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**PREVALENCE AND AWARENESS OF HYPERTENSIVE DISORDERS
AMONG PREGNANT WOMEN: A STUDY AT THE INSTITUTE OF
CHILD AND MOTHER HEALTH (ICMH), DHAKA, BANGLADESH**

A PROJECT REPORT

BY

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Submitted to the Department of Nutrition and Food Engineering in the partial fulfillment of
B.Sc. in Nutrition and Food Engineering

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APPROVAL

This Project titled “**Prevalence and awareness of hypertensive disorders among pregnant women: A study at the Institute of Child and Mother Health (ICMH), Dhaka, Bangladesh**”, submitted by Sadia Ali Rafa to the Department of Nutrition and Food Engineering, Daffodil International University. It has been accepted as satisfactory for the partial fulfillment of the requirements for the degree of B.Sc. in Nutrition and Food Engineering and approved as to its style and contents.

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We hereby declare that we have done this project under the supervision of **Dr. Nasima Akter Mukta, Assistant Professor, Department of Nutrition and Food Engineering** at Daffodil International University. We also declare that neither this project nor any portion of this project has been submitted elsewhere for earning any degree or certificate.

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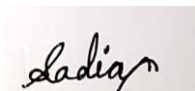
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ABSTRACT

Pregnancy-induced hypertension (PIH) is characterized by elevated blood pressure levels that occur specifically during pregnancy. PIH leads to both maternal and neonatal complications such as premature birth, intrauterine growth retardation (IUGR), and low birth weight. Maternal mortality accounts for 10-15% of maternal deaths in developing countries. According to WHO 2018, the rate of stillbirth is 21.9 per 1000 births in women with pregnancy-induced hypertension (PIH). A cross-sectional study was conducted. Interviewer-administered questionnaires were used to capture demographic data, obstetric history, food habits, knowledge, and awareness of PIH management. The study was conducted from December 2023 to January 2024. The 200 pregnant women with or above 20 weeks of gestational period come to visit the doctor at a hospital named Institute of Child and Mother Health (ICMH), Matuail, Dhaka, Bangladesh. In the study, 73% of the pregnant women had heard about PIH and 24% of pregnant women had PIH. Also, 36.50% of pregnant women experience PIH in their previous pregnancy. Age group more than 31 and 25-30 are more knowledgeable and aware compared to other age group. Most of the pregnant mothers have poor knowledge and awareness of PIH. A large percentage of the women who expecting a baby have poor knowledge of management and awareness of Pregnancy including hypertension. For that, early diagnosis and treatment through regular antenatal checkups are key factors in preventing hypertensive disorder during pregnancy. Healthcare promoters should improve health educational programs in clinics or hospitals and community-based campaigns also can be helpful for those who do not have any formal education, who have low family income, and housewives.

TABLE OF CONTENT

NAME OF CONTENTS	PAGE NUMBER
APPROVAL	i
DECLARATION	ii
ACKNOWLEDGMENT	iii
ABSTRACT	iv
TABLE OF CONTENT	v - vi
CHAPTER ONE: INTRODUCTION	1 – 3
1.1 Introduction	1 – 2
1.2 Background	2 - 3
1.3 Objective	3
CHAPTER TWO: LITERATURE REVIEW	4 - 7
2.1 Literature Review	4-7
CHAPTER THREE: MATERIALS AND METHODS	8 – 10
3.1 Methodology	8
3.1.1 Study Design	8
3.1.2 Study Population	8
3.1.3 Study Site	8
3.1.4 Study Period	8
3.1.5 Sample Size Calculation	8 – 9
3.1.6 Data Collection Method	9
3.1.7 Content of Questionnaire	9
3.1.8 Data Collection Tools	9
3.1.9 Data Collection Techniques	9
3.1.10 Data Analysis	9
3.1.11 Limitation	10
3.1.12 Ethical Clearance	10
CHAPTER FOUR: RESULT	11 – 19
4.1 Personal Information of Patient	11 – 12
4.2 Health Status of Pregnant Mothers	12 – 13
4.3 Obstetrical History	13 – 14
4.4 Knowledge of Hypertension During Pregnancy	14 – 16
4.4.1 Factor Associated with Awareness of PIH	16
4.4.2 Factor Associated with Knowledge of PIH	17
4.5 Habituate of Food Among Pregnant Women	18

CHAPTER FIVE: DISCUSSION	19 – 20
CHAPTER SIX: CONCLUSION AND RECOMMENDATION	21
6.1. Conclusion	21
6.2. Recommendation	21
REFERENCE	22 – 24
APPENDIXES	25 - 32
APPENDIX I	25 - 28
APPENDIX II	29 - 31
APPENDIX III	32

LISTS OF FIGURES

FIGURES	PAGE
Figure 1: Classification of Hypertension disorder in Pregnancy	1
Figure 2: Potential underlying mechanisms for association between hypertensive disorders of pregnancy.	5
Figure 3: Management strategies for hypertensive pregnant mother	7

LISTS OF TABLES

TABLES	PAGE
4.1.1: Patients personal information:	11 – 12
4.2.1: Health status of pregnant mothers	13
4.3.1: Obstetrical history	14
4.4.1: Knowledge of hypertension during pregnancy (PIH)	15 – 16
4.4.2: Factors associated with awareness about PIH	16
4.4.3: Factors associated with knowledge about PIH	17
4.5.1: Food habit	18

CHAPTER ONE

INTRODUCTION

1.1 Introduction

The state of carrying the inserted outcomes for up to 41 weeks of being conceived, whether inside the uterus or otherwise in the body, is designated as pregnancy. It culminates via a voluntary or spontaneous abortion or childbirth. Intending to nourish the embryo's growth, the woman's body undertakes substantial modifications during this time which influence every component of the function (Pascual & Langaker., 2023).

The occurrence of a recurring rise in regional arterial pressure that goes above a specific limit value is frequently employed as an indicator of hypertension. A systolic blood pressure (SBP) of more than 130 mm Hg or elevated and/or diastolic blood pressure, also known as DBP, of more than eighty millimeters per second is currently deemed to be a warning sign of hypertension (HTN). Arguably the most prominent long-term disease, hypertension can be described by an ongoing spike in blood vessel pressure (Iqbal & Jamal., 2023).

Preeclampsia-eclampsia is particular to pregnancy, it shows up with expanding recurrence as pregnancy approaches term; it is unusual before the end of the second trimester. Eclampsia is convulsions in women with pre-eclampsia; epilepsy and other convulsive disorders must be excluded (LEONC.CHESELEY, 1980).

