic, and emotional impact on patients and families causing undue stress.

Increased maternal stress levels while on bed rest may result in a higher number of premature births and therefore, low birth weight infants (Mercer et al., 2006). Stressors associated with antepartum bed rest include: monotony of lying in bed; unable to perform daily tasks; disconnection from family, children, and friends; concern for the health of their infant and themselves; loss of control and feeling helpless (Gupton, Heaman, & Ashcroft, 1997). Fears concerning the development of the infant and the Neonatal Intensive Care Unit (NICU) stay are two increased concerns of the prenatal patient. Decreasing the stress of those on prenatal bed rest could lead to better health and outcomes of the pregnancy (Orr, Reiter, Blazer, & James, 2007; Richter, Parkes, & Chaw-Kant, 2007).

Four key areas have been described as promoting optimal outcomes for the prenatal patients on bed rest: education, support, recreation, and outreach (Thorman & McLean, 2006). Orr et al. (2007) found most prior research has identified associations between exposures to

stressors with poor pregnancy outcomes; however these findings have not been easily utilized to develop interventions to reduce maternal stressors. Only a few studies have shown prenatal women had decreased stress if they knew what to expect when and after their infant was born (Adler & Zarchin, 2002; Hanson, VandeVusse, Roberts & Forristal, 2009; Orr et al., 2007; Richter et al., 2007). Some advanced practice nurses, physicians, and social workers have integrated education about the NICU in their practice. In fact, at some institutions a neonatology consult is made available to all prenatal patients on bed rest. However, there have been few studies reporting the responses of these interventions.

Research is deficient regarding antenatal education and its influence on maternal stress levels for high-risk prenatal patients on bed rest. The correlation between stress and preterm birth is not well understood. Providing NICU education to prenatal patients on antepartum bed rest by advanced practice neonatal nurses may decrease maternal stress levels and improve outcomes of premature infants. Therefore, the purpose of this research study was to decrease the amount of perceived stress of high risk pregnant women on bed rest due to pregnancy complications.

Literature Review

The intention of the literature review was to gather information on perceived stress levels of antepartum patients and interventions to alleviate the stressors to improve outcomes for the prenatal patient on bed rest and their infant. The focus of the literature review was based on antepartum bed rest, perceived prenatal stress, effects of maternal stress, and stress management strategies including NICU education. These were the key variables of the study.

Antepartum Bed Rest

Activity restriction or antepartum bed rest can be defined as confinement to bed and restriction of activity except for toileting needs (Maloni, 2010). Antepartum bed rest is used by many perinatologists and obstetricians to prevent preterm birth that may occur as a result of a maternal medical condition. Many studies have been conducted on the effect of hospitalization or restricted activity on high-risk antepartum patients (Grote & Bledsoe, 2007; Maloni, 2010; Mercer et al., 2006). However, qualitative studies addressing the needs of these patients from their perspective are scarce.   Antepartum bed rest for high-risk prenatal patients has been associated with a variety of physiologic, psychological and behavioral maternal and fetal adverse effects and is a highly negative experience for women according to Maloni (2010).

Perceived Prenatal Stress

Hospitalization is almost always a stressful experience.   There are many associated stressors with antepartum bed rest. Stressor can have many different meanings. A stressor can be defined as a stimulus that causes physical, chemical, or emotional factors that cause mental or bodily tension (Black, 2007). Pregnancy itself has been known and studied to be a stressor. A comparison study done by Mercer et al. (2006) found women with recurrent spontaneous preterm births experienced higher levels of stress than those who had normal previous pregnancies. Fear of the unknown and uncertainty can cause stress for any high-risk pregnant woman (Thorman & McLean, 2006). Providing antenatal education for these prenatal women on bed rest may decrease their fear and uncertainties.

Gupton et al. (1997) identified stressors of pregnant women to include the bed rest itself, the change in lifestyle, separation from home and family, boredom, concerns for health of both parties involved (mom and baby), loss of control, loss of activity, and feelings of hopelessness.

