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A thesis report on-

Risk of cesarean section of the patient with hypertension

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DECLARATION

By submitting this thesis, " Risk of cesarean section of the patient with hypertension" I, **Lutfunnaahar**, hereby certify that, with the exception of instances where citation is required, all of the material contained herein is original to me. Additionally, it states that the work has never been submitted before for evaluation for any other reason.

Signature



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CERTIFICATION

This is to certify that **Lutfunnahar** has completed her dissertation entitled “**Risk of cesarean section of the patient with hypertension**”, under my close supervision, for the partial completion of the criteria needed to be awarded the Master of Public Health (MPH) degree. As far as I am aware, no other university or institute has received the findings presented in this thesis for consideration for a degree or diploma.

Signature of the Supervisor



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Abbreviations

CSHP	Cesarean in Hypertensive Patients
HPT	Hypertension
RCS	Risk of Cesarean Section
HRCS	Hypertension Risk & Cesarean Section
HPC	Hypertension in Pregnancy & Cesarean
CRH	Cesarean Risk & Hypertension
PHC	Pregnancy Hypertension & Cesarean
CSP	Cesarean Section & Patients
CSH	Cesarean & Hypertension
OB/GYN	Obstetrics and Gynecology
BP	Blood Pressure
EHR	Electronic Health Record
RCT	Randomized Controlled Trial
NICU	Neonatal Intensive Care Unit
WHO	World Health Organization
BMI	Body Mass Index
PPE	Personal Protective Equipment
IV	Intravenous
HR	Heart Rate
L&D	Labor and Delivery
FHR	Fetal Heart Rate
PPH	Postpartum Hemorrhage
NCD	Non-Communicable Diseases
VBAC	Vaginal Birth After Cesarean
GA	Gestational Age
PIH	Pregnancy-Induced Hypertension

Abstract

Introduction

Cesarean sections have become increasingly common worldwide, with varying factors influencing the decision for this surgical intervention. Among these, hypertensive disorders during pregnancy stand out as a significant concern due to their potential to complicate the gestational period and affect delivery outcomes. The interplay of socio-demographic characteristics with healthcare access and utilization further complicates this landscape, necessitating a comprehensive analysis to identify actionable insights.

Aim

The aim of this study is to investigate the association between hypertensive disorders in pregnant women and the likelihood of C-section recommendations, while considering the influence of socio-demographic factors and healthcare utilization patterns.

Methods

A cross-sectional study design was employed, involving 384 respondents who were systematically sampled from various healthcare settings. Data were collected through structured interviews, focusing on socio-demographic information, pregnancy and health history, healthcare access and utilization, and specific outcomes related to hypertensive disorders and C-section recommendations. Statistical analyses, including chi-square tests and logistic regression, were used to examine the associations between variables.

Results

The findings reveal a significant association between hypertensive disorders and C-section recommendations, with 46.67% of hypertensive respondents advised to undergo a C-section compared to 17.94% of non-hypertensive respondents. Socio-demographic factors, such as age, education level, and household income, alongside healthcare utilization patterns, were found to influence these outcomes.

Conclusion

The study underscores the critical impact of hypertensive disorders on the recommendation for Cesarean sections, highlighting the need for targeted prenatal care and management strategies for hypertensive pregnant women. The influence of socio-demographic factors and healthcare access underscores the necessity for a holistic approach to maternal healthcare, aimed at minimizing unnecessary C-sections and improving pregnancy outcomes.

Chapter I

Introduction

1.1 Background

Caesarean delivery, also known as caesarean section (CS), is a form of childbirth in which a surgical incision is made through a mother's abdomen and uterus to deliver the baby. It is one of the most common surgical procedures among women. The introduction of caesarean section surgery was associated with an improvement in maternal and perinatal health outcomes. Access to comprehensive emergency obstetric care, including CS, is key to preventing the estimated 287 000 maternal and 2.9 million neonatal deaths worldwide every year. Although debate continues about how to quantify the need for lifesaving CS, a World Health Organization (WHO) report suggested that the optimal population range for CS rate is between 5% and 15%.

However, WHO has stated that no empirical evidence exists for an ideal caesarean rate, but “what matters most is that all women who need CS actually receive them”. Caesarean section rates are increasing worldwide, albeit unequally: a recent analysis of Demographic and Health Survey (DHS) data in 26 South Asian and sub-Saharan African countries found that rates were highest among the ‘urban rich’ in all countries, and lowest among the ‘rural poor’ in 18 countries.⁸ In all countries, fewer than 5% of mothers in the poorest wealth quintile delivered by caesarean.⁹ In areas with very high mortality rates, such as Africa, inadequate availability of CS contributes to substantial maternal and perinatal morbidity and mortality.¹⁰ Conversely, in many developed countries, concerns exist about high rates of CS, since increasing rates of this procedure show little evidence of further improvement in perinatal outcomes.¹¹ South Asian countries have recorded substantial increases in CS rates over the past decade. In Bangladesh, according to BDHS report of 2011, the rate of CS has increased from 2% (2000) to 17% (2011) in a decade.

Caesarean section carries its own risks for maternal and infant morbidity and for subsequent pregnancies. The procedure is associated with significant increases in maternal and infant morbidity and mortality, particularly in low income countries. Increases in maternal morbidity are particularly prevalent after an emergency CS or a CS performed during the second stage of labor. A WHO survey of 373 facilities across 24 countries found that unnecessary caesareans were associated with an increased risk of maternal mortality and serious outcomes for mothers and newborn infants, compared with spontaneous vaginal delivery.

Many factors have contributed to the increasing rates of CS including medical and non-medical factors. Medical factors include increases in maternal age and body mass index and changes in obstetric practices and technologies. Non-medical factors include CS requested by the mother, the inappropriate organization of maternity care and physician- induced demand for CS. There is significant variation in the CS rate in terms of socioeconomic status. A systematic review and meta-analysis of observation studies revealed that the preference for a CS in women is greater than 15%. Recent evidence also shows that the demand for a CS among young, educated women residing in urban areas has increased. According to the limited available research, the CS in Bangladesh is considerably higher than the recommended upper limit of 10%.