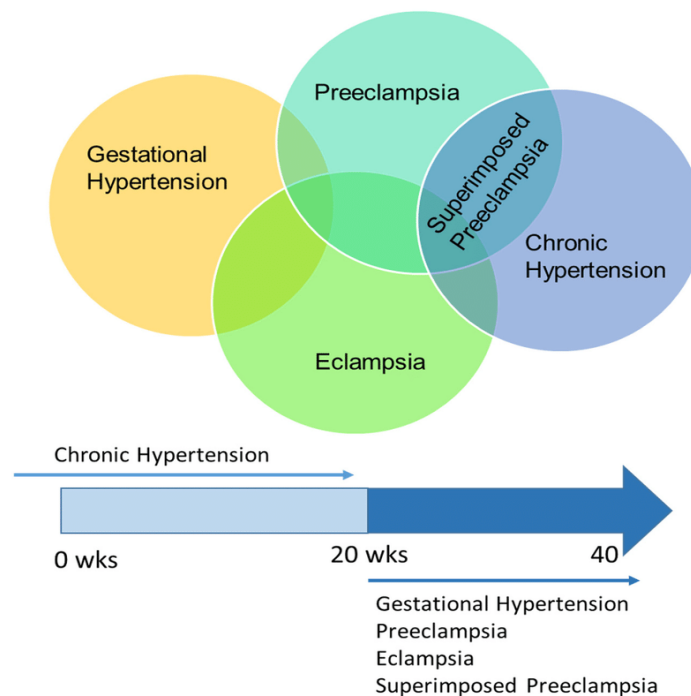


Figure 1: Classification of Hypertension disorder in Pregnancy (Maria Jones-Muhammad, 2019)

Classification of hypertension in pregnancy:

- **Preeclampsia**

Elevated systolic blood pressure of 140 mm Hg or higher, or diastolic blood pressure of 90 mm Hg or higher, after 20 weeks of pregnancy in a woman who was previously not hypertensive.

Proteinuria (elevated protein in the urine) of 300 mg or more in a 24-hour urine sample.

- **Gestational hypertension**

In a woman who was previously normotensive, if the systolic blood pressure is equal to or greater than 140 mm Hg or the diastolic blood pressure is equal to or greater than 90 mm Hg after 20 weeks of gestation, it is considered hypertension without proteinuria.

- **Chronic hypertension**

Blood pressure readings of 140 mmHg or higher for systolic, or 90 mmHg or higher for diastolic, before the 20th week of pregnancy.

- **Preeclampsia superimposed on chronic hypertension**

Proteinuria that is either newly developed or significantly amplified.

Sudden exacerbation of hypertension or other signs of multisystem involvement such as thrombocytopenia or transaminases in a woman with prior hypertension (Caren G. Solomon, 2006).

1.2 Background

Pregnancy induced hypertension is a burning issue all over the world. Preeclampsia is the most common of the hypertensive complications of pregnancy, complicating 5%-10% of all pregnancies, and is a leading cause of maternal morbidity and mortality, as well as fetal and neonatal complications. Hypertensive disorders are the leading causes of maternal-fetal morbidities and mortalities (Tesfaye Abera Gudeta, 2019). Different studies discovered that maternal history of PIH, pre-existing diabetes, gestational diabetes mellitus, and maternal age ≥ 40 years, multiple pregnancies, and obese before pregnancy, pre-pregnancy body mass index was positively correlation with the risk of gestational hypertension. The four categories of hypertensive disorders in pregnancy (HDP) are chronic hypertension, preeclampsia-eclampsia, gestational hypertension, and chronic hypertension-superposed preeclampsia. Numerous factors, including healthcare systems, social, cultural, and economic aspects, as well as age, occupation, higher parity, family dynamics, gravida, pregnancy difficulties, and education level, are known to be linked to HDPs (Pauline Boachie-Ansah, 2023). Research has indicated that an individual's awareness of their ailment can impact their propensity to seek medical attention at an early age and adhere to treatment plans, ultimately leading to an early diagnosis and averting pregnancy-related complications, such as mortality. Ignorance of HDPs may

result in misconceptions, such as misinterpreting warning symptoms as "spiritual attacks" or as something that happens regularly throughout pregnancy (Aisha N. Adamu, 2023). While maternal serum AQP9 concentrations have been linked to early-onset preeclampsia, the etiology of HDPs is still unknown, and treatment focuses mostly on symptom relief for the mother. Over time, the use of authorized pharmacotherapeutics, routine blood pressure monitoring, and other non-pharmacological preventive strategies have been used to control HDPs. Preeclampsia in particular is linked to HDPs and higher hazards for expectant mothers and babies (Pauline Boachie-Ansah, 2023). In the differential diagnosis of any hypertension starting at 20 weeks of gestation, preeclampsia is included. First, up to 35% of women with prenatal hypertension (particularly if it begins before 34 weeks) may advance to preeclampsia, and up to 25% of women with chronic hypertension may develop superimposed preeclampsia. Second, endothelial cell dysfunction and hypertension itself can cause unfavorable consequences in almost any organ system when endo-eclampsia is present (P Rachael James, 2004). Preeclampsia is the HDP linked with the highest risk of problems. Also treating preeclampsia requires tight interdisciplinary cooperation and goes beyond antihypertensive medication. Pregnant women should be the focus of research because there is a danger of injury to the fetus as well as the mother from HDPs. HDPs are now viewed as windows into the woman's future health that require integrated care, coordinating treatment to identify risk factors and remedy them, rather than as "transitory diseases cured by delivery" (Farah Nawabi, 2022).

1.3 Objective

1.3.1 General objective:

The worldwide incidence of hypertension diseases during pregnancy continues to increase and is related to maternal mortality.

1.3.2 Specific objective:

- Estimation of the prevalence of hypertension in pregnancy.
- Assessment of awareness regarding PIH.
- Observations of food habits.
- Association of the Knowledge of hypertension in Pregnancy with socio-demographic status

CHAPTER TWO

LITERATURE REVIEW

2.1 Literature review

A global over-arching concern is the very high burden of maternal mortality in developing countries. (World Health Organization [WHO], 2012). In 2012, an estimated 287,000 women died in pregnancy and childbirth, and 99% of these deaths occurred in developing countries. A woman in these regions was fourteen times more likely to die during pregnancy and childbirth than a woman in the developed regions of the world. Our world has a responsibility to these women and children to provide high-quality health care with some dignity to ensure the decrease of mortality for these preventable conditions. Hypertension during pregnancy contributes to 16% of global maternal mortality which is common in developed countries (Oshvandi et al., 2018). In the US, preeclampsia for 15–17.6% of maternal deaths. In India, pregnancy-induced hypertension resulted in 12% of maternal deaths which were documented through a study by Joseph, Nayak, fernandes, and Suvarna, 2013 (Sr. Jolly Joseph, 2013). Background: This study was done in Dhaka, Bangladesh, to find out the prevalence of pregnancy-induced hypertension. Hypertension disorders of pregnancy include hypertension complicates 10% of all pregnancies, and pre-eclampsia and eclampsia are the main causes of maternal and neonatal morbidity and mortality. The 2020 International Society of Hypertension guidelines maintain the four-category HDP classification scheme, which places hemolytic anemia, elevated liver enzymes, and low platelet count syndrome (HELLP syndrome) in their own category because HDP is thought to be linked to cardiovascular diseases (Thomas Unger, 2020). The significance of blood pressure monitoring throughout pregnancy is stressed, regardless of the classification given to HDP. According to recent data, the incidence rate of HDP has increased over the previous several decades (Karina Bilda de Castro Rezende, 2016), indicating that HDP, a cardiovascular illness that is particular to a person's sex, will likely become more significant in the future (Cande V Ananth, 2013). A few review publications from recent years have reported the burden of HDP based on a small number of country studies; however, comprehensive data from all nations has not been supplied. This study's main objective was to identify the epidemiological features of HDP in a population-based cohort in Bangladesh. The epidemiology of HDP is poorly studied, particularly in less developed nations, despite the recognition of HDP's significance in risk assessment and prevention programs. This knowledge gap could potentially impede HDP prevention and appropriate gestational healthcare approaches. One of the top three global causes of maternal morbidity and death, the incidence of HDP varies from 4 to 25%. In industrialized nations, preeclampsia incidence and maternal mortality have sharply declined during the previous 50 years. Maternal mortality and preeclampsia incidence rates are still relatively high in poor nations (Zoet Gerbrand A, 2015).

