JCN Journal of Clinical Nursing

Journal of Clinical Nursing

REVIEW

Maternal risk during pregnancy: a concept analysis

Lucy R Van Otterloo and Cynthia D Connelly

Aims and objectives. To report an analysis of the concept of maternal risk and explore implications for practice using Walker and Avant's eight step method analysis.

Background. Although mortality during pregnancy is a relatively rare occurrence, serious maternal morbidities are increasingly present in today's pregnant population. Risk factors have been identified that increase the potential for morbidities and subsequent care modalities have been implemented to decrease this risk. However, despite the wide use of the term 'risk' in the medical and nursing literature, determining a common definition is difficult. Differences in the understanding of risk during pregnancy can hinder the ability to provide consistent and appropriate care.

Design. Concept analysis.

Methods. A search of the English literature was completed using the databases CINAHL, PubMed, Medline, and Google Scholar for years 2000–2014 using the keywords 'risk', 'maternal' and 'pregnancy'.

Results. Three defining attributes of risk were identified: chance of injury/loss, cognitive recognition and the decision-making processes. The antecedent of risk is the ability to understand the situation and cognitive ability to think about the potential consequences and adverse outcomes. Consequences of risk include the actual action taken as a result of the decision-making process.

Conclusion. This paper contributes to the understanding of risk allowing for the development of an individualised plan of care for each pregnant woman and empowering the nurse to advocate for appropriate care. Findings in this analysis assist nurses in bridging the gap in communication between the provider's and pregnant woman's interpretation of risk.

Relevance to clinical practice. The analysis of risk resulted in the identification of differences in perceptions of risk that can potentially result in miscommunication between provider and pregnant woman and increase the risk of inadequate or incomplete care.

What does this paper contribute to the wider global clinical community?

- For nurses in the perinatal arena, answers to the questions of who is at risk and how is it recognized provides the operational basis for appropriate risk-assessment of all pregnant women. A better understanding of maternal risk will allow for the formulation of care modalities specific to the needs of the population.
- Perinatal nurses are in a position to influence a pregnant woman's actions in recognizing her risk status through increased education. Once identified, at-risk pregnant women, providers, and delivery sites can be matched according to level of need, resources available, and capacity to provide risk-appropriate care.

Key words: concept analysis, maternal risk, maternity nursing, pregnancy

Accepted for publication: 6 March 2016

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Introduction

Pregnancy and birth, albeit a major life event, is a natural, developmental and physiological stage. Although the woman's body goes through extraordinary physical changes to adapt to the needs of the growing foetus, the majority of women do so without medical concern. For a small percentage of women, the changes that occur trigger a cascade of events that can lead to tragic results including maternal mortality and morbidity. Complications during pregnancy can pose a serious risk to both maternal and foetal health (Elixhauser & Wier 2011). Although the death of a woman during pregnancy or in the postpartum period is a relatively rare occurrence, the number of high-risk pregnancies due to maternal or neonatal complications has significantly increased over the past decade (Kuklina *et al.* 2009) leading to an increased number of adverse maternal health outcomes postdelivery. Among the 4·2 million deliveries in the USA in 2008, 94·1% listed some type of pregnancy complication (Elixhauser & Wier 2011). The American College of Obstetricians/Gynecologist (ACOG) and the Society of Maternal-Fetal Medicine Specialists (SMFM) recently published criteria (American College of Obstetricians and Gynecology/Society for Maternal Fetal Medicine 2015) for designating levels of maternal care that ensure the availability of appropriate resources that meet the health needs of the pregnant population, thereby reducing the risks associated with morbidity and mortality. The overall goal of risk-appropriate maternal care is to achieve optimal pregnancy and birth outcomes through early risk identification, and care in a setting appropriate for level of risk and transport when necessary. As such, much of the research in obstetrics has focused on finding answers to the questions of who is at risk and how does health care professionals recognise and minimise the effects of these risks. For nurses in the perinatal arena, answers to these questions provide the operational basis for appropriate risk assessment of all pregnant women.