According to their research, decreasing the number of stressors can decrease the manifestations of stress, which could lead to prolonged gestation and length of pregnancy. Richter et al. (2007) discovered pregnant women find bed rest stressful and often experience feelings of depression, boredom, isolation anxiety, and somatic complaints. These findings were drawn from a qualitative descriptive study which had a clear purpose to explore the needs of high-risk antepartum patients in order to plan interventions to reduce stress however; the sample size of thirteen limited the study.

Effects of Maternal Stress

Bed rest can increase stress on the mother and fetus. A retrospective, correlational, and comparative study done by Black (2007) suggested stress increased the incidence of gestational diabetes and pre-eclampsia. The development of these conditions may lead to preterm labor, preterm birth, and small for gestational age infants. The Perceived Stress Scale and Index of Well-Being were used to measure the psychological stress levels of patients in the study by Black.

Orr et al. (2007) performed a study focusing on prenatal pregnancy-related anxiety and spontaneous preterm birth. A six item likert scale derived from the Prenatal Social Environment Inventory was used. After adjustment for covariates of risk factors for preterm outcomes such as prior poor pregnancy outcome, bleeding, smoking, and race they found women with higher levels of pregnancy-related anxiety had a significantly increased risk of spontaneous preterm birth.

Stress Management Strategies

Literature explored after 2000 reveals researchers focusing on support groups as an intervention to reduce anxiety and stress for those women on antepartum bed rest. Adler and

Zarchin (2002) assessed the value of a virtual focus group as an online peer support group for women on bed rest. All the participants in the study agreed their participation in the focus group was valuable and beneficial in helping them cope with their situation. The requirement of the participants having access to a computer at the time was a limitation of the study. If replicated now with increased availability of internet services, the study could be strengthened by an increased sample size with participants enrolling from various diverse populations.

Thorman and McLean (2006) found high-risk women had less stress if admitted to a hospital with support systems in place. They acknowledged a family-focused online antepartum support program used to provide an atmosphere to minimize the adverse effects of prolonged hospitalization. Included in the article were current websites for use by hospitalized high-risk antepartum patients. According to Grote and Bledsoe (2007), looking forward to the future and being optimistic can reduce depression and lower stress to improve the outcomes for pregnant women. Researchers recommend future clinical trials are needed to identify interventions which can alleviate stress (Black, 2007; Thorman & McLean, 2006).

A study by Doyle, Monga, Kerr, and Hollier (2004) was done to recognize stressors in pregnant women requiring bed rest by using a modified Antepartum Hospital Stressors Inventory (AHSI). The results revealed stress was relieved in all women by ultrasounds, family members staying in room, cable television, and internet access. The results were subjected to recall bias because of the retrospective nature of the design. Doyle et al. (2004) recommended internet access as an amenity which all hospitals should provide and in 2012 this is becoming a reality.

NICU Education

It is well documented in the literature women have increased stress and anxiety during pregnancy, however few studies were found on how to decrease antenatal stress levels. Thorman

and McLean (2006) identified four opportunities to promote optimal outcome for prenatal women on bed rest. These opportunities were education, support, recreation, and outreach. They identified NICU education as a priority for these women and their families. NICU education consisted of literature, videos, and weekly updates on fetal development, preterm labor education, and premature infant care. Another primary focus seen by Thorman and McLean (2006) was to provide the parents the opportunity to visit the NICU prior to birth to decrease anxiety and to become familiar with the NICU environment.

Hanson et al. (2009) examined and critiqued four sets of prenatal care guidelines in which one guideline involved education and counseling topics. In his appraisal women valued counseling, education, and support groups that complemented their prenatal care. However, these women identified that these services were not readily available to them. A questionnaire presented to NICU parents by Kowalski, Leef, Mackley, Spear, and Paul (2006) revealed the parents need for information was one of their most important concerns. These parents felt obtaining information was important because it helped them decrease their feeling of stress and helped them cope with the fear and uncertainty of their situation. These findings were related to having a premature infant in the NICU and not necessarily to antepartum bed rest. These findings nevertheless could be used to identify NICU education as a stress reliever for the prenatal woman on bed rest.