It has been observed that women with pregnancy-induced hypertension are more sensitive to endogenous chemicals that might produce vasospasm and platelet aggregation, such as prostaglandins and thromboxane. The central nervous system is impacted by thrombus formation or hemorrhage, which can cause headaches, localized neurological impairments, and seizures. Proteinuria and a reduced glomerular filtration rate are the results of renal necrosis. Elevated liver function tests and right upper quadrant pain are symptoms of liver injury from hepatocellular necrosis. A lower-than-normal intravascular volume, an increased cardiac output, and an abnormally raised peripheral vascular resistance are examples of cardiovascular symptoms. Thrombocytopenia and anemia are the results of microangiopathic hemolysis. Fetal mortality and intrauterine growth retardation are the results of placental infarction and abruption of placentae. Preeclampsia is characterized by a broad range of clinical signs and symptoms (Jan H.W. Veerbeek, 2015).

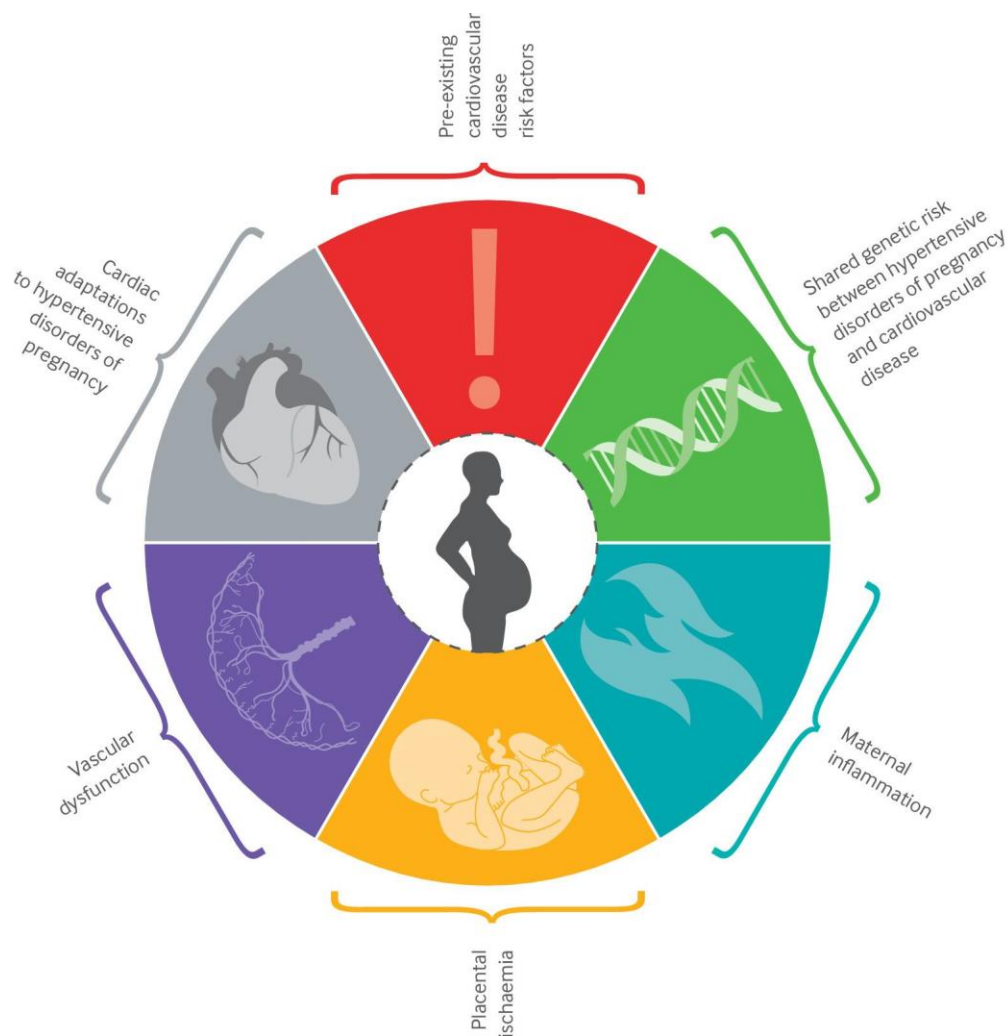


Figure 2: Potential underlying mechanisms for association between hypertensive disorders of pregnancy. (Pensée Wu, 2021)

Hypertensive pregnancy disorders are a primary cause of morbidity and mortality among mothers in Bangladesh. Information on the occurrence of this ailment, such as blood pressure, albuminuria, edema, vaccination history, and prenatal care, would be recorded according to a set timetable. In most underdeveloped nations, including Bangladesh, these disorders jeopardize the outcome of pregnancies, even though their impact on women and fetuses has been lessened in wealthy nations by appropriate prenatal care. Pregnant women who receive inadequate education, prenatal care, and nutrition are at a higher risk of developing hypertension problems. Bangladesh is a densely populated nation that also has a remarkably high percentage of maternal mortality from avoidable causes (Saha MR, 2011).

The results of hypertensive pregnancy disorders on the mother or fetus depend on several variables, especially if the early stages of pregnancy were marked by high blood pressure. Pregnancy-related hypertension, which includes preeclampsia in infancy, is a frequent and dangerous pregnancy condition. Pregnancy-induced hypertension may be influenced by insulin resistance, which is linked to critical hypertension, according to new research. Hypertensive pregnancy may be more likely in cases of conditions including obesity, ovarian syndrome, and gestational diabetes that increase insulin resistance. Pre-eclampsia is attributed to high rates of perinatal mortality and morbidity, primarily as a result of early pregnancy termination. The signs of persistent hypo-perfusion of the placenta (Victoria M Allen, 2004).

High rates of maternal and perinatal death during pregnancy are both extremely risky and quite common. Screening should take place at antenatal visits to protect against the risks associated with preeclampsia in pregnancy. In addition to being the major cause of maternal and perinatal mortality in developing nations, Bangladesh is one of the developed nations without adequate prenatal care facilities. In Bangladesh, eclampsy is still a significant issue in obstetrics, even though it is becoming less common and more preventable in developing nations. Even though the precise cause is yet unknown, appropriate prenatal care might reduce the likelihood of complications. Our nation suffers from a wide range of illnesses as a result of early marriage, poor prenatal care, and increased pregnancy rates. Early detection and treatment, can lessen the complication. In light of this, the purpose of this study was to identify the hypertension illnesses that affect Bangladeshi pregnant women (Abadi Kidanemariam Berhe, 2020).

