

Internship Training

At

UNICEF

A report on

**“The trends of Maternal Complications During Pregnancy on
Maternal and Fetal Outcomes”**

By

Pranav Gupta

PG/22/075

Under the guidance of

Dr. Vinay Tripathi

PGDM (Hospital and Health Management)

2022-24



**International Institute of Health Management Research
New Delhi**

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**International Institute of Health Management Research
New Delhi**

The certificate is awarded to

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in recognition of having successfully completed his internship in the department of

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He comes across as a committed, sincere & diligent person who has a strong drive & zeal for learning.

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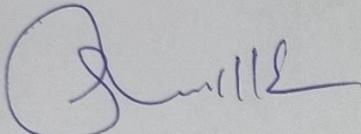
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Associate Dean, Academic and Student Affairs

IIHMR, New Delhi



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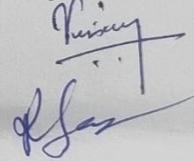
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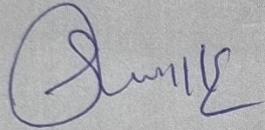
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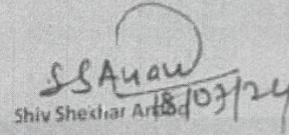
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Attendance: *15th February to 15th May 2024*

Objectives achieved: *- YES.*

Deliverables: *- YES*

Strengths: *- Suggestive attitude and good learner*

Suggestions for Improvement: *- Required more focus on new
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Sincerely,

Pranav Gupta

PG/22/075

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Abstract

This study investigates the trends of maternal complications during pregnancy and their impact on maternal and foetal outcomes over a three-month period at a sub-divisional hospital in Purnia district. Maternal complications, such as gestational diabetes, young age, preeclampsia, anaemia, hypertensive disorders, and infections, are significant factors that can adversely affect pregnancy outcomes. These complications can lead to a range of issues, including preterm birth, low birth weight, foetal growth restriction, and increased maternal morbidity and mortality. The research focuses on analysing the prevalence, risk factors, and outcomes associated with these complications by examining patient records and clinical data from the hospital.

The study aims to identify patterns in the occurrence and progression of maternal complications and to evaluate their short-term and long-term effects on both maternal and foetal health. The findings reveal a high prevalence of hypertensive disorders among the study population, with significant adverse foetal outcomes such as preterm births and low birth weights. Notably, the study identifies a high incidence of postpartum haemorrhage (PPH) as a critical maternal complication, significantly impacting maternal health outcomes. The analysis also highlights the impact of anaemia on maternal health, leading to increased rates of maternal morbidity and contributing to the high prevalence of low-birth-weight babies.

The study underscores the critical need for early detection and effective management of maternal complications to improve pregnancy outcomes. Additionally, it provides insights into potential areas for intervention and policy enhancement within the healthcare system of the Purnia district. By addressing these maternal health issues, the research aims to contribute to the development of better clinical practices and health policies, ultimately enhancing maternal-foetal health outcomes in the region. This focused examination emphasizes the importance of comprehensive prenatal care and targeted interventions to mitigate the risks associated with maternal complications.

Introduction

A vital component of public health, maternal health has a profound effect on the wellbeing of mothers and their offspring. Pregnancy can have several difficulties, which can be quite dangerous for both the mother and the fetus. Premature birth, low birth weight, foetal growth restriction, and higher maternal morbidity and mortality are all linked to common maternal problems like gestational diabetes, preeclampsia, anemia, and hypertensive diseases. It is imperative to comprehend the occurrence, contributing variables, and consequences of these issues in order to formulate efficacious healthcare tactics and measures.

This study focuses on the trends of maternal complications during pregnancy and their subsequent effects on maternal and foetal outcomes over a three-month period at a sub-divisional hospital in Purnia district. The hospital serves a diverse population, providing a representative sample for analysing these critical health issues. Recent data has highlighted concerning trends, including a high prevalence of postpartum haemorrhage (PPH) and low birth weight babies, underscoring the urgent need for improved prenatal care and management strategies.

The research aims to identify and analyse patterns in the occurrence and progression of maternal complications. By examining detailed patient records and clinical data, the study seeks to evaluate both the short-term and long-term effects of these complications on maternal and foetal health. The findings are expected to provide valuable insights into the current state of maternal health in the region and inform potential areas for intervention and policy enhancement.

Addressing maternal complications effectively requires a comprehensive approach, integrating early detection, appropriate management, and robust healthcare policies. This study aims to contribute to the body of knowledge necessary for enhancing maternal-foetal health outcomes and underscores the importance of targeted interventions in mitigating the risks associated with maternal complications. By focusing on the specific context of the Purnia district, this research hopes to pave the way for better clinical practices and health policies that can be implemented on a broader scale.