Summary

The review of the literature revealed studies were descriptive, qualitative, retrospective, correlational, comparison, and narrative in their designs. Systematic reviews, randomized controlled clinical trials, and experimental designs are lacking. The literature identified many factors that influence pregnancy and one of these factors is stress, however a correlation between

stress and preterm birth has not been well documented. Many studies have demonstrated a relationship between increased stress levels and antepartum bed rest. There is a gap in research regarding antenatal education and its relationship on stress levels for high-risk patients on prenatal bed rest, specifically related to NICU education. Although most prior research has identified associations between exposures to stressors with poor pregnancy outcomes, these findings have not been fully utilized to develop interventions to reduce stress thereby decreasing the incidence of preterm births. Therefore, the hypothesis of this study was by providing online NICU education via the "Mom's In Waiting" website by advanced practice registered nurses would decrease the amount of perceived stress of prenatal patients on bed rest due to pregnancy complications.

Theoretical Framework

The theoretical framework used for this study was the Uncertainty in Illness theory by Mishel. The theory was developed to explain how patients cognitively process illness-related events and construct meaning for their illness. This theory proposes that uncertainty occurs when patients have difficulty explaining a clear perception of their illness. There is a relationship between uncertainty and stress in the fact that uncertainty may reduce a person's ability to manage a situation (Mishel & Clayton, 2008). It has been proposed that uncertainty experienced in illness situations are ambiguous, complex, uninformed, and unpredictable (Guadalupe, 2010).

The theory is composed of three major themes: antecedents of uncertainty, appraisal of uncertainty, and coping with uncertainty (Mishel & Clayton, 2008). The key concepts of the theory by Mishel and Clayton (2008) are uncertainty and cognitive schema which also fit within the study. Uncertainty is defined as the inability to determine the meaning of illness-related

events (Guadalupe, 2010). Cognitive schema is defined as the person's subjective interpretation of illness-related events (Mishel & Clayton, 2008).

The three major antecedents of uncertainty include: stimuli frame (symptom pattern, event familiarity, event congruence); structure providers (education, social support, credible authority), and cognitive capacities (Guadalupe, 2010). Education, social support, anxiety, and stress are all other key variables studied during this research study which are linked to these antecedents. These antecedents are interrelated because stimuli frame components are positively affected by structure providers and cognitive capacities and structure providers influence the stimuli frame.

The theory of Uncertainty in Illness can be linked to this study because a high-risk patient on antepartum bed rest is uncertain about her pregnancy, her infant, and stressed by many unknown factors one being lack of information about her condition which makes the situation more complex and unpredictable. The lack of prior experiences of the prenatal patient on bed rest leads to uncertainty. The prenatal patient on bed rest experiences not only physical symptoms, but also an environment change as well as uncertainty in regards to expected outcomes versus what the actual outcome will be. These experiences are congruent with the stimuli frame components of the Theory of Uncertainty. The theory can provide a framework for advanced practice nurse practitioners to identify factors related to uncertainty to assist in caring for the high-risk antepartum patient on bed rest.

The structure providers of the theory positively influence the degree of uncertainty related to the factors within the stimuli frame because education, social support, and credible authority can alleviate uncertainty (Guadalupe, 2010). The credible authority component of the theory of Uncertainty in Illness is directly linked to the study because health professionals

including advanced practice nurses have the ability to reduce uncertainty by providing information to the patient. Mishel and Clayton (2008) found that having less education correlated with higher levels of uncertainty. Guadalupe (2010) found the role of social support can have a direct affect on uncertainty. Providing accurate information and education as well as social support to the high-risk women on antepartum bed rest may reduce their uncertainty.

A patient's cognitive capacity may have a direct affect on the degree of uncertainty.   The cognitive capacity of the women on prenatal bed rest needs to be assessed. If the women on prenatal bed rest have a decreased ability to process information due to stress, this may affect their interpretation of their situation.

A previous study by Guadalupe (2010) applied the Mishel's Theory of Uncertainty in Illness in understanding a meningioma diagnosis. Uncertainty is probably the most certain thing a patient will experience when diagnosed with a meningioma. It is not uncommon for those diagnosed with a meningioma to feel uncertain about whether watchful waiting, surgical resection or radiosurgery is the right option. The vague symptom pattern associated with meningiomas contributed to higher levels of uncertainty and event familiarity was difficult to establish because of the usual incidental finding of a meningioma (Guadalupe, 2010). Similarly, due to symptom variability, coping with the diagnosis of a meningioma can be very uncertain therefore the structural providers of education, social support, and credible authorities were made available.

