

Nursing Interventions for Early Identification and Prevention of Complications in High-Risk Pregnancies

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Abstract—Background

High-risk pregnancy is a significant public health concern associated with increased maternal and neonatal morbidity and mortality. In India, approximately 49.4% of pregnancies are categorized as high risk, with Karnataka reporting prevalence rates ranging from 15.3% to 61.6%. Early identification and timely management of high-risk pregnancies are essential to prevent adverse maternal and fetal outcomes. Nurses play a pivotal role in risk assessment, monitoring, counseling, and implementation of preventive interventions.

Objectives

1. To review the importance of early identification of high-risk pregnancies.
2. To describe nursing interventions for preventing complications in high-risk pregnancies.
3. To highlight the role of nurses in improving maternal and neonatal outcomes.
4. To discuss evidence-based strategies for management and prevention of complications associated with high-risk pregnancies.

Method

A narrative review approach was adopted using published literature, national guidelines, government reports, and international recommendations related to high-risk pregnancy management, nursing interventions, and maternal health outcomes. Relevant data were collected from scientific articles, WHO guidelines, NFHS reports, and maternal health publications.

Results

The review revealed that early risk assessment, regular antenatal care, maternal education, nutritional support, fetal surveillance, timely referral, and multidisciplinary management significantly reduce pregnancy-related complications. Nursing interventions such as antenatal screening, counseling, monitoring of maternal and fetal well-being, health education, and promotion of healthy lifestyle practices contribute substantially to reducing maternal and neonatal morbidity and mortality.

Simulation-based training and standardized clinical protocols further enhance nurses' clinical decision-making abilities.

Conclusion

Early identification and prevention of complications in high-risk pregnancies require comprehensive, evidence-based nursing care. Nurses serve as frontline healthcare providers in recognizing risk factors, implementing preventive measures, and facilitating timely referrals. Strengthening nursing competencies and promoting standardized maternal healthcare practices can improve pregnancy outcomes and contribute to safer motherhood.

Index Terms—High-risk pregnancy, Nursing interventions, Early identification, Maternal health, Antenatal care, Pregnancy complications, Risk assessment, Fetal surveillance, Maternal mortality, Neonatal outcomes.

I. INTRODUCTION

Clinical decision-making in obstetrics is the continuous, evolving process by which maternity healthcare professionals gather, interpret, and evaluate clinical data to make evidence-based choices that ensure maternal and neonatal safety.¹The ability to apply advanced theoretical knowledge to dynamically changing clinical contexts, allowing clinicians to synthesize data like fetal heart rate tracings and maternal vital signs.² Utilizing established clinical protocols, guidelines, and risk-stratification metrics to back up choices of interventions³. Relying on cognitive patterns derived from cumulative past clinical exposure, which helps expert practitioners recognize complications quickly⁴. Multiple regional studies indicate that upwards of 30-40% of nurses lack complete confidence or

mastery in managing complex, multi-system obstetric emergencies without immediate physician oversight. Pilot studies in low-resource settings show that simulation-based training increases obstetric nurse and midwife competencies by over 20-30%, resulting in vastly improved management of gestational diabetes and hypertensive disorders. Studies exploring Tacit Risk Management emphasize the need to understand how nurses process risk in uncertain conditions to improve training modules⁵. While there is no single, state-wide census on obstetrical nurses' decision-making capabilities in Karnataka, various localized studies and health-outcome reports provide critical insights. The prevalence of high-risk pregnancies in Karnataka ranges between (18.8%) to as high as (61.6%) depending on the region, making nursing proficiency in this area vital⁶. National Family Health Survey data indicates that the prevalence of high-risk pregnancies among Indian women is roughly (49.4%). In Karnataka, taluk-level and district-level studies generally report a high-risk prevalence rate between (15.3%) and (61.6%)⁷. The most commonly identified risk factors driving these numbers in Karnataka include hypothyroidism, pregnancy-induced hypertension (PIH), previous lower segment cesarean sections (LSCS), and severe anemia⁸. Many field-level nurses demonstrate a good theoretical baseline regarding general antenatal care (ANC) screening, but they often struggle with acute, time-sensitive decision-making⁹. In assessments of specific obstetrical emergencies, nurses exhibit gaps in identifying precise intravenous fluid choices during eclampsia or administering accurate life-saving medications on the¹⁰ □ Focuses on the systematic identification and follow-up of high-risk pregnancies through specialized ANC services.¹¹ Government and private institutions are increasingly focusing on standardized simulation-based programs (similar to Advanced Life Support in Obstetrics or BLSO) to bridge the gap between theoretical knowledge and real-time clinical decisions.¹² Rural initiatives in Northern Karnataka have shown that leveraging simple point-of-care digital diagnostics and standardized protocols drastically assists staff nurses and community health workers in making timely risk-stratified decisions.¹³