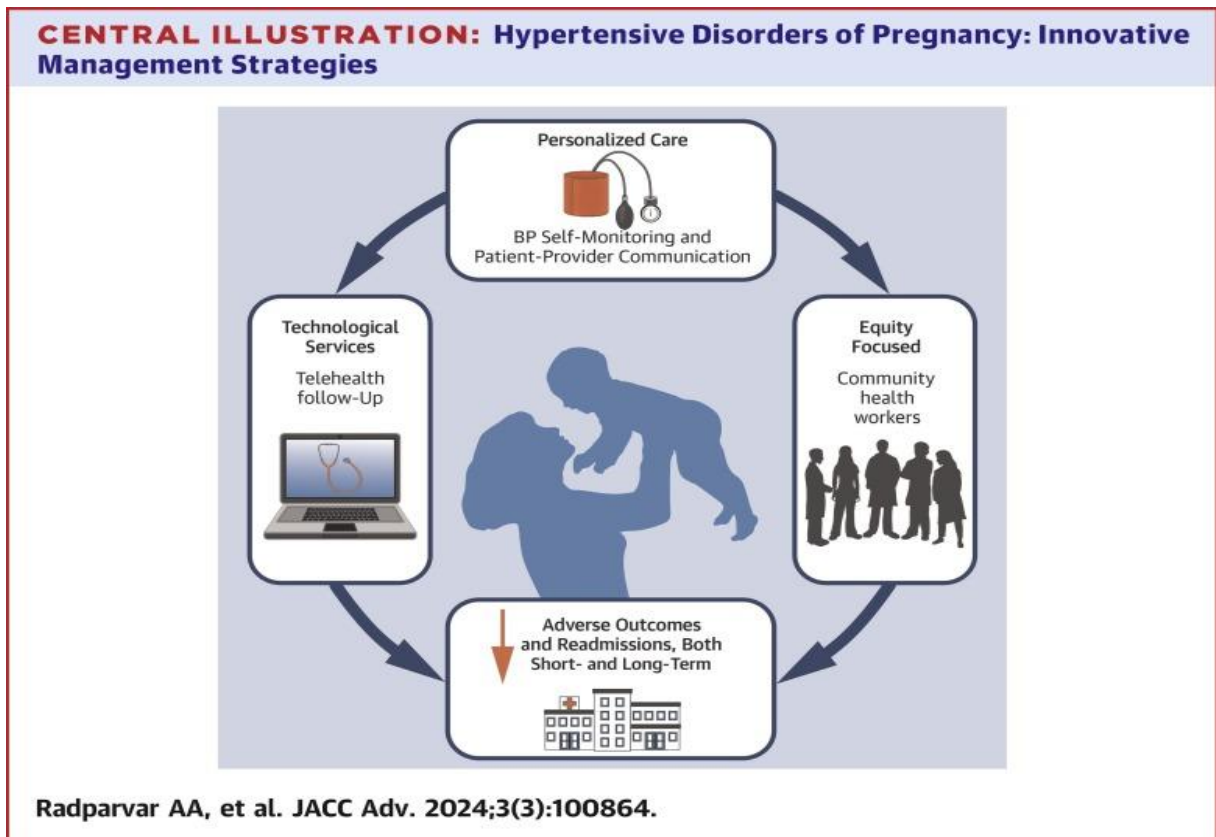


Figure 3: Management strategies for hypertensive pregnant mother (Ashley A. Radparvar, 2024)

Women with hypertensive disorders during pregnancy were more likely to experience inadequate prenatal care, inadequate education, and poor nutrition, an increase in cesarean sections, premature placenta abruption, preterm delivery, low birth weight, stillbirth, acute renal failure, and intravascular coagulation. In Bangladesh, a nation with a dense population, maternal mortality has climbed to an abnormally high rate because of avoidable causes. Maternal care is inadequate in poor nations such as Bangladesh. In Bangladesh, the minimum number of visits required for prenatal treatment is 48.7%. Early identification of PIH-associated factors and appropriate governmental action can improve the situation overall (Md. Mahedi Hasan, 2021).

CHAPTER THREE

MATERIALS AND METHODS

3.1 METHODOLOGY

3.1.1 Study Design

It was a descriptive type of cross-sectional study to estimate the prevalence and knowledge of hypertension disorders among pregnant women.

3.1.2 Study Population

The women who were pregnant on or above 20 weeks of gestation registered as outdoor patients at the hospital at a point in time. But pregnant mother who was critically ill could not respond to the interview.

3.1.3 Study site

The study was conducted in a hospital named Institute of Child and Mother Health (ICMH), Matuail, Dhaka, Bangladesh

3.1.4 Study period

The study was conducted from December 2023 to January 2024

3.1.5 Sample size calculation and sampling procedures

The sample size for the study's female participants was determined using the formula for estimating sample size for a single proportion as follows:

$$n = z^2 \times pq / d^2$$

Here z is the critical value at a 95% confidence interval which is 1.96.

p is the prevalence of PIH among pregnant mothers which is 24.9% (Monica Muti. Mufuta Tshimanga, 2015).

q = 1-p that means 0.751

d is the degree of absolute precision, usually at 5%.

$$n = (1.96)^2 \times (0.249 \times 0.751) / (0.05)^2$$

$$= 0.71838 / (0.05)^2$$

$$= 287.35$$

For this study required sample size was 287. However, due to some inclusion criteria such as women who were pregnant with or above 20 weeks of gestation, we have collected only 200 samples from the hospital. Interviewers approached respondents at different times throughout the day while collecting data. Participants who did not answer all questions and exited before finishing the interview were excluded.

3.1.6 Data collection method

Data was collected by interviewing the patient and reviewing records. First, the patient was made to understand the objective of the study. The interviewer then filled out the questionnaire, which included personal information, the health status of pregnant mothers, obstetrical history, and knowledge about PIH.

3.1.7 Content of Questionnaire

Data were collected via a structured questionnaire for this study which was derived from the literature review of the previous peer-reviewed published studies (Fatama T. Zohora, Evaluation of knowledge, awareness, treatment and prevention towards pregnancy induced hypertension among the pregnant women in Bangladesh: a hospital based cross-sectional study, 2022) (Pugie Tawanda Chimberengwa M. N., 2019), (Monica Muti. Mufuta Tshimanga, 2015). Firstly, the questionnaire was developed in the English language after that it was translated into Bengali language.

The questionnaire has five sectors. The first sector consists of eleven questions that covered with Socio-demographic information. The second sector consists of seven questions that cover with health status of pregnant women. The third sector is about obstetrical history which consists of eleven questions. The fourth sector was composed of eleven questions that covered knowledge about PIH, awareness, management, and prevention of PIH. The last sector is about the habituation of food among pregnant women which has four questions to cover. All five sectors are mostly closed-ended questions ‘yes’, ‘no’, ‘don’t know’, or multiple-choice questions but the health status vary person to person.