The Mishel Uncertainty in Illness Scale has been used to measure a variety of factors related to uncertainty. In the study by Guadalupe (2010) 90% of patients chose surgical resection after receiving comprehensive information about the benefits and risks of surgery including alternatives, by the health care team, to ensure that decisions were based on factual

information and not fear. Reduction of uncertainty was among the primary reasons that surgical

resection was chosen. The results of the study reported that 95% would recommend the same

treatment and that social support, credible authority and event familiarity had the most influence

on reducing uncertainty (Guadalupe, 2010).

The findings in the study by Guadalupe (2010) support the Uncertainty in Illness model

because the theory provides a framework for health care professionals to better understand

factors or antecedents that contribute to uncertainty about treatment options of a meningioma.

Health care professionals who understand the role that uncertainty plays before and after

treatment decision is made have an opportunity in assisting the patient to understand the role of

uncertainty on decisions surrounding the diagnosis of a meningioma.

The theory of Uncertainty in Illness can be applied to the meningioma study by

Guadalupe (2010) as well as this study because these patients have many uncertainties. The

theory provides a framework for advanced practice nurses to recognize factors related to

uncertainty to support the antepartum patient on bed rest. Providing NICU education to high-

risk women on bed rest may alleviate uncertainty and maternal stress and improve outcomes for

the patient and infant.

Methods

Design

The research design for this study was a mixed-method study. The study used a

quantitative, experimental design with a qualitative component. The participants were randomly

assigned to one of two groups. The two groups included: 1) access to a private blog with no

intervention (control group), and 2) access to NICU education with an advanced practice

neonatal nurse practitioner via the internet (intervention group). All participants were provided a

journal for recording their thoughts, feelings, and experiences or they could blog on the "Mom's In Waiting" website (www.momsinwaiting.com). The control group was provided the journal or blog only and received routine care for their high-risk pregnancy. The intervention group kept a journal or blog as well as receiving NICU education weekly until birth via the website.

Sample and Setting

A convenience sample of pregnant female patients who were hospitalized at Methodist Women's Hospital, Creighton University, and Bergan Mercy Medical Center on high-risk antepartum bed rest was eligible to participate in the study. Inclusion criteria for the study included high-risk prenatal women over 19 years of age who were placed on bed rest, able to read, write, and speak English, and have access to a computer with available internet access. The participants were required to be between 18 and 36 weeks gestation to be considered high-risk.

Ethical Considerations

The study was approved by the Institutional Review Board at Methodist Women's Hospital and Creighton University. Participation in the study was optional therefore informed consent was waived. Informed consent was obtained if the journal entries were copied for qualitative analysis. Each subject via the website was given information on the Bill of Rights for research participants (See Appendix A). The subjects were informed that all information and data shared through journaling or blogging would be kept confidential. The participants were informed they did not have to give their real name but their E-mail address would be used for gathering information. The information on the website is a private site for the participants in the study only. Possible risks and benefits of participating in the study were addressed to all subjects.

Measurement Methods

The measurement tool used to measure the mother's stress level was the Perceived Stress Scale (PSS-10) adapted from Cohen, Kamarck, and Mermelstein (1983). The PSS-10 is a 10 item tool using a five point scale of likert measurement (see Appendix B). The questions in the scale ask about feelings and thoughts during the hospitalization. It is intended to make comparisons of the perceived stress of subjects as related to current events. The Perinatal Data Collection form consists of demographic information and was completed upon enrollment (see Appendix C). The form includes data related to name, age, expected date of confinement, length of bed rest, week of gestation, and perinatal complications. After giving birth, the participants were asked to complete the Post-Delivery Maternal Survey (see Appendix D). The survey consists of eight questions with a scoring system of 1-5 and a comment section. This survey provided feedback on the participants' entire experience from prenatal hospitalization to birth outcomes. The Perinatal Data Collection form and the Post Delivery Maternal Survey were researcher developed.