Background

Although mortality during pregnancy is a relatively rare occurrence, serious maternal morbidities are increasingly present in today's pregnant population. Risk factors have been identified that increase the potential for morbidities and subsequent care modalities have been implemented to decrease this risk. However, despite the wide use of the term risk in the medical and nursing literature, determining a common definition is difficult. Risk has been defined by a variety of sources and used in an array of forums making a common understanding of the term difficult. To complicate matters, the term 'risk' has been used by several authors in conjunction with other important concepts including risk-taking (Weidel & Provencio-Vasquez 2008), risk-perception (Heaman *et al.* 2004, Slovic & Peters 2006, Lee *et al.* 2012, Bayrampour *et al.* 2013) and risk-communication (Cabeeza *et al.* 2005, Hampel 2006). Furthermore, with the heightened awareness of the consequences these potential risk factors present, pregnant women are assessed, usually at their first prenatal visit and throughout their pregnancy, to determine risk status (Smith *et al.* 2012). Pregnant women are subsequently referred to as low-, high- or even at- risk without a true understanding as to what defines that risk category. Consequently, clarity on what maternal risk actually is and how best to conceptualise it in maternity care remains elusive (Carolan 2008).

Maternal risk during pregnancy, therefore, is an important concept to further investigate and refine. To effect change and improve birth outcomes, it is critical to understand the meaning of risk as it pertains to pregnancy and nursing practice. How an individual defines risk during pregnancy can affect decisions on appropriate place and timing of birth, specific health behaviours that enhance birth outcome, and care utilisation including adequate prenatal care and appropriate medical treatment modalities (Lee *et al.* 2012, Bayrampour *et al.* 2013). A greater appreciation of risk is even more important in developing countries with higher maternal mortality rates (Ballard *et al.* 2013, Illah *et al.* 2013) or in diverse populations, where disparities in maternal adverse outcomes are more persistent (de Graaf *et al.* 2013). A better understanding of risk will allow the formulation of care plans specific to the needs of the population and assist nurses in bridging the gap in communication between the provider's and pregnant woman's interpretation of risk.

Aim and objectives

Therefore, the aim of this paper was to provide an analysis of the concept of risk in the context of pregnancy using strategies put forth by Walker and Avant (2011), to clarify the meaning of risk and to explore implications for future research of this concept. Walker and Avant's (2011) method of analysis was used to examine the concept of maternal risk. The authors outline eight steps in the process including selecting a concept; determining the aims or purpose of the analysis; identifying all uses of the concept that can be discovered; determining the defining attributes; identifying a model case; identifying borderline, related, contrary, invented, and illegitimate cases; identifying antecedent and consequences and defining empirical referents.

Methods

A search of the literature was completed using the databases CINAHL, PubMed, Medline, and Google Scholar for years 2000–2014 using the keywords 'risk', 'maternal' and 'pregnancy'. This search yielded over 8000 academic articles which highlight the frequent use of the term in medical and nursing literature. Medical and nursing literature is replete with the use of the term risk in referring to factors that increase/decrease the potential for adverse pregnancy outcomes, but do not define the term beyond its association with complications, such as morbidity or mortality. The search was further narrowed to include only those articles defining risk as a 'concept' or 'concept analysis'. After limiting the search to English language only, 137 articles were found. Abstracts were reviewed and the articles were further reduced to include only those that defined risk as the primary concept. The final total number of studies which met the inclusion criteria was 10 with three publications strictly addressing the concept of risk in women during pregnancy.

Results

Uses of the concept

The earliest use of the concept arose in the context of gambling during the 17th century as a neutral, predictable construct to mean the probability of an event occurring (Jacobs 2000). The act of gambling combines the probability of the occurrence with the potential loss or gain that results from it (Kettles 2004). Risk, evolving from the Latin – rescare, was further used in the French (risqué) and Italian (risicare) 18th Century Exploration Age to connote danger or peril when sailing into uncharted waters or daring to explore the world (Det Norske Veritas 2010). By the mid-19th century, public health and epidemiology were developed to estimate risk and implement strategies to eradicate or minimise factors that increase that risk and as such the concept of risk currently refers to negative consequences (Jacobs 2000, Kettles 2004). Health care continues to analyse these risks to estimate or predict the probability of an event occurring to determine the potential loss or gain from actions taken or not taken (Palmer *et al.* 2005). This particular definition is used frequently when weighing the benefits of a mode of treatment against its potential unfavourable outcome (risk-benefit analysis). Illness prevention strategies are often based on identifying and reducing the consequences of these risk factors.

The concept of risk is a common thread in many other disciplines and industries including economics, administration, legal and theology (Gregersen 2003, Knighton 2004, Hull 2009). Overall, the shared theme among all these arenas has a negative connotation associated with injury, damage, loss or harm. O'Byrne (2008), however, states that risk is not always associated with adverse outcomes as risk may be the motivator for change that leads to a positive outcome. Decision-making and the influence an understanding of risk has on it can alter the ultimate effect of the potential consequences.