It was predicted that 211 maternal fatalities per 100,000 live births would occur globally in 2017 as a result of complications during pregnancy or childbirth. Over the last two decades, the number of maternal deaths among Indian women is estimated to have been 1.3 million, accounting for 12% of all maternal deaths globally. Direct medical issues were the main cause of maternal fatalities. The Sample Registration System shows that the maternal mortality ratio (MMR) dropped from 113 deaths per 100,000 live births between 2016 and 2018 to 103 deaths per 100,000 live births between 2017 and 2019. The majority of maternal deaths happened in the age range of 20–29 years old.

Any pregnancy that involves increased health risk or complications for the mother, foetus, or both during pregnancy or childbirth is referred to as high-risk pregnancy.

In 2016, the Prime Minister of India introduced the "Pradhan Mantri Surakshit Matritva Abhiyan (PMSMA)" program, which aims to provide complete and high-quality obstetric care to all pregnant women. The goal of this program was to monitor high-risk pregnancies for referral, counselling, and management of labour preparation until the baby was born.

High-Risk Pregnancy/Maternal complications during pregnancy include:

1. Age <18 years & >35 years
2. Height (<145cm)
3. Severe Anemia (<7 gm/dl)
4. Gestational diabetes,
5. Preeclampsia/ Eclampsia
6. Gestational hypertension,
7. Antepartum hemorrhage (APH)
8. Grand multipara
9. Multiple pregnancy
10. Mal presentation
11. Previous LSCS
12. Rh-negative women with Rh positive husband
13. Infection
14. Premature rupture of membrane
15. obstructed labor,
16. Prematurity,
17. Uterine rupture
18. Placenta Previa

PMSMA

The Pradhan Mantri Surakshit Matritva Abhiyan (PMSMA) is a flagship initiative launched by the Government of India aimed at improving maternal and fetal health outcomes. Introduced in 2016 by the Ministry of Health and Family Welfare, PMSMA seeks to provide comprehensive and quality antenatal care to all pregnant women across the country, with a special focus on those in rural and underserved areas.

Objectives and Services

The primary objective of PMSMA is to ensure that every pregnant woman in India receives at least one check-up in the second or third trimester of pregnancy by a qualified doctor. The initiative is designed to supplement the existing antenatal care framework and address critical gaps in the healthcare delivery system. Key services provided under PMSMA include:

1. **Comprehensive Antenatal Check-ups:** Regular health check-ups are conducted by obstetricians/gynaecologists and other specialists to monitor the health of the mother and foetus.
2. **Screening and Diagnostic Services:** Screening for high-risk pregnancies and diagnostic tests, including blood pressure measurement, blood tests for anemia, diabetes screening, and ultrasound examinations, are provided.

3. **Identification of High-Risk Pregnancies:** High-risk pregnancies are identified and appropriately managed through specialized care and referral to higher medical facilities if necessary.
4. **Counseling and Health Education:** Pregnant women receive counseling on nutrition, birth preparedness, complication readiness, and institutional delivery.
5. **Iron and Folic Acid Supplementation:** To prevent and treat anemia, which is a common maternal complication, iron and folic acid tablets are distributed.
6. **Tetanus Toxoid Vaccination:** Immunization against tetanus is provided to all pregnant women.

Literature Review

1. Negative maternal outcomes, such as obstructed labor, antepartum and postpartum hemorrhages, surgical delivery, and hypertensive pregnancy disorders, are frequently linked to pregnancies in older moms. About 40% of the older moms surveyed in this study reported having at least one unfavorable maternal outcome. The most frequent unfavorable outcomes for these mothers were obstructed labor and cesarean delivery. Adverse outcomes were more common in older moms with prolonged labor, fast labor, and chronic hypertension. The study revealed that the two main unfavorable outcomes for mothers were obstructed labor (14.4%) and surgical delivery (23%). In addition, there were less frequent events such multiple pregnancies, antepartum hemorrhage, chorioamnionitis, preeclampsia, eclampsia, gestational diabetes, and postpartum hemorrhage.
2. Nearly half of all pregnancies in India involve one or more high-risk factors, which is a significant concern. These risks are particularly common among vulnerable populations, such as those with no education and the poorest groups. The main high-risk factors include short birth spacing, adverse birth outcomes, and cesarean deliveries. The prevalence of high-risk pregnancies among Indian women is 49.4%, with 33% experiencing a single high-risk factor and 16.4% facing multiple high-risk factors.
3. Anemia is more prevalent in low- and middle-income countries, including India, and is linked to increased risks of maternal health problems and adverse birth outcomes. In India, 52.2% of pregnant women are affected by anemia. This rate is even higher among certain groups: adolescent women (61.5%), those with no education (59.2%), those in the poorest wealth index (61.9%), scheduled tribes (59.3%), and those from the eastern region of India (62.1%). Anemia is also more common among women who smoke, use tobacco, or consume alcohol (63.0%), and those with shorter birth intervals (59.7%). Among Indian states, the prevalence of anemia is particularly high in Bihar (63.1%) and the union territory of Ladakh (71.4%).
4. The study results indicate that maternal complications were more common in deliveries performed by lower segment caesarean section (LSCS) compared to vaginal deliveries. According to the World Health Organization (WHO), around 15% of deliveries require a caesarean section due to specific indications where it is crucial for preserving the health of the mother and/or the fetus.