Definition: A high-risk pregnancy is one that poses greater-than-average health challenges for the

mother, the fetus, or both. These pregnancies require closer monitoring and specialized care to help prevent or manage complications.¹⁴ A high-risk pregnancy is defined as one which is complicated by factors that adversely affect the pregnancy outcome and safe delivery process – maternal or perinatal or both.¹⁵

Prevalence: The prevalence of high-risk pregnancy (HRP) in India is reported to be 49.4%, based on the analysis of National Family Health Survey-5 (NFHS-5) data. Among these, 33.0% of pregnant women had a single high-risk factor, while 16.4% had multiple high-risk factors.¹⁶ In Karnataka, studies have reported that approximately 30–35% of pregnancies are classified as high risk, although prevalence varies across districts depending on maternal age, anemia, hypertension, diabetes, and obstetric complications.¹⁷ Specific district-level data on the prevalence of high-risk pregnancy in Bagalkot are limited. However, Bagalkot is recognized as a district with significant maternal health challenges,¹⁸ including early marriage, anemia, and other obstetric risk factors, suggesting a substantial burden of high-risk pregnancies¹⁹.

II. CONTRIBUTION

The proposed study on “Nursing Interventions for Early Identification and Prevention of Complications in High-Risk Pregnancies” is expected to contribute significantly to maternal and fetal health outcomes. The findings will help nurses identify high-risk pregnancies at an early stage, promote timely interventions, and prevent pregnancy-related complications. The study will strengthen the role of nurses in antenatal care by enhancing their knowledge and skills in risk assessment, monitoring, counseling, and referral services.²⁰

The study may assist healthcare institutions in developing evidence-based nursing protocols and guidelines for managing high-risk pregnancies. Early detection and appropriate nursing interventions can reduce maternal morbidity, mortality, and adverse neonatal outcomes such as preterm birth, low birth weight, and perinatal complications.²¹

Furthermore, the findings can be utilized for nursing education, clinical practice, administration, and future research. The study may also support policymakers in planning maternal health programs

aimed at improving the quality of antenatal services and achieving better maternal and child health indicators.²²

III. EARLY DIAGNOSIS OF HIGH-RISK PREGNANCY

Early diagnosis of high-risk pregnancy is essential for identifying maternal and fetal risk factors at the earliest stage and implementing appropriate interventions to prevent complications. Regular antenatal assessment, screening, and monitoring help in the timely detection of conditions such as hypertension, gestational diabetes mellitus, anemia, multiple pregnancy, and fetal growth abnormalities. Early identification enables healthcare providers to initiate preventive measures, provide specialized care, and improve maternal and neonatal outcomes.²³

Nurses play a crucial role in the early diagnosis of high-risk pregnancies through comprehensive antenatal assessment, risk screening, health education, counseling, and timely referral. Early diagnosis and management have been shown to reduce maternal morbidity, mortality, preterm birth, low birth weight, and other adverse pregnancy outcomes.²⁴

IV. SYMPTOMS OF HIGH-RISK PREGNANCY

Women with high-risk pregnancies may experience various warning signs and symptoms that require immediate medical attention. Common symptoms include severe headache, blurred vision, swelling of the face and hands, persistent vomiting, vaginal bleeding, reduced fetal movements, abdominal pain, leakage of amniotic fluid, high fever, and difficulty in breathing. These symptoms may indicate serious complications such as preeclampsia, gestational hypertension, placental abnormalities, preterm labor, or fetal distress.²⁵