Data Collection Procedures

The registered nursing staff on the high-risk obstetric care floor assisted with the initial contact with patients meeting the study criteria. Upon identifying a patient meeting the inclusion criteria, one of the investigators, an advanced practice neonatal nurse practitioner, explained the purpose of the study and helped the participant enroll by providing information about the website. The computer randomly assigned the patient to one of the two groups. With initial enrollment the Perinatal Data Collection form was collected and the participant was asked to complete the PSS-10 survey online. After enrollment the PSS-10 survey was to be completed weekly via the internet until delivery. The participant was sent an email each week as a reminder

to fill out the weekly survey. The participants were provided a journal and encouraged to record

or blog their experiences throughout their prenatal bed rest. Data were collected from November

2010 thru February 2012.

The participants who were randomly assigned to the intervention group were provided a

website address and a helpline telephone number for accessing the NICU education website and

encouraged to blog or log information into their journal. The NICU education and information

could be found on the website. This information included NICU environment, gestational age

and development milestones, common procedures, and routine infant care in the NICU. The

control group received standard high-risk prenatal care and was asked to keep a journal of their

thoughts and feelings or blog on the website. These journal entries were copied for qualitative

analysis after consent had been obtained. After delivery the participant was asked to complete

the Post-Delivery Maternal Survey about their experience.

Data Analysis

The data obtained were used to compare the control group to the intervention group to

determine if NICU education helped decrease stress for the pregnant women on antepartum bed

rest. The independent T-test was used to analyze and compare the difference between the two

groups. The independent variable was the antenatal education regarding the NICU. The

dependent variable was the level of stress reported by the high-risk pregnant women using the

PSS-10 scales. The scores from the perceived stress survey were compared between the two

groups.

The Post-Delivery Maternal Survey was analyzed to determine the perceptions of the

education and support provided to the mother in the hospital and at home, and her overall

feelings of stress. A descriptive analysis of the demographics of each group and the sample was

completed. The qualitative part of the study focused on the experiences and perceptions of the antepartum patient on prenatal bed rest. The journal or blog entries were analyzed using a phenomenological methodology. Content analysis was done by faculty researchers of the study.

<div align="center">

Results

</div>

Characteristics of Participants

One hundred nineteen high risk pregnant women on bed rest fulfilled the inclusion criteria and were included in the randomized, experimental, quantitative and qualitative evaluation. Maternal age of the participants ranged from 19 to 41 years with a mean age of 30. The mean gestational age of the participants was 25.5 weeks with the range of 18-33 weeks. Approximately 66% of the participants were singleton pregnancies and 33% were multiple pregnancies. Sixty-nine percent of the infants born to these women were admitted to the NICU after delivery.

Findings

Of the 119 participants 50 did 2 surveys (42%), 30 did 3 surveys (25%), 19 did 4 surveys (16%), and 11 did 5 surveys (9%) prior to delivering. After analysis, there was no significant difference between the intervention group (NICU education) and the control group (no education). The PSS-10 scores showed that stress did decrease slightly for the intervention group over time with the initial mean score of 16.85 compared to the end mean score of 16.29. The PSS-10 scores for the control group over time showed a slight increase with the initial score of 15.92 compared to the end mean score of 16.25.

The Post-Delivery Maternal Survey was completed by 29 participants (24%). Possible scores were from 1-5 with 1 being minimal and 5 very stressful. Survey questions related to stress with hospital stay and bed rest experience had average scores of 2.7 and 3.1 respectively.

The help of an online support group (2.6) and the journal/blog (2.9) had the lowest average mean scores. Interventions were scored with 1 being minimal and 5 very helpful. The highest rated interventions were tours of the NICU with an average score of 4.2, followed by NICU education with an average score of 3.9. Forty-five percent of the 29 who filled out the Post-Delivery Maternal Survey were given a tour of the NICU prior to delivery. The question related to how many NICU nurse or neonatologist visits they received during their hospitalization varied from none, daily, and too many.

The qualitative component of the study consisted of comments received from participants on ways to decrease their stress levels. These comments consisted of having consistent caregivers, consistent plan of care, more sleep, place for family to stay, and social support among others on prenatal bed rest.