5. The study found that early postpartum hemorrhage and composite maternal morbidity were lower in cesarean deliveries without labor compared to those with labor induction. Hemorrhagic and traumatic morbidities were higher following labor induction, especially after assisted vaginal delivery and cesarean delivery during labor, compared to cesarean deliveries without labor. Subgroup analyses of maternal outcomes after labor induction by method of delivery revealed additional risks of traumatic morbidity. The highest morbidity rates were observed in the groups undergoing assisted vaginal delivery and cesarean delivery during labor.

METHODOLOGY

Study Design

A cross-sectional study was conducted among deliveries at SDH Banmankhi, spanning from February,20 to May,20

Study Area

Sub Divisional Hospital, Banmankhi,Purnea, Bihar

Study Population

Pregnant women who were identified as high-risk pregnancies/complications during pregnancy at Sadar Hospital

Sample size and sampling:

$$n = Z^2 p (1 - p) / e^2$$

Where 'z' is the confidence interval of 95% (z score- 1.96), 'p' is the prevalence of the proportion population from the previous study (57%), and 'e' is the margin of error of 5%.

The sample size of this study is 377

Finally, for operation ease sample size was 385

Inclusion criteria Pregnant women who had at least one complication during their antepartum period.

- Pregnant women aged between 15-49 years.

Exclusion criteria

- Pregnant women aged between 15-49 years who have not had any complications during their antepartum period.

Sampling strategy

- Through purposive sampling, ANC & Labour room records at Sadar Hospital were accessed to identify eligible participants.
- At first based on their maternal complication during pregnancy, pregnant women were identified.
- After identification, history was taken from the registration log books and individual cards.
- This process facilitated through a structured data collection checklist.

Study Variables:

- **Dependent Variable:** Maternal and fetal outcomes (e.g., maternal mortality, maternal morbidity, fetal birth weight, neonatal complications).

- **Independent Variable:** Maternal complications during pregnancy (e.g., Age of the woman, height of the woman, Anemia, gestational diabetes, preeclampsia, gestational hypertension, placental abnormalities, preterm labor, etc.)

Data analysis:

- Data were entered into Microsoft Excel and cleaned to correct errors and fill in missing values.
- Data analysis provided a summary of the prevalence of maternal complications and adverse outcomes.

RESULTS AND ANALYSIS

The contributing factors for high-risk and low-risk pregnancies among currently pregnant Indian women are shown in Table 1.