3.1.8 Data collection tool

The translated version of the question was printed.

3.1.9 Data collection techniques

Face-to-face interview with the pregnant mother. I was on the field, firstly I introduced myself and then explained to them the purpose, and importance of the study. All the questions were asked of the pregnant mother and filled out by the interviewer.

3.1.10 Data analysis

Data analysis was carried out using Statistical Package for Social Sciences (SPSS).

3.1.11 Limitation

- Since this was a cross-sectional study, the subjects were not monitored after just one visit. The likelihood that certain subjects could have developed hypertension later in their pregnancy cannot be dismissed.
- This study was a hospital-based study of ICMH, The results of the study on antenatal checkups might not accurately represent the true situation across all of Bangladesh.
- Many patients did not bring their previous checkup records or they were not included in the study.
- Women who are in their first trimester must be excluded. Only women with equal or more than 20 weeks are included.
- Tried to take the maximum number of people who have high blood pressure during the study.
- Some women were not interested in answering such questions about their previous pregnancy and their food habits.
- Time shortage was a big problem during data collection.

3.1.12 Ethical consideration

Ethical approval and clearance for the study obtained from the Faculty of Health and Life Sciences- Research Ethics Committee (FHLS-REC) of Daffodil International University. A Consent was received from Institute of Child and Mother Health (ICMH) to interview their outdoor and indoor pregnant patient for this study. The confidentiality and anonymity of participants in the study were guaranteed. Informed consent in writing was obtained from the participants before data collection began.

CHAPTER FOUR

RESULT

4.1 Socio-demographic Information of Patient

The table describes the descriptive data of 200 participants where the majority of the respondents 82 (41%) were in the age group of (19-24) years, followed by 70(35%) respondents from the age group (25-30) years, 27 (13.5%) in equal less than 18 years and 21 (10.5) in the age group of equal great than 31 years.

Most women manage to study up to primary education level 80 (40%), secondary educated women 40 (20%), higher secondary 31 (15.5%), Bachelor's Degree 31(15.5%), and Bachelor's Degree or higher 12(6%). Otherwise, a very small number of women 6(3%) did not manage to go to an educational institution for some reason.

More than 80 percent of women responded they are housewives 164(82%) and students 21(10.5%). 18 out of 200 women respond they are not only dependent, they also earn their own. The majority of people (37%) belong to middle-class families. In addition majority of women were Islam 97% in religion. (Table: 4.1.1)

Table 4.1.1: Patients' socio-demographic information

Variables		Frequency	Percentages
Age	≤ 18	27	13.5
	19 – 24	82	41
	25 – 30	70	35
	≥ 31	21	10.5
Education level of women	Illiterate	6	3
	Primary	80	40
	Secondary	40	20
	Higher Secondary	31	15.5
	Bachelor's Degree	31	15.5
	Bachelor's Degree or Higher	12	6
Occupation	Housewife	164	82
	Student	21	10.5
	Job holder	12	6
	Business	3	1.5
Spouse Education Level	Illiterate	14	7
	Primary	42	21
	Secondary	44	22

	Higher Secondary	39	19.5
	Bachelor's Degree	34	17
	Bachelor's Degree Or Higher	27	13.5
Spouse occupation	Job holder	104	52.00%
	Business	63	31.50%
	Unemployed	3	1.50%
	others	27	13.50%
	Job holder + Student	2	1.00%
	Unemployed + student	1	0.50%
Religion	Islam	194	97.00%
	Hindu	6	3%
Socioeconomic Status	Low	61	30.50%
	Middle	74	37.00%
	High	65	32.50%
Number of family member	5 - 7	110	
	≤ 4	64	
	≥ 8	26	

4.2 Health Status of Pregnant Mothers

Based on BMI 90 (45%) pregnant women were in the normal weight range, 69 (34.5%) pregnant women were overweighted, 30 (15%) were obese and 11 (5.5%) underweighted. After measuring blood pressure, in accordance with systolic blood pressure and diastolic blood pressure, 48 (24%) pregnant mothers had Pregnancy included Hypertension, 31 (15.50%) Pregnant mothers had low blood pressure when other 121 (60.50%) had normal blood pressure. About 50(25%) of pregnant mothers were suffering from anemia while 1 (0.5%) was reported as a thalassemia patient. 11 (5.5%) women had diabetes for a long time but 25 (12.5%) pregnant women reported they had gestational diabetes. When they were asked if they have any other diseases 15 (7.5%) pregnant women responded they have thyroid. (Table: 4.2.1)

Table 4.2.1: Health status of pregnant mothers

Variable		Frequency	Percentage
Body Mass Index (BMI)	Underweight	11	5.5%
	Normal	90	45%
	Overweight	69	34.5%
	Obese	30	15%
Blood pressure status	Normal	121	60.50%
	High	48	24.00%
	Low	31	15.50%
Anemia	No	149	74.5%
	Thalassemia	1	0.5%
	Have	50	25%
Diabetes	No	164	82%
	Gestational Diabetes	25	12.5%
	Have Diabetes	11	5.5%
Cardiac Disease	No	200	100%
	Yes	0	0
Kidney Disease	No	200	100%
	Yes	0	0
Any other	Thyroid	15	7.5%

4.3 Obstetrical History

Among the pregnant mothers, gravida 3 and above were the highest 69 (34.5%) followed by primi 68 (34%) and gravida 2 were 63 (31.5%). The majority 130 (65%) pregnant women respond they visit 3 or more than 3 times for antenatal care. More than two-thirds of mothers had not experienced cesarean section earlier, more than 84% of mothers had not experienced preterm delivery, and less than two-thirds of responders responded they did not have any history of gestational hypertension. 105(52.5%) and 95 (47.5%) responders shared they have a family (parenteral and maternal) history of high blood pressure, and only 46(23%) had a family history of miscarriage or stillbirth. (Table: 4.3.1)

Table 4.3.1: Obstetrical history

Variable		Frequency	Percentage
Gravida	Gravida 3 and above	69	34.5
	Primi	68	34
	Gravida 2	63	31.5
Number of Antenatal Care Visits	3 or more	130	65
	Less than 3 (< 3)	70	35
Previous Cesarean Section	Yes	62	31.00%
	No	138	69.00%
Previous Preterm Delivery	Yes	31	15.50%
	No	169	84.50%
Previous Gestational Hypertension	No	127	63.50%
	Yes	73	36.50%
Family History of Paternal High Blood Pressure	No	95	47.50%
	Yes	105	52.50%
Family History of Maternal High Blood Pressure	No	105	52.50%
	Yes	95	47.50%
History of Miscarriage	No	154	77.00%
	Yes	46	23.00%
History of Stillbirth	No	188	94.00%
	Yes	12	6.00%
Family History of (mother, mother-in-law) of any miscarriage	No	154	77.00%
	Yes	46	23.00%
Gestational Age (Weeks)	> 20 week	153	76.50%
	20 week	47	23.50%

4.4 Knowledge of Hypertension During Pregnancy (PIH)

Of the 200 pregnant mothers, 146 (73%) mothers have heard about PIH. Almost half of the participants informed they had known about PIH from healthcare promoters.