Discussion

Conclusion

The intent of this study was to decrease the amount of perceived stress of high risk pregnant women on bed rest due to pregnancy complications by providing NICU education and to gain an understanding of the experience of prenatal bed rest. Although the results were not significant, the feedback from the participants was overall positive. Considering there was a slight decrease in maternal stress levels over time is positive, however, it may be possible the decreased stress could be related to increased gestational age.

Our findings are consistent with the limited literature about the response of interventions such as NICU education and online support to reduce stress; however, the participants of the study did highlight the interventions of the NICU tour and NICU education to be beneficial. It may be possible to reduce the stress of antepartum women on bed rest given the positive feedback related to NICU education and online support from this study. The qualitative

component of the study will help develop future interventions to relieve stress such as providing

a consistent plan of care with consistent caregivers and involving the whole family. Therefore,

this study will help health care providers understand more fully the high risk antepartum

patient's experience on bed rest in order to improve the quality of the woman's care and

potentially decrease maternal stress levels and improve outcomes of their infants.

Limitations

Limitations of the study included a small sample size during the time table of data

collection and poor compliance of the participants completing the surveys weekly. Post delivery

can be a stressful and busy time with or without the infant in the NICU and may have contributed

to the poor compliance of completing the post-delivery survey. The requirement of the

participants having access to a computer at the time was a limitation of the study. Some women

delivered soon after enrollment in the study and some subjects were lost due to their short

hospitalization stay. In addition, the investigators did not have control of the partaking in the

journal or blogging entries and were solely reliant on the subjects' participation.

Implications for Nursing Practice/Education

Women experiencing high risk pregnancies should be assessed for their perception of the

complication and their perceived stress. Many studies have demonstrated a relationship between

increased stress levels and antepartum bed rest. The qualitative component of this study

contributes to the existing knowledge related to the needs and interventions specific to the

support of high risk pregnant women on bed rest and their stress levels. Implications for

advanced practice nursing are to have an understanding of the impact of antepartum bed rest on

women's lives in order to develop appropriate stress relieving interventions for this unique

population. Providing guidance about the management of stressors also needs to involve the

whole family of the woman on bed rest. Reducing maternal stressors may contribute to a better birth outcome.

Future Research

Future quantitative and qualitative research could investigate, through the use of controlled, randomized trials, the effectiveness of NICU education and online support groups to decrease stress levels of high-risk mothers on bed rest to improve neonatal outcomes. Improving post delivery tracking of a mother's thoughts, feelings and experiences is needed to further gather information. Ideally, internet access could be provided to participants while they are hospitalized or at home to extend the benefits and allow researchers to continue to study the effects of NICU education and online support groups. With increased availability of internet services future studies could be strengthened by an increased sample size and uniting individuals from various diverse populations. Health care professionals, including advanced practice nurses, are in a unique position to take advantage of this technological opportunity to gain more knowledge and improve outcomes.

<div align="center">

Summary

</div>

In summary, women have increased stress and anxiety during pregnancy especially when placed on prenatal bed rest due to pregnancy complications. This undue stress may contribute to premature births and therefore, low birth weight infants. Providing a NICU tour prior to delivery, NICU education and online support groups are interventions that may reduce maternal stress levels which may improve outcomes of the mother and infant. Understanding more fully the high risk antepartum patient's experience on bed rest will help all health care providers, including advanced practice nurses, improve the quality of the woman's care, which could lead to prolonged gestation and length of pregnancy.

References

Adler, C., & Zarchin, Y. (2002). The "virtual focus group": Using the internet to reach

    pregnant women on home bed rest. *Journal of Obstetric, Gynecologic, and Neonatal*

    Nursing, 31 (4), 418-427.

Black, K. D. (2007). Stress, symptoms, self-monitoring confidence, well-being, and social

    support in the progression of preeclampsia/gestational hypertension. *Journal of*

    Obstetric, Gynecologic, and Neonatal Nursing, 35 (5), 419-428.

Cohen, S., Kamarck, T., & Mermelstein, R. (1983). A global measure of perceived stress.

    Journal of Health and Social Behavior, 24, 385-396.

Doyle, N. M., Monga, M., Kerr, M., & Hollier, L. M. (2004). Maternal stressors during

    prolonged antepartum hospitalization following transfer for maternal-fetal indications.

    American Journal of Perinatology, 21 (1), 27-30.