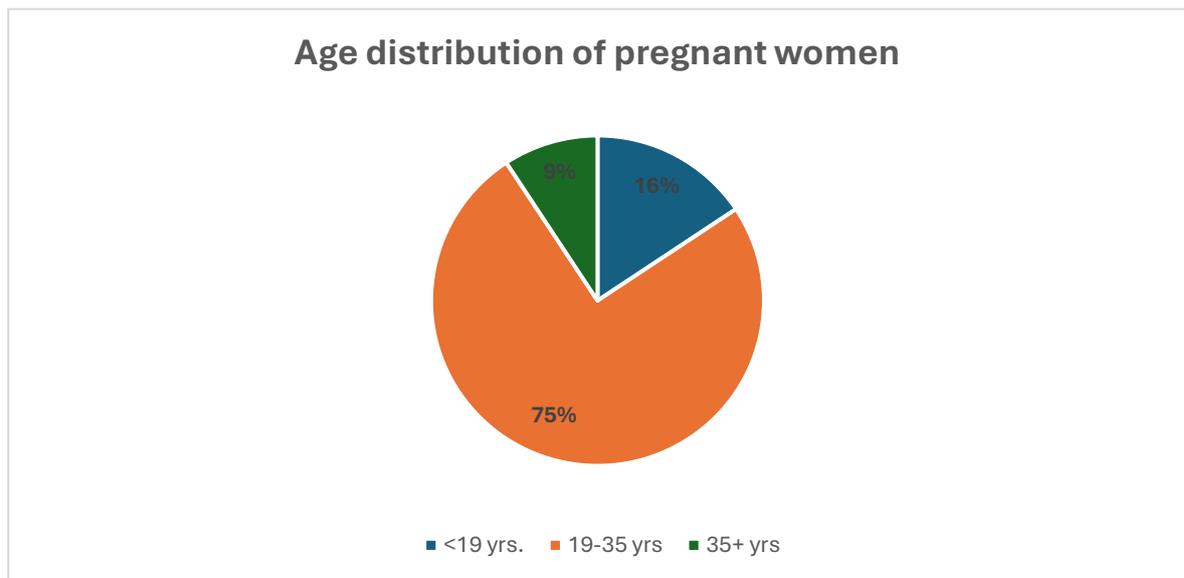
Total deliveries conducted in Banmankhi SDH during past 3 months is 1547 , out of which 1021 cases were observed with high risk pregnancies (that will come out to almost 66%).

Out of these High risk pregnancies, 385 cases were randomly selected for the study .

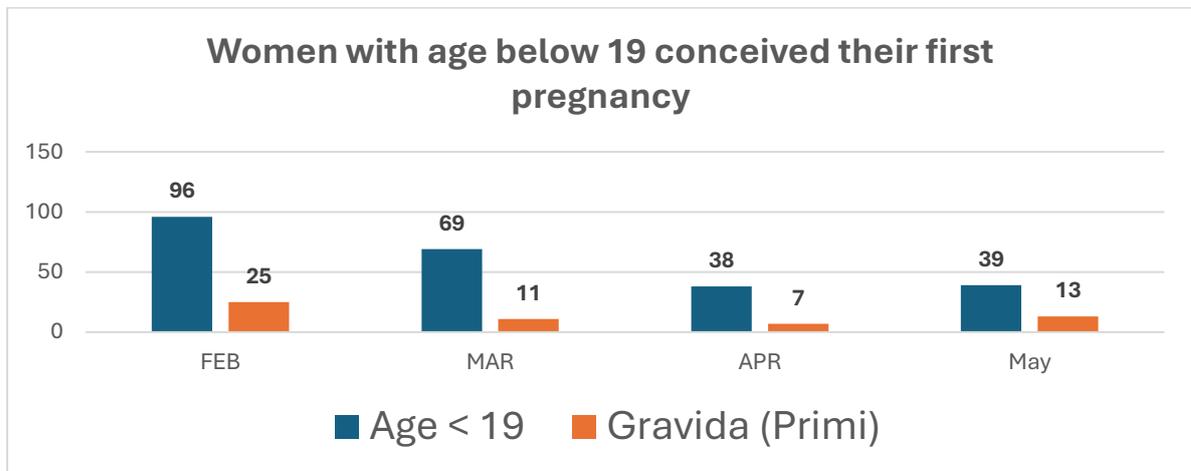
Total Deliveries	Maternal Complications	Percentage
1547	385	25%

Table 1

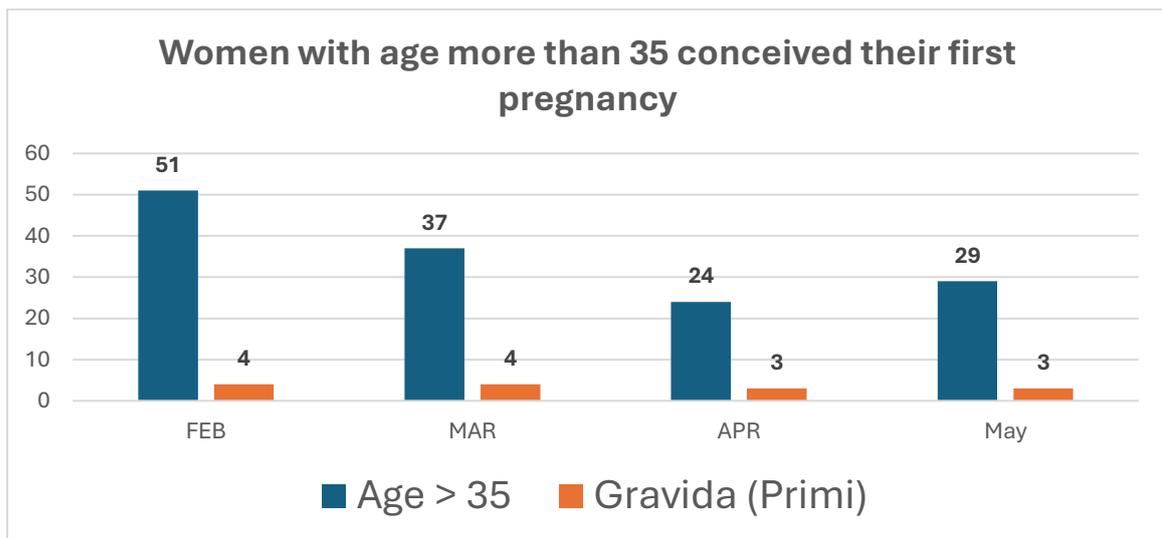
Age distribution among pregnant woman is done in 3 categories <19y/o , 19-35 y/o and >35 y/o.