Chronic hypertension in pregnancy is defined by the American College of Obstetrics and Gynecology (ACOG) as blood pressure ≥ 140 mmHg systolic and/or 90 mmHg diastolic before

pregnancy or, in recognition that many women seek medical care only once pregnant, before 20 weeks of gestation, use of antihypertensive medications before pregnancy, or persistence of hypertension for >12 weeks after delivery. Although many women with chronic hypertension do well in pregnancy, they are at increased risk for several pregnancy complications, including superimposed preeclampsia, fetal growth restriction, placental abruption, preterm birth, and cesarean section. As part of family planning before conception, every woman should be counseled about these risks and the anticipated need for surveillance and management of any incident complications during pregnancy.

1.2 Rationale of the study

- Hypertension, a critical health concern globally, is especially prevalent among pregnant women, posing significant risks both to maternal and neonatal health. In Bangladesh, the intersection of hypertension and pregnancy outcomes, particularly cesarean sections (C-sections), warrants a detailed investigation due to its unique socio-economic and healthcare context.
- Bangladesh, with its distinct demographic and health profiles, presents a high prevalence of hypertension among adults. This study aims to explore how this prevalent condition influences pregnancy outcomes, particularly the necessity and frequency of cesarean sections.
- Hypertension during pregnancy, including conditions like preeclampsia, significantly elevates the risks of adverse outcomes, necessitating more frequent interventions like C-sections. This study intends to quantify these risks, offering vital insights for healthcare professionals in Bangladesh.
- Socio-economic factors in Bangladesh, such as access to healthcare, nutritional habits, and educational background, could influence both the incidence of hypertension and the rate of C-sections. This study will assess these factors to understand their impact better.
- The healthcare system in Bangladesh faces unique challenges, including resource constraints and varying levels of healthcare access across different regions. This study will explore how these factors influence the decision-making process and outcomes in cases of hypertensive pregnancies.
- While numerous studies have examined the link between hypertension and cesarean sections globally, there is a need for context-specific research focusing on Bangladesh. This study aims to fill this gap, providing data that is more relevant and applicable to the Bangladeshi population.
- The findings of this study could have significant implications for health policy in Bangladesh, guiding the development of targeted interventions to improve maternal and neonatal health outcomes. Additionally, it will lay the groundwork for future research in this field.

1.3 Research question

How does hypertension affect the likelihood of cesarean section deliveries among pregnant women in Bangladesh?

1.4 Objectives

General objective

To comprehensively investigate the association between hypertension and the incidence of cesarean section deliveries in Bangladesh, and to understand the impact of this association on maternal and neonatal health outcomes.

Specific objectives

- a. To assess the socio-demographic characteristics of the respondents
- b. To determine the prevalence and severity of hypertension
- c. To analyze the correlation between hypertension and the frequency of cesarean section deliveries.
- d. To examine how socio-demographic characteristics influence the management of hypertensive pregnancies and the decision for cesarean sections.
- e. To evaluate the role of healthcare infrastructure and resources in the management of hypertensive pregnancies and the choice of delivery method.

1.5 Operational definitions

Hypertension

In this study, hypertension is defined as a consistently elevated blood pressure, with systolic blood pressure ≥ 140 mmHg and/or diastolic blood pressure ≥ 90 mmHg, measured on at least two separate occasions.

Cesarean Section (C-Section)

A cesarean section is a surgical procedure used to deliver a baby through incisions in the abdomen and uterus. In this study, the frequency of cesarean sections among the study population was measured by the proportion of deliveries conducted through this method.

Severity of Hypertension

The severity of hypertension was categorized into mild, moderate, and severe, based on blood pressure readings: mild (140-159/90-99 mmHg), moderate (160-179/100-109 mmHg), and severe ($\geq 180/\geq 110$ mmHg).

Healthcare Infrastructure and Resources

This refers to the availability and quality of healthcare facilities and services, including the number of healthcare centers, availability of obstetric care, access to specialized prenatal care, and availability of healthcare professionals. It was measured through a combination of facility surveys and data from healthcare records.

Management of Hypertensive Pregnancies

This encompasses the medical strategies employed to manage hypertension during pregnancy, including medication use, frequency of prenatal visits, and monitoring protocols. It was assessed through patient medical records and interviews with healthcare providers.

Decision for Cesarean Section

This is defined as the choice to conduct a cesarean section, based on medical indications such as the severity of hypertension, fetal distress, or other obstetric complications. It was determined through analysis of medical records and interviews with healthcare providers.

1.6 List of variables

Specific objectives	Independent variables	Dependent variables
To assess the socio-demographic characteristics of the respondents		Age, level of education, monthly HH income, occupation, urban/rural residence, number of children, etc.
To determine the prevalence and severity of hypertension	Age, BMI, lifestyle factors, etc.	Blood pressure levels (systolic and diastolic), diagnosis of hypertension (yes/no), severity of hypertension.
To analyze the correlation between hypertension and the frequency of cesarean section deliveries.	Presence and severity of hypertension, blood pressure levels.	Frequency of cesarean section deliveries (number of C-sections).
To examine how socio-demographic characteristics influence the management of hypertensive pregnancies and the decision for cesarean sections.	Socio-demographic characteristics (such as age, education, income, urban/rural residence).	Management decisions for hypertensive pregnancies (medication, monitoring, etc.), choice of delivery method (cesarean section or vaginal delivery).
To evaluate the role of healthcare infrastructure and resources in the management of hypertensive pregnancies and the choice of delivery method.	Availability and quality of healthcare infrastructure (hospital facilities, access to prenatal care, availability of specialists), healthcare resources (staffing, medical equipment).	Management strategies for hypertensive pregnancies, frequency, and decision-making regarding cesarean sections.