Unfortunately, obstetric risk differs in its construct depending on the usage of the term. Understanding of the concept of maternal risk during pregnancy varies between providers and pregnant women, as well as among providers themselves and is dependent on the individual's experience, perception and beliefs. For the pregnant woman, coping strategies, the context in which the risk occurs, and previous life experiences play a larger role in influencing her perception of risk than does the statistical probabilities used by health care providers (Heaman *et al.* 2004, Carolan 2008). Health care providers also evaluate and treat maternal risk based on their own knowledge base, experiences and comfort level. When differences in the interpretation of risk occur between the pregnant woman and provider, issues of trust, compliance and satisfaction with care begin to surface. Differences in interpretation of risk can potentially result in miscommunication between provider and the pregnant woman, and increase the threat of inadequate or incomplete care (Lee *et al.* 2012, Bayrampour *et al.* 2013).

Defining attributes

The defining attributes are the characteristics that are most frequently associated with the concept in the literature (Walker & Avant 2011). The defining attributes of maternal risk are the chance of injury/loss, a cognitive recognition of these chances, and the decision-making processes that come from a thoughtful analysis of the potential losses and the probability that losses will occur (Cabeeza *et al.* 2005, Fishbein 2008, Chuang *et al.* 2010, MacKenzie-Bryers & van Teijlingen 2010). Many recent studies of pregnant women have focused attention on identifying risk factors during pregnancy that increase the chance of maternal mortality and morbidity including age (Cleary-Goldman *et al.* 2005), ethnicity (Callaghan *et al.* 2008), drug-use (Kennare *et al.* 2005), obesity (Mamun *et al.* 2011), and obstetric or medical complications (Kuklina *et al.* 2009, Gray *et al.* 2012, Campbell *et al.* 2013). The presence of maternal disease significantly increases the odds of maternal mortality at the time of birth hospitalisation (Campbell *et al.* 2013). Pregnant women as well as providers take these odds into consideration when determining whether or not they pertain

to the situation at hand and whether or not actions need to be taken to prevent and/or minimise those risks. Pregnant women may consider previously acceptable risks, unacceptable because of the foetus she is carrying. Health care providers equally may consider actions unnecessary if in similar circumstances the potential for injury/loss was inconsequential. Individuals therefore consider these risks when determining a course of action or inaction (Alaszewski & Horlick-Jones 2003, Hampel 2006). Health care professionals also judge the potential for adverse outcomes when implementing interventions to prevent or minimise injury or loss (MacKenzie-Bryers & van Teijlingen 2010). A delay in or failure to recognise a pregnant woman's chance for an adverse outcome increases the potential for missed opportunities for prevention of maternal morbidity and mortality (Geller *et al.* 2004, Lawton *et al.* 2014). Beliefs and attitudes about the likelihood or degree of harm occurring plays a large part in how health care providers' and pregnant women make decisions (Heaman *et al.* 2004, Lee *et al.* 2012, Bayrampour *et al.* 2013). Both entity's perception and response to risk is influenced and controlled by previous experiences and the setting in which the risk occurs (Possamai-Inesedy 2006). Personal, professional and past experiences play pivotal roles in how maternity care is provided and received (Smith *et al.* 2012). Finally, decision-making processes, i.e. development of a plan of care, are based on the determination of the level of risk. Risk assessment is the process of 'screening for conditions that could result in adverse outcomes and where an intervention would improve the health outcome' (MacKenzie-Bryers & van Teijlingen 2010, p. 492). With maternal risk, decisions are made on the probability that potential injuries or losses may come about and establishing what needs to be implemented to alter the situation or in cases of no or low risk, maintain the status quo. Both the pregnant woman and the health care provider consider these probabilities when determining actions needed. It is important to note, that the decision-making process is not a physical action, but the mental act of analysis and planning.

Model case

Walker and Avant (2011) define model cases as those examples of the concept that demonstrate all the defining attributes. The following model cases display the chance of injury or loss, the recognition these chances exist, and the decision-making processes involving the potential benefit and harm:

M.V. is a 36-year old primiparous woman who arrives on the labor and delivery unit at 28 weeks gestation. She is complaining of headache and epigastric pain and is concerned about the welfare of the baby. The nurse places the patient on external fetal monitoring, obtains her vital signs, and checks her urine for protein. Her blood pressure is 170/98 and 2+ proteinuria is noted on urine dipstick. The fetal baseline is 120 bpm. Despite stabilization attempts including administration of magnesium sulfate and acetaminophen, M.V.'s blood pressure is 185/107 and her headache is worsening. The nurse identifies the potential for eclampsia and subsequent fetal hypoxia. She quickly recognizes the fact the facility does not have the capability to perform appropriate resuscitation measures including adequate blood products, emergency cesarean section, and obstetric critical care. She contacts the laborist to discuss potential transfer of the woman to a higher level facility. After assessing the patient, the laborist agrees with the transfer and arrangements are made to transfer to a tertiary center. M.V., however, does not want to be transferred to another facility as this was the facility she had chosen for her birth experience and where her sister delivered her three children without any problems. M.V. states that she has had these headaches throughout her pregnancy and has felt stressed at work. She indicates that she ate pizza last night for dinner and has experienced indigestion because of it. The nurse as well as M.V.'s physician discusses the situation with M.V. and her husband, providing information on her declining status and the potential adverse outcomes for both her and her fetus. After some time to process the situation, M.V. and her husband agree that this is best for their family. The nurse reassures them that she will stay with them to ensure that the transition is smooth.

The model case demonstrates the attributes of maternal risk through the chance of harm to the mother related to the classic symptoms of preeclampsia and the possible eclamptic seizure, recognition of these triggers by the nurse, and an understanding of the facility's inability to support the needs of a pre-eclamptic pregnant woman thus increasing the potential for harm and the need for consultation based on weighing the possibilities. The decision-making process is based on the recognition that injury or harm is possible and this recognition of risk guides the next steps. It further illustrates the difference between nursing and the pregnant woman's perception of these attributes. The nurse, understanding the potential for harm based on symptom recognition, immediately assesses the hospital's capability for risk-appropriate care and determines a lack of required resources and takes steps to meet the needs of the pregnant woman. The pregnant woman, on the other hand, assesses the potential for risk as minor because of previous known experiences and doubts regarding severity of illness. Education and support are important factors to mutual understanding and a unified decision-making process. Facilitated learning allows the woman and her family to be fully aware of their changing situation and take part in the decisions moving forward.

This model case also highlights the transition from low-risk to high-risk pregnant. When previously low-risk women become high-risk during their pregnancy, labor, or birth a period of adjustment occurs before they can begin the decision-making process. Sudden changes in the course of pregnancy can cause anxiety. The added stressors that incur can affect her risk-perception and requires additional supportive measures (Hammer & Burton-Jeangros, 2013).

Additional cases

Providing borderline, related, and contrary cases allows one to clarify what the concept is like, what the concept is similar to, and what the concept is not (Shattell 2004). The following borderline case is an example where some, but not all of the defining attributes are present. In this case, the first critical attribute of chance for injury is present (haemorrhage and pulmonary embolism), but the nurse did not recognise the symptoms of respiratory distress therefore making the decision for in-action. Notably, despite triggers that clearly indicated a serious deterioration in the patient's condition, health care providers failed to recognize and respond to these signs in a timely manner leading to delays in diagnosis and treatment (Lawton *et al.* 2014):

J.G, a 41-year old Spanish speaking multiparous woman, has a precipitous delivery of a 9 lb 1 oz baby boy. There is heavy bleeding immediately following the birth, but this is controlled by external massage of the uterus and medications. The baby is placed skin-to-skin with the mother and breastfeeding is begun shortly thereafter. One hour later the patient is restless and short of breath. The nurse performs a fundal check to assess for uterine atony with minimal lochia noted. She instructs the patient to relax and take deep breaths. Due to language barriers the patient is unable to respond and the nurse takes her silence as understanding. No further action is taken.

The following related case is an example where similarities between this and the model case are present, but the defining attributes are absent (Walker & Avant 2011). Related cases shed light on concepts that may be used incorrectly in place of the concept of risk. The concept of uncertainty is similar as many potential outcomes are present, but the chance of loss or injury is not. Uncertainty can add new stressors to the mother that can adversely affect her coping mechanisms throughout her pregnancy and labour and inhibit her ability to bond with her foetus and/or newborn (White *et al.* 2008):

A.J., a pregnant primiparous woman with no previous medical history, comes to labor and delivery at 31 weeks with regular contractions. Her cervical exam indicates she has not dilated and the fetal fibronectin test is negative. Since she continues to have irregular contractions, her health care team is uncertain whether these contractions will eventually cause cervical change. She is admitted to the antepartum unit for further observation. A.J. is concerned and anxious about the prognosis of her pregnancy and status of the newborn if birth is imminent.