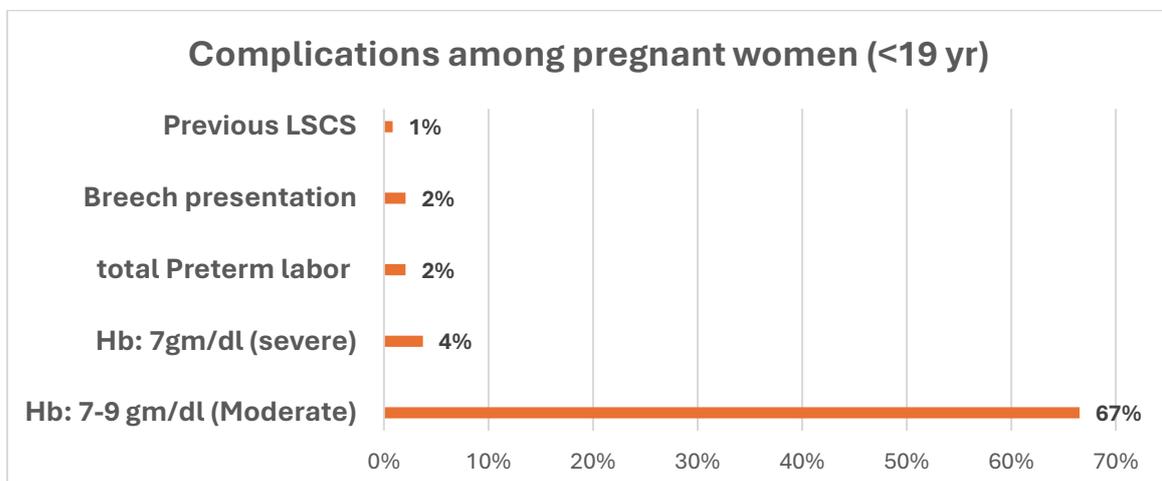
It was observed that there are pregnant women with gravida 1 with below age 19 , they were categorized separately. The distribution of the pregnant woman of less than 19 year and with primi is given below -



There were also woman with more than 35 year of age and conceiving first pregnancy , the no. of such woman given below month wise.



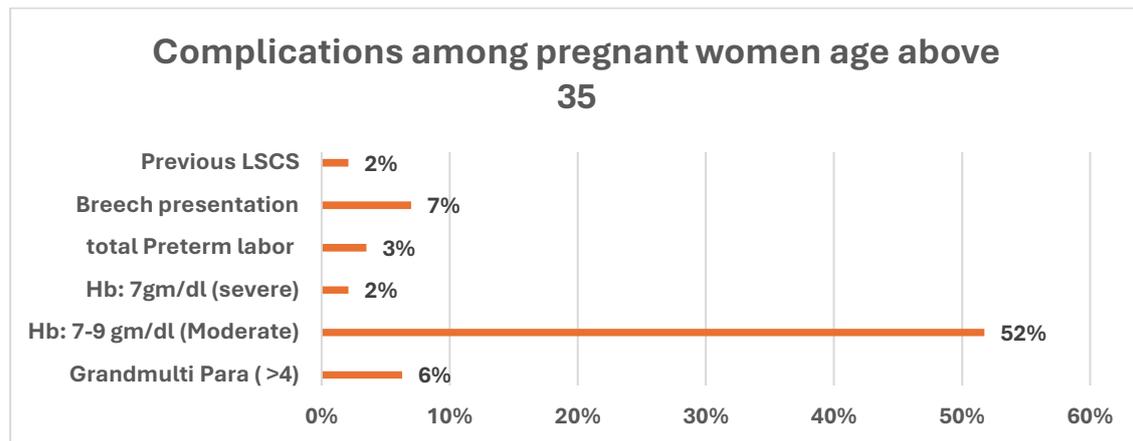
Prevalence of Complications within 19 year of age pregnant woman is shown below -



It was seen that there is high prevalence of moderate Anaemic pregnant women (<19 yr) that is 67% , almost two-third of young primi were suffering from anaemia.