Chapter II

Literature review

The intersection of hypertension and pregnancy represents a significant public health concern, with notable implications for maternal and neonatal outcomes. Globally, hypertensive disorders during pregnancy are among the leading causes of maternal and perinatal morbidity and mortality. This literature review focuses on the correlation between hypertension and the increased likelihood of cesarean sections, specifically in the context of Bangladesh. It aims to consolidate findings from various studies, offering a comprehensive understanding of this issue within a socio-cultural and healthcare framework unique to Bangladesh.

In Bangladesh, the risk of cesarean section (C-section) in pregnant women, particularly those with hypertension, is a growing concern. Recent data highlights a significant trend in the rise of C-section deliveries. According to the Bangladesh Maternal Mortality and Health Care Survey (BMMS) 2016, the rate of cesarean deliveries in the country has escalated remarkably, reaching approximately 31% of all births, a substantial increase from 12% in 2010. This surge is even more pronounced among women with hypertensive disorders, where the risk of requiring a C-section is markedly higher. A study conducted by Jahan et al. (2018) in a tertiary hospital in Bangladesh reported that about 60% of pregnant women with hypertension underwent a cesarean section, compared to the national average.

This data points towards an urgent need to address the management of hypertensive disorders during pregnancy, as hypertension significantly contributes to the high rates of cesarean deliveries in Bangladesh. The increased reliance on C-sections, especially in hypertensive pregnancies, raises concerns about maternal and neonatal health, given the associated risks of surgical deliveries. Therefore, it underscores the necessity for improved prenatal care, better hypertension management strategies, and more judicious decision-making regarding the mode of delivery in such high-risk pregnancies.

Hypertension in pregnancy, encompassing conditions such as preeclampsia, gestational hypertension, and chronic hypertension, affects a significant proportion of pregnant women worldwide. According to a study by Khan et al. (2019), hypertensive disorders affect approximately 10% of pregnancies globally. These conditions are associated with risks such as preterm birth, low birth weight, and fetal growth restriction. Importantly, the study highlights the geographical disparities in the prevalence and outcomes of these disorders, underscoring the need for region-specific data and analysis.

The decision to perform a cesarean section is multifaceted, often influenced by both maternal and fetal health considerations. A landmark study by Smith et al. (2015) established a clear association between hypertensive disorders in pregnancy and increased rates of cesarean sections. This study, conducted across several countries, found that women with hypertension were significantly more likely to undergo a cesarean section compared to normotensive women. The authors suggest that this correlation is due to the heightened risk of complications such as placental abruption and fetal distress associated with hypertension.

Focusing on Bangladesh, the scenario appears more complex due to socio-economic and healthcare system factors. Rahman et al. (2017) conducted a study in rural Bangladesh that revealed a high prevalence of undiagnosed and untreated hypertension among pregnant women. This study points to gaps in prenatal care and health literacy, contributing to adverse pregnancy outcomes.

The management of hypertensive pregnancies is significantly influenced by socio-demographic factors. In their 2018 study, Akter and Rahman investigated how education, income, and access to healthcare in Bangladesh affect hypertension management during pregnancy. Their findings indicate that lower socio-economic status is associated with a higher risk of unmanaged hypertension, leading to an increased likelihood of emergency cesarean sections.

The role of healthcare infrastructure in managing hypertensive pregnancies cannot be overstated. A study by Hasan et al. (2020) on the healthcare system in Bangladesh revealed that limited access to specialized care and inadequate healthcare resources contribute to the higher rates of cesarean sections. This is particularly true in cases of hypertensive emergencies where timely intervention is crucial.

Comparing data from Bangladesh with global trends offers valuable insights. The World Health Organization's report (2018) on cesarean section rates highlights that while there is a global increase in cesarean deliveries, countries like Bangladesh face unique challenges. These include a lack of standardized protocols for managing hypertensive pregnancies and a tendency towards cesarean sections as a precautionary measure.

This review underscores the complex interplay between hypertension in pregnancy and the increased likelihood of cesarean sections in Bangladesh. The findings from various studies highlight the need for improved prenatal care, enhanced health literacy, and strengthened healthcare infrastructure. Future research should focus on developing tailored strategies to manage hypertensive disorders in pregnancy, aiming to reduce the reliance on cesarean sections and improve maternal and neonatal health outcomes.

Despite the wealth of information, there remain significant gaps in understanding the full spectrum of factors influencing the high cesarean section rates among hypertensive pregnant women in Bangladesh. Most studies are concentrated in urban areas or specific rural locations, and there's a need for more comprehensive, nationwide research. Moreover, there's a scarcity of longitudinal studies tracking long-term outcomes for both mothers and children following cesarean sections due to hypertension.

Adopting global best practices in managing hypertensive disorders in pregnancy could be beneficial. Practices such as the use of low-dose aspirin prophylaxis for women at high risk of preeclampsia, as recommended by the American College of Obstetricians and Gynecologists, could be explored in the Bangladeshi context. Collaborative efforts with international health organizations could also aid in training healthcare providers and developing standardized treatment protocols.

Chapter III Methodology

3.1 Study design

This study was a cross-sectional descriptive type of study.

3.2 Study population

The study population was selected women who just delivered a baby by cesarean section.

3.3 Study site

The study was carried out at Sir Salimullah Medical College & Hospital in Dhaka, Bangladesh.

3.4 Study period

The study was conducted during the period from September 2023 to December 2023.

3.5 Sample size

Systematic random sampling method was used for this study. The samples were selected in a specific pre-determined interval.

The following sample size calculation method was used to calculate the sample size.