More than one-third (36.50%) of participants don't know when PIH can start. Other 38.50% of participants believe it can occur before and during pregnancy (from the 1st trimester) and 25% say it can occur after 20 weeks of pregnancy. Most of the pregnant mothers know 165 (82.50%) about the signs and symptoms of pregnancy including hypertension on the other hand 35 (17.50%) women did not know. Out of 200 pregnant women also more than two-thirds of women 131 (65.50%) do not know complications in PIH. 135 (67.50%) pregnant women thought PIH was preventable while 65 (32.50%) disagreed. less than one-fourth 42 (21.00%) pregnant women did not have any awareness of the management of PIH while 158 (79.00%)

pregnant women were aware of the management of PIH. Meanwhile, more than half 116 (58.00%) pregnant women were not aware of treatment of PIH also 176 (88.00%) pregnant women did not have any medication side effect awareness.

98 (48%) pregnant women stated weight loss before conception can prevent Pregnancy including hypertension. Similarly, 78 (39.00%) pregnant mothers stated regular exercise can also prevent PIH. (Table: 4.4.1)

Table 4.4.1: Knowledge of hypertension during pregnancy (PIH)

Variable		Frequency	Percentage
Ever heard about Pregnancy Included Hypertension	No	54	27.00%
	Yes	146	73.00%
Source of Hypertension Knowledge	No	53	26.50%
	Health care promoters	77	38.50%
	Health care promoters + Relative and friends	24	12.00%
	Relative and friends	5	2.50%
	Internet + Relative and friends	11	5.50%
	Internet	6	3.00%
	Internet + Health care promoters	13	6.50%
	Others	3	1.50%
	Internet + Relative and friends + Health care promoters	8	4.00%
Perceived Hypertension Onset Timing	Do Not know	73	36.50%
	After 20 weeks of pregnancy	50	25.00%
	Before and during pregnancy	77	38.50%
Symptoms/Signs Recognition	No	35	17.50%
	Yes	165	82.50%
Knowledge of Hypertension Complications	No	131	65.50%
	Yes	69	34.50%
Hypertension Prevention Knowledge	No	65	32.50%
	Yes	135	67.50%
Hypertension Management Awareness	No	42	21.00%
	Yes	158	79.00%
Hypertension Treatment Awareness	No	116	58.00%
	Yes	84	42.00%
Medication Side Effects Awareness	No	176	88.00%
	Yes	24	12.00%
I do not know		46	23.00%

Exercise for Prevention Belief	Yes	78	39.00%
	No	76	38.00%
Weight Loss for Prevention Belief	I do not know	82	41.00%
	No	22	11.00%
	Yes	96	48.00%

4.4.1 Factor Associated with Awareness of PIH:

Table 4.4.3 interprets, that there was also a factor association between maternal age, education level, occupation, and awareness of PIH. Age group 25-30 and more than 31 age group pregnant women are aware of PIH compared to other age group. (Table: 4.4.3)

Table 4.4.2: Factors associated with awareness about PIH

Variable	Exercise can prevent PIH.			P- value	Weight loss can prevent PIH?			P-Value
	Yes	No	Don't know		Yes	No	Don't know	
Age Range								
≤ 18	6	16	5	0.016 (sig)	7	7	13	0.043 (sig)
19 - 24	25	33	24		39	5	38	
25 - 30	38	19	13		38	8	24	
≥ 31	9	8	4		12	2	7	
Education Level								
Illiterate	1	2	3	0.103 (in)	1	1	4	0.165 (in)
Primary	34	32	16		37	10	33	
Secondary	15	14	11		19	4	17	
Higher Secondary	5	17	9		11	6	14	
Bachelor's Degree	16	8	7		22	1	8	
Bachelor's Degree or Higher	7	3	2		6	0	6	
Occupation								
Housewife	63	65	36	0.633 (in)	76	21	67	0.381 (in)
Student	7	8	6		10	1	10	
Job holder	6	2	4		7	0	5	
Business	2	1	0		3	0	0	

4.4.2 Factors Associated with Knowledge of PIH:

In the analysis of maternal age, education level, and occupation were found to a significant factors. Also after doing multivariable logistic regression analysis, we have found a significant relationship between maternal age, education level, occupation, and knowledge of Pregnancy Included Hypertension. As per responses of participants whose ages are (25-30) and more than 31 were more knowledgeable than other age groups pregnant women. Occupation also varies the factor, most housewives lack knowledge about the complications of having PIH. (Table: 4.4.2)

Table 4.4.3: Factors associated with knowledge about PIH

Variable	Heard about PIH			Knowledge of complications of PIH		
	Yes	No	P- value	Yes	No	P-Value
Age Range						
≤ 18	10	17	0.001 (sig)	1	26	0.001 (sig)
19 - 24	53	29		20	62	
25 - 30	63	7		36	34	
≥ 31	20	1		12	9	
Education Level						
Illiterate	5	1	0.132 (in)	3	3	0.323 (in)
Primary	57	13		26	54	
Secondary	27	13		11	29	
Higher Secondary	19	12		9	22	
Bachelor's Degree	27	4		13	18	
Bachelor's Degree or Higher	11	1		7	5	
Occupation						
Housewife	118	46	0.290 (in)	53	111	0.009 (sig)
Student	14	7		5	16	
Job holder	11	1		9	3	
Business	3	0		2	1	

4.5 Habituate of Food among Pregnant Women

The table illustrates the eating patterns of pregnant women during the data collecting period, a very small number 44(22%) of pregnant women responded they don't take extra salt with their meals but on the other hand, mostly 89 (44.5%) responders take extra salt very often. But as per the Bangladesh scenario the exactable ratio of people who have red meat occasionally is 99(49.5%) almost half of the responders, 70 (35%) responders responded they had red meat once or twice a month and 31 (15.5%) responders had weekly. Surprisingly, the maximum number of participants who intake vegetables twice a day is 128(64%) which is almost two-thirds people of the participants. 54 (27%) participants had once a day and 18 (9%) participants tried to have vegetables with every meal. 23(11.5%) out of 200 pregnant mothers responded they take tobacco daily, on the other hand also half of the responders 90(45%) shared they were not taking any kind of tobacco during pregnancy, but some of the pregnant mothers take tobacco often and occasionally which is 51(25.5%) and 35(18%).

Table 4.5.1: Food Habit

Variable		Frequency	Percentage
Extra Salt Level	Oftenly	89	44.5
	No	44	22
	Twice a day	40	20
	In Every meal	27	13.5
Red Meat Level	Occasionally	99	49.5
	Once or twice a month	70	35
	Weekly	31	15.5
Vegetable Level	Twice a day	128	64
	Once a day	54	27
	In Every meal	18	9
Tobacco Level	No	90	45
	Oftenly	51	25.5
	Occasionally	36	18
	Daily	23	11.5

CHAPTER FIVE

DISCUSSIONS

This study was conducted to identify the knowledge, awareness, and prevalence of PIH among pregnant women in certain areas of Dhaka, Bangladesh.