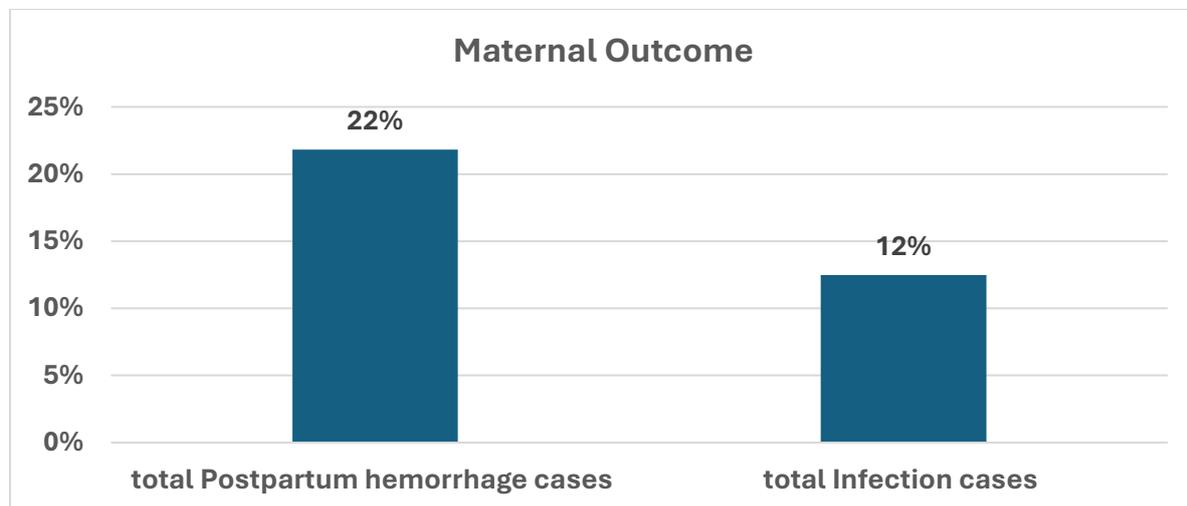
Second highest complication within same category is again anemia but of severe type that is women with less than 7gm/dl of Hb in blood.

Third highest category in complications of young primi is preterm labour , which could be a reason many biological , physical , environmental, etc. factors.

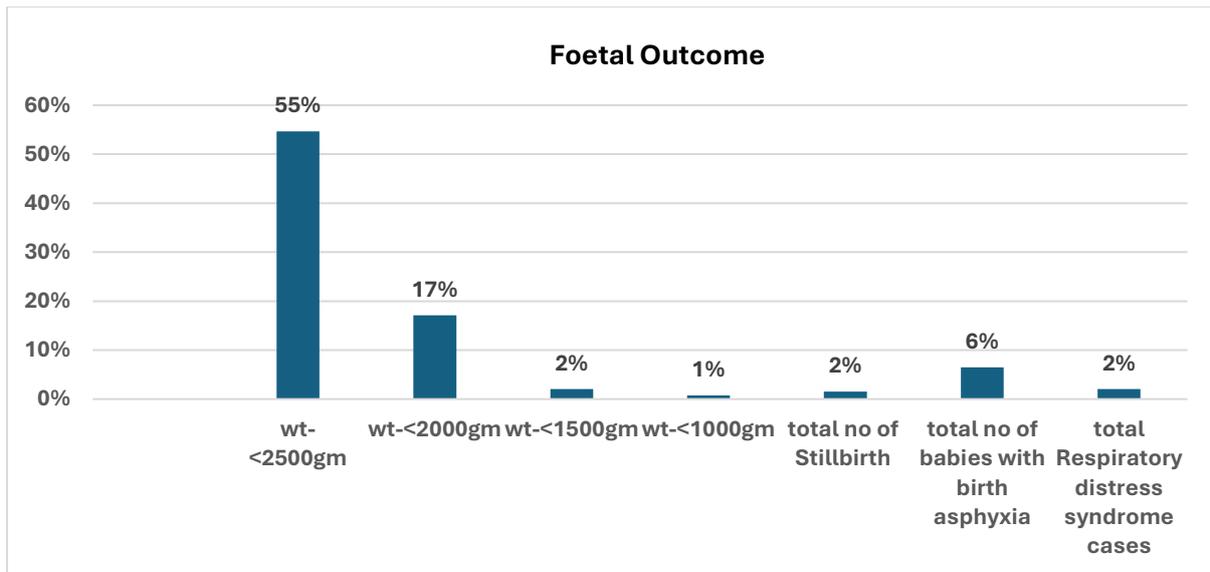


The majority complications among women with age more than 35 were shown above.