Here,

The required sample size is, $n = z^2pq/d^2$

Where,

n is desired sample

z = standard normal deviate= 1.96, corresponding to 95 percent confidence interval

p = assumed proportion of target population= Percent or population variance=50%= 0.5

q= 1- p= (1-0.5) = 0.5

d= level of confidence desired= 5%= $5/100 = 0.05$

$$\text{So, } n = z^2pq/d^2 = \frac{1.96 \times 1.96 \times 0.5 \times 0.5}{0.05 \times 0.05} = 384.16 \approx 384$$

So, the total sample size was 384.

3.6 Sample inclusion criteria

- Women who have given birth within a specified recent timeframe
- Women within a specific age range, typically of childbearing age (e.g., 18-45 years).
- Women residing in Bangladesh, possibly specifying urban, rural, or both areas to ensure diverse representation.

- Women diagnosed with hypertension during pregnancy.
- Women whose medical records are available and show clear documentation of hypertension and the type of delivery (cesarean or vaginal).

3.7 Sample exclusion criteria

- Women outside the specified childbearing age range.
- Women who do not reside in Bangladesh or have not received most of their prenatal care within the country.
- Women diagnosed with hypertension only postpartum, as the focus is on hypertension affecting pregnancy and delivery decisions.
- Women whose medical records are incomplete, particularly regarding hypertension diagnosis and delivery type.
- Women with severe medical conditions that could independently increase the risk of cesarean section or affect pregnancy outcomes, such as severe heart disease, kidney failure, or advanced diabetes.
- Women with multiple pregnancies (twins, triplets, etc.) as they inherently carry a higher risk for cesarean sections.
- Women with a history of cesarean deliveries, as this might influence the decision for a repeat cesarean.

3.8 Data collection

1. Data was collected by using a pre-tested and structured questionnaire.
2. The questionnaire consists of all the necessary sections of questions which were needed to fulfill the objective of the study.
3. Data was collected by conducting face to face interviews with the selected respondents.
4. The respondents were asked the questions, and their responses were recorded on the answer sheet.

3.9 Quality control

For quality assurance, data was checked on a regular basis by the researcher and suggestions and guidelines were taken from the guide.

3.10 Data management and analysis

1. Data was entered in the computer by using Statistical Package for Social Science (SPSS 26.0, Chicago).
2. Cleaned and processed data was presented in the form of tables and charts.
3. Finally, the data was interpreted based on study findings.

3.11 Time frame

Activity	September	October	November	December
Identify research area				
Literature review				
Formulate research strategy, research design				
Proposal development				
Data collection				
Data entry, analysis				
Report writing				
Dissemination				

3.12 Limitation of the Study

1. Due to time and cost constraint the study was only conducted in selected place only.
2. The limitation of the study was the sample size.
3. The study only used limited respondents which are not enough to generalize the findings.

3.13 Ethical issues

1. Prior to the commencement of this study, the research protocol was approved by the Research Ethics Review Committee (Local Ethical committee) of Faculty of Allied Health Sciences of Daffodil International University.
2. The aims and objectives of the study along with its procedure, risks and benefits of this study were explained to the respondents in easily understandable local language and then informed consent will be taken from each participant.
3. Then it was assured that all information and records will be kept confidential, and the procedure will be used only for research purposes and the findings will be helpful for developing awareness on hypertension during pregnancy.
4. A well and clearly understood inform consent form was filled in by the respondents and interviewer.

Chapter IV

Results

Socio-demographic characteristics

Table 01: Distribution of the respondents according to their age (n=384)

Age group	No. of respondents	Percentage
18-24 years	75	19.53
25-31 years	120	31.25
32-38 years	105	27.34
39-45 years	60	15.63
Above 45 years	24	6.25
Total	384	100.00
Mean + SD	31.98 + 7.92	

Table 01 provides a detailed breakdown of the age distribution among 384 respondents. The table is organized into five age groups, each accompanied by the number of respondents in that group and their respective percentages of the total respondent population.

18-24 years: This youngest age group consists of 75 respondents, making up 19.53% of the total. It indicates a notable representation of young adults in the study.

25-31 years: The next age bracket, encompassing early to late twenties, includes 120 respondents, which is 31.25% of the total. This is the largest group, suggesting a significant participation from this age range.

32-38 years: This middle-age group has 105 individuals, constituting 27.34% of the respondents. It represents the second largest group, indicating substantial involvement from this demographic.

39-45 years: The group of respondents in their late thirties to mid-forties consists of 60 people, accounting for 15.63% of the total. This shows a moderate level of participation from this age segment.

Above 45 years: The oldest age group in the study includes 24 respondents, which is 6.25% of the total. This is the smallest group, indicating lesser representation of older adults in the survey.

Overall, the table sums up to a total of 384 respondents, covering a broad age range. The mean age of the respondents is 31.98 years with a standard deviation of 7.92, indicating a moderate variation in the ages of the participants.

Table 02: Distribution of the respondents according to their level of education (n=384)

Level of education	No. of respondents	Percentage
No formal education	40	10.42
Primary	85	22.14
Secondary	115	29.95
Higher secondary	90	23.44
Graduate or above	54	14.06
Total	384	100.00

Table 02 intricately categorizes the educational backgrounds of 384 respondents, reflecting a diverse spectrum of educational attainment within the group. The table reveals that a segment of

the respondents, about 10.42% or 40 individuals, have not received any formal education, highlighting a subset of the population that has possibly relied on informal or experiential learning avenues. In contrast, 22.14% of the respondents, amounting to 85 individuals, have completed primary education, indicating their exposure to foundational academic skills. The largest proportion of the group, 29.95% or 115 respondents, have reached the secondary education level, suggesting they have undergone more advanced and diverse academic training typically offered in middle and high schools. Those with higher secondary education, which often serves as a preparatory stage for tertiary education, constitute 23.44% or 90 of the respondents, pointing to a significant number who have pursued education beyond the basic levels. Finally, the table notes that 14.06% of the participants, translating to 54 individuals, have achieved graduate-level education or higher, underscoring a segment of the population with advanced academic qualifications and potentially specialized skills.