In a community-based study carried out by Mehta B, they found the history of previous gestational hypertension, LUCS (The lower uterine segment cesarean section), abortion, stillbirth, and preterm delivery is strongly related to risk of Pregnancy including hypertension (Bharti Mehta, 2015). The exact cause of PIH is still not clear in medical science, basic prevention depends on the identification of its risk factor, and increasing awareness and knowledge about pregnancy including hypertension. As per our study, pregnant mothers who have a family history (especially paternal) of high blood pressure and body mass index $>25 \text{ kg/m}^2$ were significantly associated with the risk of PIH.

By this study, we can see the respondents' hypertension during pregnancy is not closely linked to their family history of high blood pressure. Occupation, family members, family income, number of antenatal care, and gravida are not the main reasons for PIH. In our study, twenty-four percent of pregnant mother have high blood pressure during their pregnancy. And forty-nine point five percent of pregnant mothers are overweight or obese.

The World Health Organization (WHO) recommends that between 5% and 10% of deliveries occur via cesarean section. However, our research revealed a much higher rate of delivery with cesarean section by 31.00% (Muhammad Mahmudul Haque N. C., 2020). The World Health Organization states that rates of cesarean sections of 15% or more are considered to be more dangerous than usual. Based on an earlier study, there may be a correlation between higher rates of cesarean sections (15%) and increased morbidity and death for both mothers and Childs (Kathryn Chu, 2012).

According to this study, previous gestational hypertension, and a previous history of cesarean section may also affect new pregnancies for high blood pressure.

A similar study was conducted in Kerbala Iraq, where almost 81.7 percent of pregnant women had heard about PIH while another 18.3 percent of pregnant participants had not heard about PIH. Participants were acknowledged about PIH mainly by friends/relatives (63.5%), health care providers (25.3%), and others. As healthcare providers are not the main source of knowledge, for that reason they reported this can be a strong fact of their inadequate knowledge of PIH (Eman Abbood Al Ebrahimi, 2019).

But in this study, seventy-three percent of pregnant participants responded they had heard about PIH while twenty-seven percent of pregnant women did not heard about PIH. The main source of PIH knowledge by the participants was from healthcare promoters. But as long as participants were heard about PIH their knowledge of PIH is not strong. Almost seventy percent of pregnant women did not even know the complications of PIH. Same for awareness

they had heard about PIH but they did not take precautions seriously. Even fifty-eight percent of pregnant women were not aware of the treatment of PIH.

Our study shows that knowledge of complications of PIH in the age group of 25-30 was significantly higher as compared to other age groups. However, there is one more significant relationship between knowledge PIH and occupation. Our study finds housewives are lacking their knowledge of PIH.

In some studies, they reported no significant relationship between PIH and education status (Bharti Mehta, 2015). Our study also finds the same no significant relationship between educational statuses with Pregnancy including hypertension.

Respectively, there are significant factors associated with PIH awareness and maternal age.

CHAPTER SIX

CONCLUSION AND RECOMMENDATIONS

6.1. Conclusion

Although this study did not cover the whole nation, it accurately depicts the situation that Bangladeshi women face. Hypertension diseases in pregnancy in Dhaka, Bangladesh included early-age marriage status, low education level, housewife status, and personal and family history of hypertension. Lack of knowledge and awareness is one of the main causes of PIH-related maternal morbidity or mortality and neonatal death. Antenatal care clinics and community education campaigns about pregnancy including hypertension should be expanded by health care promoters, with a specific focus on awareness to lower age groups, pregnant women, women with less education, and housewives, Primi gravida.

6.2. Recommendations:

PIH is a curable illness, it is not properly managed and can result in severe maternal and neonatal issues in developing countries like Bangladesh government is working to prevent maternal morbidity or mortality and its complications. According to the results of our research, there are some recommendations for improving PIH in pregnant women:

- Encourage them to take antenatal care early in the first trimester of pregnancy.
- Well-being training projects and guidance booklets should be implemented all through the wards of the clinic/hospital to enhance pregnant women's understanding of PIH.
- Encourage them to eat more good quality healthy food, and avoid junk food and processed food.
- Authorities should promote education on PIH causes and prevention.
- Encourage ongoing education for paramedical staff through workshops, training programs, and conferences to improve nursing care for PIH; and ensure sufficient health facilities and staff for PIH management.

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APPENDIX I



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1. **Name:** Sadia Ali Rafa
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3. **Research title:** Prevalence and awareness of hypertensive disorders among pregnant women: A study at the Institute of Child and Mother Health (ICMH), Dhaka, Bangladesh.

4. Introduction:

Hypertensive disorders in pregnancy are one of the major causes of maternal and neonatal morbidity, mortality, premature birth, intrauterine growth retardation (IUGR), and low birth weight. In developing countries, maternal mortality constitutes 10-15% of maternal fatalities. (Muhammad Mahmudul Haque, 2020). According to the World Health Organization (WHO), about 3, 58,000 women die every year from pregnancy-related complications. Ninety-nine percent of maternal deaths are occurring in developing countries like Bangladesh. Nearly twelve percent of maternal deaths are linked with hypertensive disorders such as PIH during pregnancy. Centers for Disease Control and Prevention (CDC) recently reported hypertensive disorders accounted for 6.6% of deaths during pregnancy, 9.3% of deaths within 42 days of pregnancy, and 5.4% of fatalities happening between 42 days and 1 year. (Fatama T. Zohora, 2022)

Hypertension, the most prevalent incidentally diagnosed chronic condition, is a key risk factor for cerebrovascular accidents as well as coronary heart disease, accounting for two-thirds of all cerebrovascular accidents. Together with other cardiovascular diseases, public health issues are closely linked to urbanization, aging populations, and westernized socio-economic sedentary lifestyles that encourage excessive salt and alcohol consumption, smoking, obesity as well as lack of physical activity. (Pugie Tawanda Chimberengwa, 2019) Lack of education and a lack of sufficient antenatal care and nutrition have caused births more likely to suffer the symptoms of hypertensive disorders. Bangladesh, a country with a high population density, also has an unusually high rate of maternal death owing to preventable causes. In Bangladesh, maternal mortality is a major public health concern. (Rahman, 2021)

Operational definition

Hypertension in pregnancy was defined as the SBP and DBP were on or above systolic and diastolic 140 mmHg and 90 mmHg respectively. (Fatama T. Zohora, 2022)

Classification of hypertension in pregnancy:

- **Preeclampsia**

Systolic blood pressure ≥ 140 mm Hg or diastolic blood pressure ≥ 90 mm Hg occurring ≥ 20 weeks' gestation in a previously normotensive woman.

Proteinuria ≥ 300 mg in a 24-hour urine collection.

- **Gestational hypertension**

Systolic blood pressure ≥ 140 mm Hg or diastolic blood pressure ≥ 90 mm Hg ≥ 20 weeks' gestation in a previously normotensive woman, but without proteinuria.

- **Chronic hypertension**

Systolic blood pressure ≥ 140 mmHg or diastolic blood pressure ≥ 90 mmHg that is documented < 20 th week of gestation.