Women with moderate anaemia were high in no. among this age group.



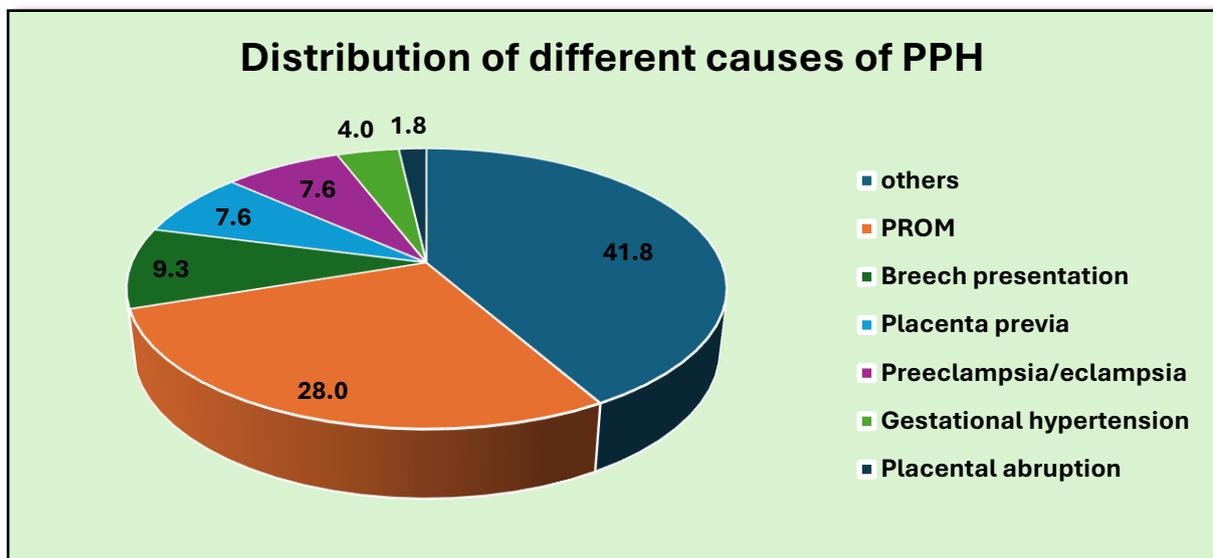
Maternal Impact of complications according to available data were shown in the above chart.



Impact of complications to foetal were shown above which consist of birth weight , respiratory illness etc, the majority of the foetus (55%) were shown with low birth weight which was less than 2500gm and 17% were found with less than 2000gm and 2% with less than 1500gm and 1% with less than 1000gm.

Out of total 2% was stillbirth which need to be focused as early as possible.

And 8% newborn babies were facing some kind of respiratory illnesses like asphyxia or distress.



The causes of PPH that were associated with it are shown in the above pie chart .

DISCUSSION

- Globally almost 75% of those maternal deaths occur during & following childbirth.
- Maternal complications have a high impact on maternal & fetal outcomes
- Most Prevalence cases in maternal complications included obstructed labor (51.7%), hemorrhage (44.7%), eclampsia (24.1%), and sepsis (6.9%).
- Most Prevalence cases among newborns are birth asphyxia (54.6%) followed by Premature birth(48.9%), neonatal infections(22.6), and congenital anomalies(13.5%).
- In India, maternal complications during pregnancy are becoming an increasing concern.
- Studies in Uttar Pradesh revealed that 38% of women suffer from maternal complications during pregnancy, with 7.0% experiencing postpartum hemorrhage following delivery, and notably, 5.4% reporting postpartum pre-eclampsia
- The prevalence of high-risk pregnancies (HRPs) is notably high in Indian states such as Meghalaya (67.8%), Manipur (66.7%), and Mizoram (62.5%). Other states with significant HRP rates include Bihar (57%), Uttar Pradesh (55.2%), and Jharkhand (51.7%).