Figure 01: Distribution of the respondents according to their marital status (n=384)

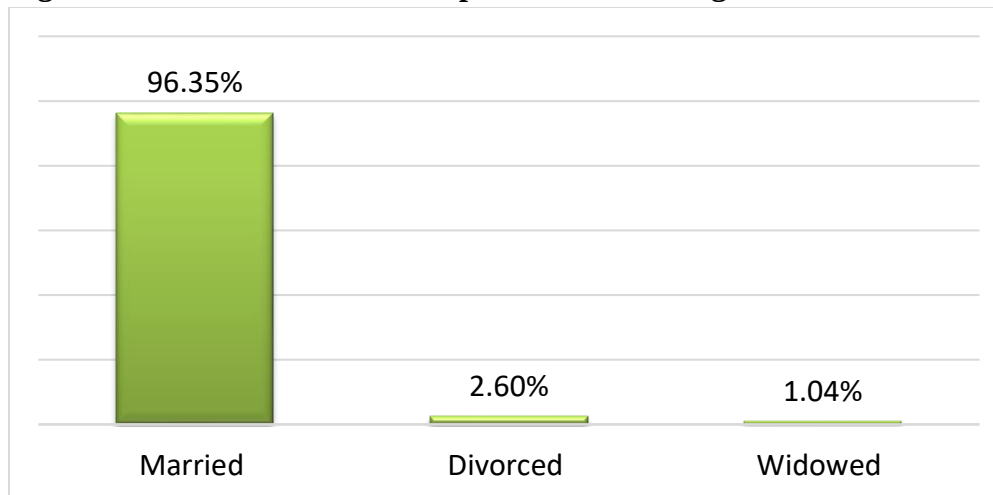


Figure 01 provides a detailed overview of the marital status of 384 respondents in a study. The overwhelming majority of the respondents, 370 individuals or 96.35%, are married. This high percentage indicates that the bulk of the participants are in a state of matrimony, suggesting that the study primarily involves individuals who are engaged in marital life. On the other hand, a smaller segment of the population, comprising 10 respondents or 2.60%, are divorced. This group represents those who have been through the process of legal dissolution of a marriage. An even smaller fraction, 4 respondents or approximately 1.04%, are widowed, indicating they have lost their spouse. The total number of participants adds up to 384, ensuring a complete representation of the sample population.

Figure 02: Distribution of the respondents according to their occupation (n=384)

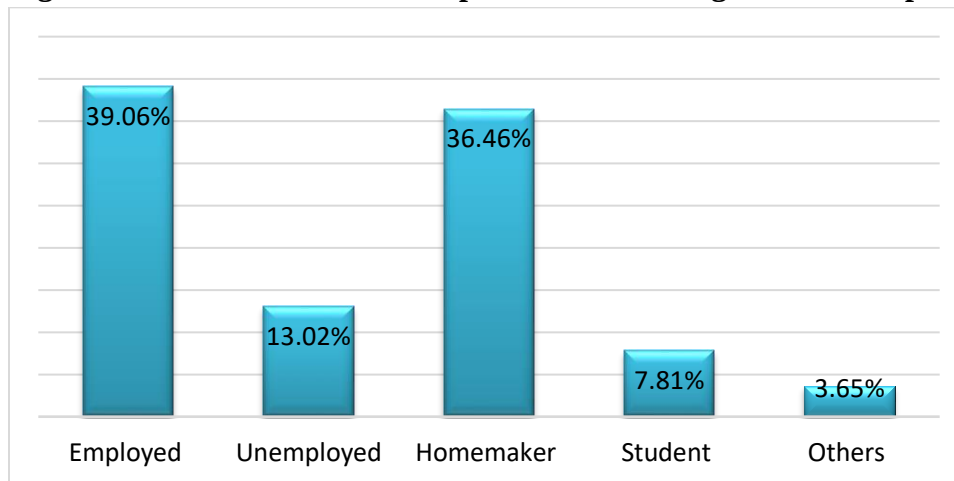


Figure 02 presents a detailed breakdown of the occupations of 384 respondents. The majority, accounting for 39.06% (150 individuals), are employed. This is closely followed by homemakers, who represent a significant portion of the sample at 36.46% (140 individuals). Unemployed respondents constitute 13.02% of the group, totaling 50 individuals. Students are also included, though they make up a smaller fraction at 7.81%, which translates to 30 respondents. Lastly, there is a category labeled 'Others', encompassing a variety of unspecified occupations, accounting for 3.65% of the sample with 14 individuals. The total number of respondents, summing up to 100%, is 384, providing a comprehensive view of the occupational distribution within the surveyed population.

Table 03: Distribution of the respondents according to their monthly household income (n=384)

Monthly household income	No. of respondents	Percentage
< BDT 20000	100	26.04
BDT 20000-30000	140	36.46
BDT 30001-40000	80	20.83
BDT 40001-50000	40	10.42
>BDT 50000	24	6.25
Total	384	100.00

Table 03 illustrates the distribution of monthly household incomes among 384 respondents. The income categories are divided into five distinct brackets. The largest group, comprising 36.46% of the respondents (140 individuals), falls within the income range of BDT 20,000 to 30,000. The next substantial segment consists of those earning less than BDT 20,000, representing 26.04% of the sample, or 100 respondents. Those with monthly incomes between BDT 30,001 and 40,000 account for 20.83% of the participants, totaling 80 individuals. The bracket of BDT 40,001 to 50,000 includes 40 respondents, making up 10.42% of the total. Finally, the smallest group, consisting of 24 respondents (6.25%), reports a household income greater than BDT 50,000.