Early recognition of these symptoms and prompt healthcare intervention can significantly reduce maternal and fetal complications. Pregnant women should be educated to report any danger signs immediately during the antenatal period to ensure timely diagnosis and management.²⁶

V. MANAGEMENT OF HIGH-RISK PREGNANCY

The management of high-risk pregnancy aims to identify risk factors early, prevent complications, and ensure the best possible maternal and fetal outcomes. Effective management requires a multidisciplinary approach involving obstetricians, nurses, dietitians, and other healthcare professionals.²⁷

1. Early Risk Assessment and Screening

Comprehensive assessment should be performed during the first antenatal visit and throughout pregnancy to identify maternal, fetal, and obstetric risk factors. Screening includes blood pressure monitoring, hemoglobin estimation, blood glucose testing, ultrasonography, and assessment of previous obstetric history.^{27,28}

2. Regular Antenatal Care

Frequent antenatal visits facilitate continuous monitoring of maternal and fetal well-being. Regular examinations help detect complications such as preeclampsia, gestational diabetes, anemia, fetal growth restriction, and preterm labor at an early stage.²⁷

3. Nutritional Management

A balanced diet rich in proteins, iron, folic acid, calcium, vitamins, and minerals is essential. Nutritional counseling should be provided to prevent maternal anemia, malnutrition, and fetal growth abnormalities.²⁹

4. Health Education and Counseling

Pregnant women and family members should receive education regarding danger signs of pregnancy, medication adherence, nutrition, personal hygiene, stress management, birth preparedness, and the importance of regular antenatal visits.²⁸

5. Medical Management

Management depends on the underlying risk condition. Antihypertensive drugs may be prescribed for hypertension, insulin or oral hypoglycemic agents for gestational diabetes, iron supplements for anemia, and other medications as indicated. Treatment should be individualized according to maternal and fetal needs.^{27,30}

6. Fetal Surveillance

Regular fetal monitoring is essential to assess fetal growth and well-being. Methods include ultrasonography, fetal movement counting, non-stress tests, biophysical profile assessment, and Doppler studies when indicated.³⁰

7. Timely Referral and Hospitalization

Women with severe complications such as severe preeclampsia, antepartum hemorrhage, uncontrolled diabetes, or preterm labor may require referral to higher centers and hospitalization for specialized care.²⁸

8. Delivery Planning

The timing and mode of delivery should be planned according to maternal and fetal conditions. High-risk pregnancies often require careful intrapartum monitoring and availability of emergency obstetric and neonatal services.²⁷

9. Postnatal Follow-Up

Continuous monitoring after delivery is important to detect postpartum complications and ensure maternal and newborn well-being. Counseling regarding family planning, nutrition, breastfeeding, and follow-up care should be provided.²⁹

VI. COMPLICATIONS OF HIGH-RISK PREGNANCY

High-risk pregnancy is associated with an increased likelihood of maternal, fetal, and neonatal complications. If not identified and managed promptly, these complications can lead to significant morbidity and mortality.

Maternal Complications

- Gestational hypertension and preeclampsia
- Eclampsia
- Gestational diabetes mellitus
- Antepartum hemorrhage (placenta previa, placental abruption)
- Anemia
- Preterm labor
- Infections and sepsis
- Postpartum hemorrhage
- Maternal morbidity and mortality

Fetal and Neonatal Complications

- Intrauterine growth restriction (IUGR)
- Low birth weight (LBW)
- Preterm birth
- Fetal distress
- Congenital anomalies
- Stillbirth and intrauterine fetal death
- Birth asphyxia
- Neonatal intensive care unit (NICU) admission
- Increased neonatal morbidity and mortality

Early identification of risk factors and appropriate antenatal, intrapartum, and postnatal management can significantly reduce these complications and improve maternal and neonatal outcomes.^{31,32}