The purpose of this dissertation was to investigate the impact of maternal complications on childbirth outcomes. By examining cases from a sub-divisional hospital using random sampling, the study aimed to provide insights into the relationship between maternal health issues and fetal outcomes. The findings underscore the critical need for timely and effective interventions to mitigate adverse effects on newborns.

The analysis revealed several significant correlations between maternal complications and adverse childbirth outcomes. Mothers experiencing complications such as hypertension, diabetes, and preeclampsia were more likely to have preterm births, low birth weight infants, and higher rates of neonatal intensive care unit (NICU) admissions. These findings are consistent with existing literature, which emphasizes the detrimental effects of maternal health issues on fetal development and birth outcomes.

The methodology involved random sampling of cases with documented maternal complications from a sub-divisional hospital. This approach allowed for a representative sample, although it also introduced certain limitations. The absence of a standardized line listing and reliance on rough data presented challenges in ensuring the accuracy and completeness of the dataset. Despite these limitations, the study's findings offer valuable insights into the impact of maternal health on childbirth.

The implications of these findings are far-reaching. They highlight the urgent need for healthcare systems to prioritize maternal health, especially in sub-divisional hospitals where resources may be limited. Ensuring early detection and management of maternal complications can significantly improve fetal outcomes. This underscores the importance of training healthcare providers to recognize and respond to maternal health issues promptly.

Moreover, the study suggests that policy interventions aimed at improving maternal health can lead to a reduction in adverse fetal outcomes. This can include enhanced prenatal care, better

screening protocols, and increased access to healthcare services for pregnant women. By addressing maternal health issues proactively, healthcare systems can improve not only the health of mothers but also the long-term well-being of children.

This study faced several limitations, primarily related to data quality. The rough data and lack of line listing made it difficult to ensure the precision of the analysis. Additionally, the study was conducted in a single sub-divisional hospital, which may limit the generalizability of the findings to other settings. Future research should aim to include larger, more diverse samples and utilize more rigorous data collection methods to validate these findings.

Suggestions for Future Research

Building on this study, future research should explore the following areas:

1. **Comprehensive Data Collection:** Implement standardized data collection protocols to improve data accuracy and completeness. This can involve creating detailed line listings and employing electronic health records.
2. **Longitudinal Studies:** Conduct long-term studies to assess the impact of maternal complications on children's health and development beyond the neonatal period.
3. **Interventional Studies:** Evaluate the effectiveness of specific interventions aimed at reducing maternal complications and improving fetal outcomes. This can include clinical trials of new screening and treatment protocols.
4. **Broader Population Studies:** Extend the research to include multiple hospitals and diverse populations to enhance the generalizability of the findings.

Conclusion

This dissertation has elucidated the profound impact of maternal complications on childbirth outcomes, drawing from a randomly sampled set of cases in a sub-divisional hospital. The study's findings underscore the critical relationship between maternal health and fetal well-being, reinforcing the notion that maternal complications significantly elevate the risk of adverse birth outcomes such as preterm births, low birth weights, and increased NICU admissions.

The key findings from this study indicate that maternal complications like hypertension, diabetes, Anaemia and preeclampsia are strongly associated with negative birth outcomes. These complications, if not managed adequately, can lead to significant health challenges for both the mother and the newborn. The results align with existing research, providing further evidence that underscores the urgency of addressing maternal health issues as a public health priority.

Despite its valuable contributions, this study faced several limitations. The rough data and absence of a standardized line listing posed challenges in ensuring data accuracy and completeness. Additionally, the study's focus on a single sub-divisional hospital limits the generalizability of the findings. Future research should aim to overcome these limitations by employing more rigorous data collection methods, including comprehensive line listings and electronic health records, and by expanding the scope to include multiple hospitals and diverse populations. Longitudinal studies that track maternal and child health outcomes over time can provide deeper insights into the long-term effects of maternal complications. Interventional studies are also essential to evaluate the effectiveness of specific healthcare interventions in reducing the incidence and impact of maternal complications. Such research can inform evidence-based practices and policies that enhance maternal and foetal health.

In conclusion, this dissertation underscores the significant impact of maternal complications on childbirth outcomes and the critical need for effective interventions. By improving maternal health through targeted healthcare practices and policy measures, it is possible to mitigate adverse fetal outcomes and promote healthier pregnancies. The findings from this study contribute to the broader understanding of maternal-fetal health dynamics and provide a foundation for future research and policy initiatives aimed at safeguarding the health of mothers and their children. As we move forward, a continued focus on maternal health will be essential in achieving better health outcomes for both mothers and their newborns, ultimately contributing to healthier communities and a more resilient healthcare system.

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