Figure 03: Distribution of the respondents according to their residence (n=384)

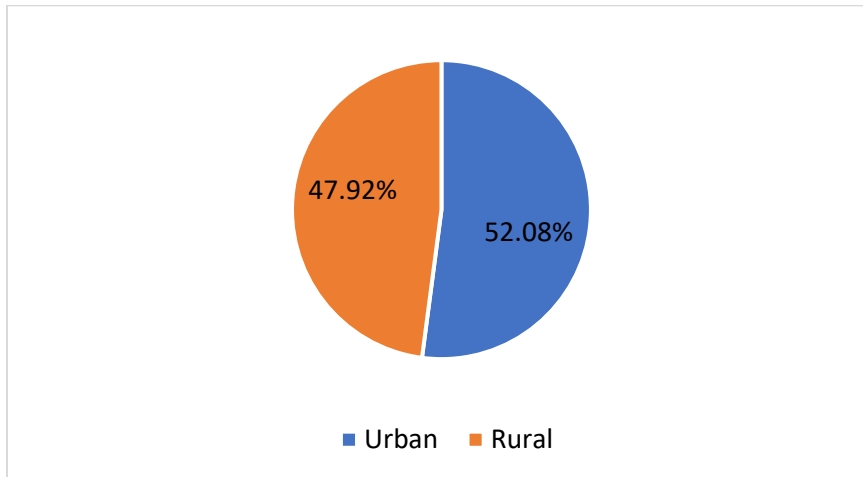


Figure 03 details the residential distribution of 384 respondents. The data is categorized into two primary living environments: urban and rural. A slight majority of the respondents, comprising 52.08% of the total, reside in urban areas, amounting to 200 individuals. Close behind, the rural residents represent 47.92% of the population, with 184 individuals. This near-even split underscores a balanced representation of both urban and rural perspectives within the study.

Pregnancy and health information

Table 04: Distribution of the respondents according to their number of pregnancies (n=384)

No. of pregnancies	No. of respondents	Percentage
1	140	36.46
2	130	33.85
3	80	20.83
>3	34	8.85
Total	384	100.00

Table 04 provides an overview of the distribution of 384 respondents based on the number of pregnancies they have experienced. The data is categorized into four groups. The largest segment comprises individuals who have experienced one pregnancy, representing 36.46% of the total respondents, which equates to 140 individuals. Following closely are those who have had two pregnancies, accounting for 33.85% or 130 respondents. The third group, consisting of individuals with three pregnancies, constitutes 20.83% of the sample, totaling 80 respondents. Lastly, a smaller portion of the population, 8.85% or 34 individuals, have experienced more than three pregnancies.

Figure 04: Distribution of the respondents according to hypertension diagnosis (n=384)

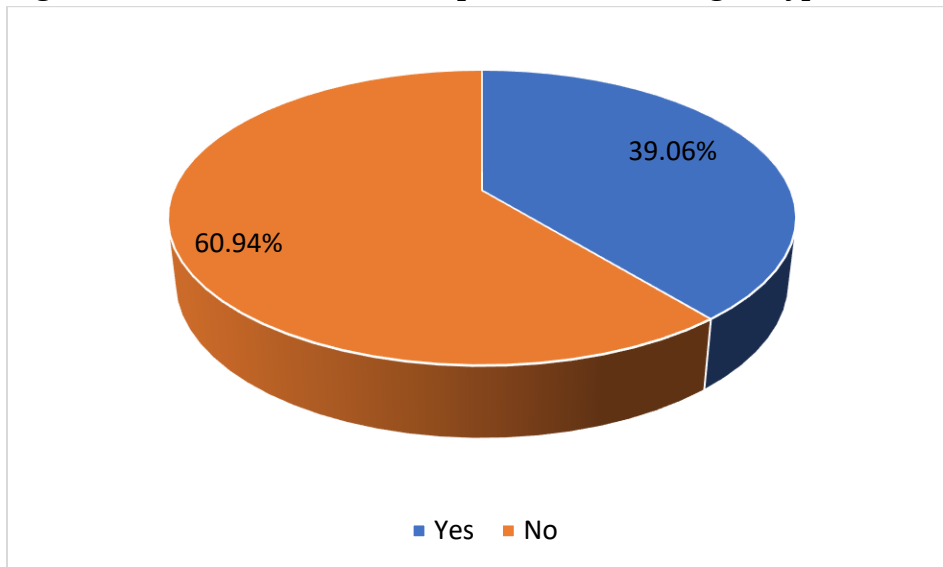


Figure 04 presents the distribution of hypertension diagnoses among 384 respondents. The data divides the respondents into two categories: those diagnosed with hypertension and those without such a diagnosis. A significant portion, amounting to 39.06% or 150 respondents, have been diagnosed with hypertension. In contrast, the majority, constituting 60.94% or 234 individuals, have not been diagnosed with this condition.

Table 05: Distribution of the respondents according to their pregnancy with hypertension diagnosis (n=150)

No. of pregnancies	No. of respondents	Percentage
First	60	40.00
Second	55	36.67
Third	25	16.67
Fourth or later	10	6.67
Total	150	100.00

Table 05 examines the distribution of 150 respondents based on the number of pregnancies they have had, in conjunction with a diagnosis of hypertension. This cohort is divided into four distinct categories reflecting the sequence of their pregnancies. The largest group consists of those diagnosed with hypertension during their first pregnancy, making up 40.00% of this segment, equating to 60 individuals. Following closely are those diagnosed during their second pregnancy, accounting for 36.67% or 55 of the respondents. The third group, comprising individuals who received their hypertension diagnosis during their third pregnancy, represents 16.67% of the sample, totaling 25 individuals. Lastly, a smaller fraction of the population, 6.67% or 10 respondents, were diagnosed with hypertension during their fourth or later pregnancies.