Grote, N. K., & Bledsoe, S.E. (2007). Predicting postpartum depressive symptoms in new

    mothers: The role of optimism and stress frequency during pregnancy. *Health and*

    Social Work, 32 (2), 107-118.

Guadalupe, K. (2010). Understanding a meningioma diagnosis using mishel's theory of

    uncertainty in illness. *British Journal of Neuroscience Nursing, 6 (2), 77-82.*

Gupton, A., Heaman, M., & Ashcroft, T. (1997). Bed rest from the perspective of the high-risk

    pregnant woman. *Journal of Obstetrics, Gynecologic, and Neonatal Nursing, 2*6, 423-

    430.

Hamilton, B. E., Martin, J. A., & Ventura, S. J. (2010). Births: Preliminary data for 2010.

    National vital statistics reports, 59 (3), 1-29. Hyattsville, MD: National Center for

    Health Statistics. Retrieved from www.cdc.gov/nchs/data/nvsr59

Hanson, L., VandeVusse, L., Roberts, J., & Forristal, A. (2009). A critical appraisal of

    guidelines for antenatal care: Components of care and priorities in prenatal education.

    Journal of Midwifery and Women's Health, 54 (6), 458-465.

Kowalski, W. J., Leef, K. H., Mackley, A., Spear, M. L., & Paul, D. A. (2006). Communicating

    with parents of premature infants: Who is the informant? *Journal of Perinatology*, 26,

    44-48.

Maloni, J.A. (2010). Antepartum bed rest for pregnancy complications: Efficacy and safety for

    preventing preterm birth. *Biological Research for Nursing*, 12 (2), 106-124.

    doi: 10.1177/1099800410375978

March of Dimes (2011). *Prematurity research: Finding cause of prematurity.* Retrieved from

    www.marchofdimes.com/research/prematurity

Mercer, B. M., Macpherson, C. A., Goldenberg, R. L., Goeofert, A. R., Haugel-De Mouzon, S.,

    Varner, M. W., . . . Spong, C. Y. (2006). Are women with recurrent spontaneous preterm

    births different from those without such history? *American Journal of Obstetrics &*

    Gynecology, 194 (4), 1176-1185. doi: 10.1016/j.ajog.2006.01.069

Mishel, M. H. & Clayton, M. F. (2008). Theories of Uncertainty in Illness. In Smith, M. J. &

    Liehr, P. R. (2nd Ed.), *Middle range theory for nursing* (pp. 55-84). New York, NY:

    Springer Publishing Company.

Orr, S. T., Reiter, J. P., Blazer, D. G., & James, S. A. (2007). Maternal prenatal pregnancy-

    related anxiety and spontaneous preterm birth in Baltimore, Maryland. *American*

    Psychosomatic Society, 69, 566-570.

Richter. M. S., Parkes, C., & Chaw-Kant, J. (2007). Listening to the voices of hospitalized high-risk antepartum patients. *Journal of Obstetrics, Gynecologic, and Neonatal Nursing,* 36 (4), 313-318.

Thorman, K. E., & McLean, A. (2006). While you are waiting: A family-focused antepartum support program. *Journal of Perinatal and Neonatal Nursing*, 20 (3), 220-226.

White, M. & Ritchie, J. (1984). Psychological stressors in antepartum hospitalization: Reports from pregnant women. *American Journal of Maternal-Child Nursing*, 3, 47-56.

Appendix A
Bill of Rights for Research Participants

As a participant in a research study, you have the right:

1. To have enough time to decide whether or not to be in the research study, and to make that decision without any pressure from those who are conducting the research.

2. To refuse to be in the study at all, or to withdraw from the study at any time.

3. To be told the purpose of the study and what you will be asked to do if you choose to participate.

4. To be told about the reasonably foreseeable risks of being in the study.

5. To be told about the possible benefits of being in the study.

6. To be told whether there are any costs associated with being in the study and whether you will be compensated for participating in the study.

7. To be told who will have access to information collected about you and how your confidentiality will be protected.

8. To be told whom to contact with questions about the research study and about your rights as a research subject.

9. If the study involves treatment or therapy:
    a. To be told about the other non-research treatment choices you have.

    b. To be told where treatment is available should you have a research-related injury, and who will provide payment for research-related treatment.