In this case, although the pregnant woman is experiencing symptoms of preterm labour, her assessment indicates no chance of injury/loss at this time. Unfortunately, because the health care team did not recognise this, A.J. was admitted substantiating her fears regarding preterm birth. A contrary case provides clarity regarding what the concept is not (Walker & Avant 2011). In this example, none of the defining characteristics are present and it is clear that no chance of harm/injury is recognisable:

R.D., a 31 y.o. primigravida, enters into prenatal care at 8 weeks of gestation. Although she perceives herself to be healthy, she is concerned about diabetes as her mother has Type II diabetes and had gestational diabetes during her pregnancies. She is aware of the causes of diabetes and has altered her diet to include more fresh fruits and vegetables with limited refined surgars. Her pre-pregnancy BMI was 27 and she continues to engage in moderate exercise at least 3 times per week. Although R.D. has a family history of diabetes she is taking measures to prevent having the condition through a healthy lifestyle.

Antecedents and consequences

Walker and Avant (2011) define antecedents as events or incidents that occur prior to the concept and consequences as those events or incidents that occur as a result of the concept. The antecedent to the concept of risk is the ability to understand the situation and cognitive ability to think about the potential consequences and adverse outcomes (Slovic & Peters 2006). If a pregnant early adolescent woman does not know the signs of preterm labour, she is unable to understand the likelihood of a preterm birth. Due to her cognitive developmental stage as a concrete thinker, she has minimal ability to see herself in the future (Ladewig *et al.* 2009). Therefore, capacity for cognitive reasoning is an antecedent of risk. Prior experiences of the event or incident are also necessary to risk. A nurse who has never dealt with or learnt about pulmonary embolism may not recognise the signs and therefore delays intervention. In order for there to be recognition of the potential harm and an adequate decision-making process the individual must have the capability for understanding whether this is gained through education or experience (Fishbein 2008). Finally, there must

be something of value at stake for a risk to exist (McNeill 2014). Maternal death and severe maternal morbidity related to pregnancy are driving forces behind changes in health care practices today including appropriate assessment for the presence of risk and standardised, evidence-based actions to prevent or at the very least minimise adverse outcomes. It is these outcomes that make maternal risk a reality. Finally, the degree of importance the pregnant woman places on risk during pregnancy can determine her response to the concept of risk. Hammer and Burton-Jeangros (2013) noted that low-risk pregnant women vary in how they interpret and deal with the potential for risk. The level of importance they place results in varying degrees of anxiety and tension and therefore effects their decisions regarding care. Although all the women in the study were concerned about their pregnancy outcomes, their feelings ranged from little anxiety due to their trust in their health care professionals or a commitment to enjoying their pregnancy regardless of risk to extreme anxiety related to the knowledge that adverse outcomes are always a possibility and therefore must actively be controlled. The authors further noted pregnant women's attitudes to this risk discourse influence their actions. These actions range from taking steps to eliminate the risk potential to keeping their distance from the medical model of care.

Consequences of maternal risk include the actual action or inaction taken as a result of the decision-making process. In the model case provided earlier, the nurse discussed the situation with the physician and patient and after some dialogue the decision for transfer to a higher level of care was made. The consequence was the actions taken to prevent, modify or minimise the risk. Recommendations for transfer of high-risk mothers to facilities more equipped and prepared to care for them have been shown to reduce perinatal morbidity and mortality (Mostello *et al.* 2003, Wright *et al.* 2010, Binder *et al.* 2011). Inaction is also a consequence of risk. If the physician chose not to transfer the mother, the pregnancy could have terminated in a caesarean section after an eclamptic seizure with both mother and newborn admitted to the intensive care unit. Therefore, the value of the understanding of risk lies in its consequence and the belief that actions can be taken to prevent or decrease the effects of risk whether real or perceived (McNeill 2014).

Empirical referents

Empirical referents are examples of actual phenomena that indicate the presence of the concept of interest (Walker & Avant 2011). It is the means by which the concept is identified and measured. The measurement of risk is threefold; risk assessment, recognition of provider/facility capabilities to provide for needs, and measures of behaviours that determine appropriate decision-making processes. First, the presence or absence of risk must be determined. This is usually done by the use of risk assessment (Gibson *et al.* 2001). If the phenomena, event or condition does not possess the potential for harm or injury, then risk is not present. On the other hand, if an adverse outcome is possible, then a level of risk is present. The more likely the possibility of an adverse outcome occurring, the higher the risk. In perinatal health care, women should be assessed at their first prenatal visit and periodically throughout their pregnancy, labour and delivery for the presence of risk factors that increase the chance for adverse outcome, predominately injury to the woman or her newborn. Interventions are then implemented to prevent or minimise the consequences of risk (Samuelson *et al.* 2002). Second, risk is measured by the ability of the provider/facility to recognise and treat the risk through improved education or experience. Negative consequences often occur because of delayed identification, inappropriate or no communication, and delayed action. These consequences can often be prevented when health care providers are appropriately educated to meet the unique needs of the pregnant population they serve (Murray & Pearson 2006). Finally, if a risk is present, determination of the presence of appropriate resources and the ability to provide the required care must be taken into consideration when deciding on a course of action (Warner *et al.* 2004).