Table 06: Types of hypertensions among the respondents (n=150)

Types of hypertensions	No. of respondents	Percentage
Chronic	40	26.67
Gestational	70	46.67
Preeclampsia	40	26.67
Total	150	100.00

Table 06 provides an analysis of the types of hypertensions among 150 respondents. The data is categorized into three main types of hypertensions: Chronic, Gestational, and Preeclampsia. Gestational hypertension is the most common type among the respondents, with 70 individuals or 46.67% of the group having this condition. Chronic hypertension and Preeclampsia are equally prevalent, each accounting for 26.67% of the respondents. This means that 40 individuals in the survey have been diagnosed with Chronic hypertension, and another 40 with Preeclampsia.

Table 07: C-section recommendation status and the primary reason for the recommendation

Variables	No. of respondents	Percentage
C-section recommendation status (n=384)		
Recommended	112	29.17
Not recommended	272	70.83
Primary reason for C-section recommendation (n=112)		
Hypertension related complications	70	62.50
Baby's health concerns	25	22.32
Previous cesarean delivery	10	8.93
Other medical reasons	5	4.46
Personal choice	2	1.79

Table 07 presents information on the status of C-section recommendations and the primary reasons for these recommendations among a sample of 384 respondents. Firstly, the table addresses the C-section recommendation status. Out of the 384 respondents, 112, or 29.17%, were recommended to have a C-section. The remaining 272 respondents, accounting for 70.83%, were not advised to undergo a C-section.

The table then delves into the primary reasons for C-section recommendations among the 112 respondents who received such advice. The most common reason, cited by 70 respondents (62.50%), is hypertension-related complications. Concerns regarding the baby's health are the next significant reason, accounting for 25 respondents (22.32%). Previous cesarean deliveries are noted as a reason for 10 respondents (8.93%). Other medical reasons, not specified in the table, are cited by 5 respondents (4.46%). Finally, personal choice is the least common reason, with only 2 respondents (1.79%) opting for a C-section for this reason.

Healthcare access and utilization

Table 08: Frequency of prenatal visits among the respondents (n=384)

Frequency of visit	No. of respondents	Percentage
Less than 2 times	85	22.14
3-4 times	125	32.55
5-6 times	100	26.04
More than 6 times	74	19.27
Total	384	100.00

Table 08 focuses on the frequency of prenatal visits among 384 respondents. This table categorizes the respondents based on how many times they visited for prenatal care during their pregnancy. The first group consists of respondents who had fewer than 2 prenatal visits, making up 22.14% of the total, which translates to 85 individuals. The largest group had 3-4 prenatal visits, representing 32.55% of the respondents, amounting to 125 individuals. Another significant portion of the respondents, 100 individuals, had 5-6 prenatal visits, accounting for 26.04% of the total. Lastly, those who had more than 6 prenatal visits constitute 19.27% of the population, equating to 74 respondents.

Table 09: Type of healthcare facility for prenatal visits (n=384)

Type of facility	No. of respondents	Percentage
Public hospital	190	49.48
Private hospital	120	31.25
Community health center	60	15.63
None	14	3.65
Total	384	100.00

Table 09 presents the types of healthcare facilities utilized for prenatal visits by a group of 384 respondents. This table categorizes the respondents based on the type of facility they visited for their prenatal care. The most frequently visited type of facility is the public hospital, with 190 respondents, or 49.48% of the total, choosing this option. Private hospitals are the second most popular choice, used by 120 respondents, which accounts for 31.25% of the group. Community health centers are also a significant option, with 60 respondents, or 15.63% of the total, opting for these facilities. Interestingly, a small portion of the respondents, amounting to 14 individuals or 3.65% of the total, did not visit any healthcare facility for prenatal care.

Table 10: Respondents' level of satisfaction with prenatal care (n=384)

Level of satisfaction	No. of respondents	Percentage
Very satisfied	50	13.02
Satisfied	140	36.46
Neutral	120	31.25
Dissatisfied	50	13.02
Very dissatisfied	24	6.25
Total	384	100.00

Table 10 outlines the levels of satisfaction with prenatal care among 384 respondents. The respondents' satisfaction levels are categorized into five distinct groups. A portion of the respondents, 50 individuals or 13.02%, reported being 'Very satisfied' with their prenatal care. The largest group, comprising 140 respondents, represents those who are 'Satisfied', accounting for 36.46% of the total. A significant number, 120 respondents or 31.25%, expressed a 'Neutral' stance regarding their satisfaction levels. 'Dissatisfied' respondents also constitute 13.02% of the sample, equating to 50 individuals. Finally, those who are 'Very dissatisfied' with their prenatal care make up the smallest group, with 24 respondents or 6.25% of the total.

Table 11: Association between the hypertension status of the respondents and C-section recommendation

Hypertension status	No. of respondents	C-section recommendation status				P-value
		Recommended		Not recommended		
		Freq.	Perc.	Freq.	Perc.	
Hypertension	150	70	46.67%	80	53.33%	0.0031
No hypertension	234	42	17.94%	192	82.06%	

Table 11 analyzes the relationship between the hypertension status of respondents and the recommendations for Cesarean sections (C-sections) in a study of 384 participants. The table is divided into two categories: respondents with hypertension and those without hypertension. In the hypertension group, which consists of 150 respondents, 70 (46.67%) were recommended a C-section, while the remaining 80 (53.33%) were not recommended for a C-section. For the 234 respondents without hypertension, the trend is different. Only 42 of these respondents (17.94%) were recommended a C-section, while a substantial majority, 192 (82.06%), were not recommended for a C-section. The P-value is 0.0031, indicating a statistically significant association between hypertension status and the likelihood of being recommended a C-section.