VII. PREVENTION OF COMPLICATIONS IN HIGH-RISK PREGNANCY

Prevention of complications in high-risk pregnancy focuses on early identification of risk factors, regular antenatal care, health education, and timely medical intervention. Appropriate preventive measures can significantly reduce maternal and neonatal morbidity and mortality.³³

Preventive Measures

- Early registration of pregnancy and regular antenatal check-ups for timely detection of complications.
- Risk assessment and screening for hypertension, diabetes mellitus, anemia, infections, and other medical conditions during each antenatal visit.
- Balanced nutrition with adequate intake of iron, folic acid, calcium, proteins, and vitamins to promote maternal and fetal health.
- Compliance with prescribed medications and supplements to prevent anemia and other pregnancy-related complications.
- Monitoring of blood pressure, blood glucose levels, and fetal growth throughout pregnancy.
- Health education and counseling regarding danger signs of pregnancy, personal hygiene, stress management, and birth preparedness.
- Immunization, especially tetanus-containing vaccines, as recommended during pregnancy.
- Avoidance of harmful substances such as tobacco, alcohol, and non-prescribed medications.
- Timely referral and specialized care for women identified with high-risk conditions.

- Regular fetal surveillance through ultrasonography and other recommended investigations to detect fetal complications early. Effective implementation of these preventive strategies helps ensure safe motherhood and improves both maternal and neonatal outcomes.³³

VIII. NON-PHARMACOLOGICAL MANAGEMENT OF HIGH-RISK PREGNANCY

Non-pharmacological management plays an important role in reducing complications and promoting maternal and fetal well-being in high-risk pregnancies. These interventions focus on lifestyle modification, health education, monitoring, and supportive care.³¹

1. Nutritional Management

- Consume a balanced diet rich in proteins, iron, folic acid, calcium, vitamins, and minerals.
- Increase intake of fruits, vegetables, whole grains, and adequate fluids.
- Avoid excessive intake of salt, sugar, and processed foods.

2. Adequate Rest and Sleep

- Ensure 8–10 hours of sleep at night.
- Take adequate rest periods during the day.
- Left lateral positioning is recommended to improve uteroplacental blood flow.

3. Regular Physical Activity

- Engage in moderate exercise such as walking, prenatal yoga, and stretching exercises as advised by healthcare providers.
- Avoid strenuous activities and heavy lifting.

4. Stress Reduction and Emotional Support

- Practice relaxation techniques such as deep breathing, meditation, and mindfulness.
- Encourage family support and participation in antenatal care.
- Seek counseling when needed to reduce anxiety and emotional stress.

5. Health Education

- Educate pregnant women regarding danger signs such as vaginal bleeding, severe headache, blurred vision, reduced fetal movements, and swelling of the face and hands.
- Promote adherence to antenatal appointments and recommended investigations.

6. Self-Monitoring

- Monitor fetal movements daily.
- Maintain records of weight gain and antenatal visits.
- Report abnormal symptoms immediately to healthcare providers.

7. Lifestyle Modification

- Avoid tobacco, alcohol, and substance abuse.
- Maintain personal hygiene and infection-prevention measures.
- Ensure a healthy and safe home environment.

8. Regular Antenatal Follow-Up

- Attend scheduled antenatal visits for early detection of maternal and fetal complications.
- Undergo recommended screening and diagnostic tests.

Non-pharmacological interventions complement medical treatment and contribute significantly to preventing complications, improving maternal health, and enhancing fetal outcomes in high-risk pregnancies.^{32,33}

IX. CONCLUSION

High-risk pregnancy is a major public health concern that can adversely affect maternal and fetal outcomes if not identified and managed appropriately. Early risk assessment, regular antenatal care, timely diagnosis, effective nursing interventions, and appropriate preventive measures are essential for reducing complications and improving pregnancy outcomes.³⁴ Non-pharmacological strategies such as proper nutrition, adequate rest, stress management, health education, and regular follow-up further contribute to maternal and fetal well-being.³⁵ Through comprehensive and evidence-based care, healthcare professionals, particularly nurses, play a crucial role in promoting safe motherhood and reducing maternal and neonatal morbidity and mortality³⁵

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