Discussion

The presence of risk is a common phenomenon in the health care arena. To improve the outcomes of pregnancy, nurses must be involved in the decision-making process around risk and develop evidence-based guidelines for levels of care specific to obstetric patients. A thorough understanding of risk allows for the development of an individualised plan of care for each pregnant woman and empowers the nurse to advocate for risk-appropriate care. Many times, nurses are the first line of defence in assessing for risk and preventing adverse outcomes. Accurate and complete documentation regarding obstetric and medical comorbidities, as well as assessment findings must be communicated to the health care provider promptly and assertively. Identification tools, educational programs and screening strategies can assist nurses in identifying risk factors and preventing potential medical complications of high-risk pregnant women. The earlier and more complete the assessment of risk the better

appropriate care services can be matched with the patient along the continuum of care. Hospitals need to develop guidelines for systematic identification of women at risk for adverse outcomes and ensure the availability of appropriate resources required to provide care. Policies that support recommended criteria for transport and enhanced communication between referring and receiving facilities must be instituted. Collaboration and communication between nurses in the obstetric department and the intensive care unit ensure prompt response to emergencies.

Perinatal nurses should partner with a pregnant woman to facilitate learning and support her in recognizing her risk status. The perinatal nurse can encourage the woman to take an active role in her pregnancy, to improve her awareness of early signs of complications, and to access appropriate services thus improving overall outcome. In addition, with an increasing number of women deemed at risk, it is important for nurses to understand and respond to the pregnant woman's comprehension of risk, as well as assess maternal psychosocial/familial needs to minimise concerns surrounding the plan of care. Once identified, at-risk pregnant women, providers, and delivery sites can be matched according to level of need, resources available and capacity to provide risk-appropriate care.

Limitations

There are several limitations to this analysis. Risk, although often used, is not universally understood in nursing. Various meanings are seen in the literature depending on the phenomena under study making analysis of the term equally elusive. In addition, the search terms used may have limited the scope of analysis due to its narrow focus on maternity and pregnancy. Risk in pregnancy is often viewed differently as these factors may have varying effects on the mother, the foetus, the newborn and/or the family. Decisions based on probability of injury or harm is dependent on which individual member of the group is in jeopardy. The narrow focus on one population this analysis took may limit the generalisability of its findings.

Conclusion

This article provides an analysis of the concept of maternal risk during pregnancy. Cases were described to provide context to the defining attributes of the concept. These findings are particularly relevant as each day nurses use their knowledge and skills to identify potential factors that may cause injury or harm to the pregnant woman. The earlier these aspects are recognised the better the nurse can initiate the decision-making process to ameliorate the risk. Understanding risk can help nurses identify who is at risk and how to intervene to remove or minimise these risks. The overall goal is to achieve optimal pregnancy outcomes through early risk identification, care in a setting appropriate for the level of risk, and transport if necessary to reduce the adverse consequences of risk (Pasquier *et al.* 2005). Health care professionals must work together to define maternal levels of care and develop guidelines for consistent implementation of practice standards to maintain an effective system of care that minimises maternal-foetal risk.

Relevance to clinical practice

- For nurses in the perinatal arena, answers to the questions of who is at risk and how it is recognised provides the operational basis for appropriate risk assessment of all pregnant women. A better understanding of maternal risk will allow for the formulation of care modalities specific to the needs of the population.
- Perinatal nurses are in a position to influence a pregnant woman's actions in recognising her risk status through increased education. Once identified, at-risk pregnant women, providers and delivery sites can be matched according to level of need, resources available and capacity to provide risk-appropriate care.

Contributions

Study design: LVO; Data collection and analysis: LVO; Manuscript preparation: LVO and CDC.

Funding

This analysis received funding from the University of San Diego Nursing PhD Dean's Scholar Award and the Doris A. Howell Foundation Research Award.

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