Chapter V

Discussion

Patients with hypertension face an elevated risk of Cesarean section (C-section) due to the potential complications associated with high blood pressure during pregnancy. Hypertension can lead to conditions such as pre-eclampsia, which significantly increases the risk of placental abruption, intrauterine growth restriction, and preterm birth, necessitating a C-section for the safety of both mother and baby. The decision for a C-section in hypertensive patients is often guided by the severity of hypertension, the presence of end-organ damage, and the fetal condition. Management strategies aimed at controlling blood pressure and monitoring fetal well-being are crucial in mitigating these risks, but in many cases, a C-section may be deemed the safest delivery method to prevent adverse outcomes for both the mother and the infant.

This study explores a cohort of 384 respondents, delving into the intricacies of their socio-demographic profiles, health-related behaviors, and conditions, specifically focusing on pregnancy and hypertension, as well as their interactions with the healthcare system. This comprehensive approach facilitates a nuanced understanding of the various factors influencing maternal health outcomes, thereby contributing valuable insights to the field. The subsequent discussion aims to contextualize these findings within the broader landscape of maternal health research, drawing on relevant literature to underscore similarities, differences, and the implications of these results.

The study's demographic analysis reveals a diverse age distribution, with a significant concentration of respondents in the 25-31 age bracket, indicative of a population at a prime reproductive age. This age distribution is critical for assessing pregnancy outcomes, as maternal age is a known factor influencing both risks and health behaviors. Educational attainment among the respondents spans a broad spectrum, from no formal education to advanced degrees, highlighting the heterogeneity of the study population. This diversity is essential for evaluating the impact of education on health literacy, a factor that Berkman et al. (2011) identify as pivotal in influencing health outcomes and healthcare utilization.

The prevalence and types of hypertensions identified among the respondents—chronic, gestational, and preeclampsia—mirror concerns highlighted by the American Heart Association (2019) regarding the increasing incidence of hypertensive disorders in pregnancy. This aspect of the study enriches the discourse on maternal health, offering a platform for dissecting the risk factors and management strategies pertinent to each hypertension type.

The study meticulously documents healthcare access patterns, including prenatal visit frequency and facility types, providing insights into healthcare-seeking behaviors within the cohort. The reported variability in satisfaction levels with prenatal care, spanning from very satisfied to very dissatisfied, echoes the global challenge of ensuring consistent quality in maternal healthcare services, an issue that has been at the forefront of health policy discussions.

One of the study's significant contributions is elucidating the association between hypertension and C-section recommendations. This finding is particularly resonant with the guidelines from the American College of Obstetricians and Gynecologists, which emphasize the complexity of managing hypertensive disorders in pregnancy and their impact on delivery methods. The

statistical significance of this association highlights the urgent need for targeted clinical interventions.

The demographic trends, particularly the age distribution observed in this study, resonate with findings by Lisonkova et al. (2017), who underscore the impact of maternal age on pregnancy outcomes, including increased risks associated with advanced maternal age. The educational diversity within the study population and its potential implications for health literacy and outcomes align with the narrative presented by Berkman et al. (2011), emphasizing the transformative role of education in health behaviors and access to care.

The study's focus on hypertensive disorders adds a crucial dimension to the existing literature on maternal health, echoing concerns raised by the American Heart Association (2019) regarding the prevalence and management of hypertension in pregnancy. The direct correlation between hypertension and increased C-section recommendations established by the study not only corroborates existing guidelines (ACOG, 2019) but also underscores the need for nuanced management strategies to mitigate the reliance on surgical deliveries.

Chapter VI

Conclusion

The detailed examination of the collected data from 384 respondent's sheds light on the intricate landscape of maternal health, particularly highlighting the pivotal role of hypertension in influencing pregnancy outcomes and the propensity for Cesarean section (C-section) recommendations. The demographic diversity of the study's participants, encompassing a wide range of ages, educational backgrounds, and socioeconomic statuses, provides a rich backdrop against which the multifaceted nature of maternal healthcare challenges can be understood. Notably, the prevalence of hypertensive disorders among the respondents underscores the critical public health issue these conditions represent within the context of pregnancy and childbirth. The association between hypertension and the increased likelihood of C-sections, as revealed by the study, calls attention to the necessity for a nuanced approach to managing hypertensive disorders in expectant mothers. This link not only highlights the direct impact of maternal health conditions on delivery methods but also reflects broader systemic issues related to healthcare access, quality, and patient education. The variability in satisfaction with prenatal care, coupled with the diverse healthcare utilization patterns observed, underscores the need for a patient-centered approach in maternal healthcare services, one that is responsive to the unique needs and circumstances of each expectant mother. Moreover, the findings related to socio-demographic characteristics such as education level and household income point to underlying social determinants of health that may influence healthcare access and outcomes. These elements suggest that interventions to improve maternal health outcomes cannot be one-dimensional but must instead address a constellation of factors, including healthcare infrastructure, education, and socioeconomic disparities. In conclusion, the study's findings provide compelling evidence of the complex interplay between socio-demographic factors, health conditions such as hypertension, and healthcare service utilization in the realm of maternal health. The significant correlation between hypertensive disorders and C-section recommendations highlights a critical area for intervention, suggesting the need for a multifaceted strategy that encompasses medical, educational, and systemic approaches to improve maternal and neonatal health outcomes.

Recommendations

- a. Enhanced prenatal screening for hypertension, early initiation of appropriate management strategies, and continuous monitoring throughout the pregnancy can be helpful to mitigate risks associated with high blood pressure.
- b. Educational programs focused on health literacy, specifically addressing the importance of prenatal care, the risks associated with hypertensive disorders during pregnancy, and the potential implications for delivery methods should be developed and implemented.
- c. Efforts should be made to improve access to healthcare services, especially for those residing in rural areas or those with limited financial resources.
- d. The variability in satisfaction levels with prenatal care calls for initiatives aimed at improving the quality of maternal healthcare services. This could include the training of healthcare professionals in patient-centered care practices, the introduction of quality control mechanisms in healthcare facilities, and the establishment of feedback loops to incorporate patient experiences into service improvement plans.

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