- **Preeclampsia superimposed on chronic hypertension**

New-onset or greatly increased proteinuria.

Sudden exacerbation of hypertension or other signs of multisystem involvement such as thrombocytopenia or transaminitis in a woman with prior hypertension. (Caren G. Solomon, 2006)

5. Objective

The worldwide incidence of hypertension diseases during pregnancy continues to increase and is related to maternal mortality.

- Estimation of the prevalence of hypertension in pregnancy.
- Assessment of awareness regarding PIH.
- Observations of food habits.
- Association of the Knowledge of hypertension in Pregnancy with socio-demographic status

- 6. Problem Statement and Justification:** Hypertension diseases in pregnancy in Dhaka, Bangladesh included early-age marriage status, low education level, housewife status, and personal and family history of hypertension. Lack of knowledge and awareness is one of the main causes of PIH-related maternal morbidity or mortality and neonatal death. This assessment may promote awareness and health, changing their lifestyle.

7. Method: Data will be collected by interviewing the patient and will review the record. Firstly make them understand why we are doing this study. The interviewer filled up the questionnaire during the interview. Personal information, Health status of pregnant mothers, Obstetrical history, Knowledge about PIH, awareness about PIH, and also Habituate of food consumptions.

8. Methodology:

8.1 Study design: It was a descriptive type of cross-sectional study to estimate the prevalence and knowledge of hypertension disorders among pregnant women.

8.2 Study site: Institute of Child and Mother Health (ICMH), Dhaka, Bangladesh

8.3 Study Population: All the pregnant women registered at the particular hospital at a point in time. The written consent will be taken before the interview from the study population.

8.4 Study period: The study was conducted between December 2023 to January 2024

8.5 Data analysis: Collected data were entered in the Google Sheet and analysis was carried out using Statistical Package for Social Sciences (SPSS).

8.6 Sample size calculation and sampling procedures: The sample size for the study's female participants was determined using the formula for estimating sample size for a single proportion as follows:

$$n = z^2/d^2 \times pq$$

Where z = risk of Type I error; d = absolute precision; p = expected prevalence; $q = 1 - p$ (Monica Muti, 2015)

8.7 Ethical Consideration: Secure ethical approval from the University's review board and guarantee the privacy and consent of participants. All patients willing to participate in the study will be informed that there is no extra risk during history taking, physical examination, and investigations.

9. Expected Outcome: The importance of maintaining blood pressure during Pregnancy will be understood. Knowledge and awareness may improve. Certainly using this study as a foundation for future research in the field is a promising way to enhance our understanding.

10. Time Schedule of Activities in the Proposed Study:

	Activities by months (Start to end)					
	1	2	3	4	5	6
Literature research						
Synopsis development						
Study Protocol and Questionnaire development						
Ethical Approval						
Pretesting of study protocols, Questionnaire						
Data and sample collection phase						
Data analysis and report writing						
Report submission						

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APPENDIX II

Prevalence and awareness of hypertensive disorders among the pregnant women: A study at Institute of Child and Mother Health (ICMH), Dhaka, Bangladesh

Questionnaire

Name:

Code ID:

A. Personal Information of patients:

I. What is your Age:

II. What is your Education qualification:

a. Illiterate b. Primary c. Secondary d. Higher e. Graduation/Above

III. What is your Occupation:

a. Homemaker b. Job holder c. Business d. Agriculture e. Others

IV. Your Husband's Education qualification:

a. Illiterate b. Primary c. Secondary d. Higher e. Graduation/Above

V. What is your Occupation:

a. Unemployed b. Job holder c. Business d. Agriculture e. Others

VI. What is your Religion:

a. Islam b. Hindu c. Christian d. others

VII. What is your socioeconomic status :

a. High b. Middle c. Low

VIII. Number of your family members:

IX. Where is your place of residence:

B. Health status of pregnant mothers

- I. Height:**
- II. Weight:**
- III. BMI:**
- IV. Systolic Blood Pressure:**
- V. Diastolic Blood Pressure:**
- VI. Anemia**
- VII. Diabetes**
- VIII. Cardiac disease**
- IX. Kidney disease**
- X. Others**

C. Obstetrical history

- I. Gravida :**
 - a. Primi
 - b. Gravida-2
 - c. Gravida-3 and above
- II. No. of antenatal care:**
 - a. <3
 - b. 3 or more
- III. Do you have any history of previous cesarean section**
 - a. Yes
 - b. No
- IV. Do you have any history of previous preterm delivery**
 - a. Yes
 - b. No
- V. Do you have any history of hypertension in previous pregnancy**
 - a. Yes
 - b. No
- VI. Do you have any history of paternal hypertension**
 - a. Yes
 - b. No
- VII. Do you have any history of maternal hypertension**
 - a. Yes
 - b. No
- VIII. Do you have any history of abortion**
 - a. Yes
 - b. No
- IX. Do you have any history of still birth**
 - a. Yes
 - b. No
- X. Do you have any history in your family**
 - a. Yes
 - b. No
- XI. What is your Period of gestation?**
 - a. ≤ 20 weeks
 - b. > 20 weeks

D. Knowledge about Pregnancy Included Hypertension (PIH)

I. Do you Ever heard about PIH

- a. Yes b. No

II. If the answer is yes then from where did she get to know?

- a. Internet b. Relative and friend c. Health care promoters' d. Others

III. What do you think, when can PIH starts?

- a. Before pregnancy b. After 20 weeks of pregnancy
c. Before and during pregnancy d. Do not know

IV. Do you know any sign and symptoms of PIH?

- a. Yes b. No

V. Do you have any knowledge about the complications of PIH?

- a. Yes b. No

VI. What do you think, PIH can be prevented?

- a. Yes b. No c. Don't know

VII. Do you know any management of PIH?

- a. Yes b. No c. Don't know

VIII. Do you have any knowledge about PIH treatment?

- a. Yes b. No

IX. Do you have any knowledge about side effect of PIH drugs?

- a. Yes b. No

X. What do you think, Regular exercise can prevent PIH?

- a. Yes b. No c. Don't know

XI. What do you think, losing excess body weight before conception can prevent PIH?

- a. Yes b. No c. Don't know

E. Food Habituation

I. Do you take extra salt with any meal?

- a. Oftenly b. Twice a day c. In every meal d. No

II. Do you consume Red meat?

- a. Weekly b. Once or twice a month c. Occasionally

III. Do you prefer to have vegetable?

- a. In every meal b. Once a day c. Twice a day

IV. Do you prefer to have tobacco (PAN/JARDA)?

- a. Daily b. Oftenly c. Occasionally d. No

APPENDIX III

Sadia Ali Rafa 201-34-1064 Project report

ORIGINALITY REPORT

16%	13%	8%	3%
SIMILARITY INDEX	INTERNET SOURCES	PUBLICATIONS	STUDENT PAPERS

PRIMARY SOURCES

1	www.iosrjournals.org Internet Source	2%
2	saudijournals.com Internet Source	1%
3	listens.online Internet Source	1%
4	Leon C Chesley. "Hypertension in pregnancy: Definitions, familial factor, and remote prognosis" Kidney International 08/1980	1%