Appendix B

Perceived Stress Scale (PSS-10 HP) for Hospitalized Patients – 10 items
(adapted from Cohen, S., Kamarck, T., Mermelstein, R., 1983, for inpatient use)

Instructions: The questions in this scale ask you about your feelings and thoughts during your hospitalization. In each case, please indicate with circling the corresponding number for how often you felt or thought a certain way.

1. Since your hospitalization, how often have you been upset because of something that happened unexpectedly?

0 = never   1 = almost never   2 = sometimes   3 = fairly often   4 = very often

2. Since your hospitalization, how often have you felt that you were unable to control the important things in your life?

0 = never   1 = almost never   2 = sometimes   3 = fairly often   4 = very often

3. Since your hospitalization, how often have you felt nervous and "stressed"?

0 = never   1 = almost never   2 = sometimes   3 = fairly often   4 = very often

4. Since your hospitalization, how often have you felt confident about your ability to handle your personal problems?

0 = never   1 = almost never   2 = sometimes   3 = fairly often   4 = very often

5. Since your hospitalization, how often have you felt that things were going your way?

0 = never   1 = almost never   2 = sometimes   3 = fairly often   4 = very often

6. Since your hospitalization, how often have you found that you could not cope with all the things that you had to do?

0 = never   1 = almost never   2 = sometimes   3 = fairly often   4 = very often

7. Since your hospitalization, how often have you been able to control irritations in your life?

0 = never   1 = almost never   2 = sometimes   3 = fairly often   4 = very often

8. Since your hospitalization, how often have you felt that you were on top of things?

0 = never   1 = almost never   2 = sometimes   3 = fairly often   4 = very often

9. Since your hospitalization, how often have you been angered because of things that were outside of your control?

0 = never   1 = almost never   2 = sometimes   3 = fairly often   4 = very often

10. Since your hospitalization, how often have you felt difficulties were piling up so high that you could not overcome them?

0 = never   1 = almost never   2 = sometimes   3 = fairly often   4 = very often

Appendix C

Perinatal Data Collection Form

Patient # _____   Email Address _____

Phone Number _____   Address _____

Maternal Age _____   Gestational Age at Bed Rest _____

EDC   _____   Gestational Age at End of Bed Rest_____

Prenatal Complications_____

_____

_____

                              Primip_____Multip _____⇒ PTL? _____ Other_____

Estimated Fetal Weight & Sex (if known) _____

Date on Bed Rest _____

Date off Bed Rest _____

Total Length of Bed Rest: _____

_____

BIRTH OUTCOMES:

Gestational Age at Birth_____   Weight _____

NICU: YES   NO   Length of Stay in NICU: _____

Neonatal Complications: _____

_____

_____

Father Involved: YES   NO

Appendix D
Post-Delivery Maternal Survey (#_____)

1. How stressful did you feel your hospital stay was?

1	2	3	4	5
Minimal		Moderately		Very Stressful

2. How stressful did you feel your entire bed rest experience was?

1	2	3	4	5
Minimal		Moderately		Very Stressful

3. How helpful was the online support group? (if you participated in that aspect of the research study)

1	2	3	4	5
Minimal		Moderately		Very Helpful

4. How helpful was the information received about the NICU? (if applicable)

1	2	3	4	5
Minimal		Moderately		Very Helpful

5. How helpful was writing in the journal?

1	2	3	4	5
Minimal		Moderately		Very Helpful

6. How many NICU nurse or neonatologist visits did you receive while hospitalized?

7. Did you tour the NICU?   (Circle response)   YES   NO

8. How helpful was the tour?

1	2	3	4	5

Minimal   Moderately   Very Helpful

9. Is there anything you can think of that would have helped your hospital experience to be less stressful for you and/or your family? (add comments below or on back)

BIRTH OUTCOMES:

Gestational Age of your BABY at birth? _____

Weight of your BABY at birth? _____

Was your BABY admitted to the Neonatal Intensive Care Unit (NICU) after birth: (please circle)

YES   NO

How long did your BABY stay in NICU: _____

Did your BABY have any complications after birth?

_____