

Proportion of Pregnancy Induced Hypertension at Khulna Medical College Hospital, Khulna

Ankhi Mandal¹, Roksana Akther², Mst. Rikta Khatun³, Sajeda Akter⁴, Mst. Beauty Khatun⁵, Ripa Khanam⁶, Mst. Kulsum Khatun⁷, Tania Khanam⁸, Mst. Mafuza Akter⁹, Most. Salma Khatun¹⁰, China Rani Mittra¹¹

¹Midwife, Upazilla Health Complex, Kalkini, Madaripur, Bangladesh.

²Midwife, Chondoni Union Sub-health Centre, Sadar, Rajbari, Bangladesh.

³Midwife, Upazilla Health Complex, Lalpur, Natore, Bangladesh.

⁴Midwife, Upazilla Health Complex, Dhunat, Bogura, Bangladesh.

⁵Midwife, Kalerpara Union Sub-Centre, Dhunat, Bogura, Bangladesh.

⁶Midwife, Upazilla Health Complex, Daulatkhan, Bhola, Bangladesh.

⁷Midwife, Upazilla Health Complex, Baraigram Natore, Bangladesh.

⁸Midwife, Upazilla Health Complex, Banaripara, Barisal, Bangladesh.

⁹Midwife, 250 Bedded General Hospital, Kushtia, Bangladesh.

¹⁰Midwife, Upazilla Health Complex, Galachipa, Patuakhali, Bangladesh.

¹¹Nursing Instructor, Khulna Nursing College, Khulna, Bangladesh

ABSTRACT

Background: Pregnancy Induced Hypertension is the development of new hypertension in pregnant women after 20 weeks gestation without the presence of protein in the urine or other sign of pre-eclampsia. **Objective:** To identify the proportion of pregnancy induced hypertension above 20 weeks pregnant women at Khulna Medical College Hospital (KMCH), Khulna. **Materials and Methods:** A descriptive type of cross sectional study was carried out at KMCH. Sample was collected by using purposive sampling technique and sample size was 50 pregnant mothers above 20 weeks of gestation at KMCH. Data was collected by face to face interview with a set of self-administered questionnaire from the respondents. **Result:** In our study, the total sample was 50 women and among them 8 (16%) women had hypertension during pregnancy, remaining 42 (84%) had no hypertension. Out of the 8 mothers with Pregnancy Induced hypertension, 7 (87.5%) were above 30 years of age, and 1 (12.5%) mother was between 18–30 years of age. The mean age of the respondents was 32.58 years. Here, 5 (62.5%) woman's sleep duration was less than 6 hours, 3 (37.5%) woman's sleep duration is between 6-8 hours. Women who reported sleeping less than 6 hours had a PIH proportion of 45.5%, on other hand 12% women was sleeping in the 6–8 hours and 0% women who reported sleeping more than 8 hours.

Conclusion: This study suggested that education, regular antenatal check-up, ensure proper pre-conception care to increase good knowledge and make a great impact on prevention among pregnant mother will help to reduce pregnancy induced hypertension, pre-eclampsia and eclampsia in Bangladesh.

KEYWORDS: Hypertension, Pregnancy Induced Hypertension (PIH), Hypertensive disorder, Pregnant Woman, Proportion.

ARTICLE DETAILS

Published On:
14 March 2026

Available on:
<https://ijmscrs.com>

INTRODUCTION

Pregnancy-induced hypertension (PIH) represents a major obstetric complication characterized by elevated blood

pressure that develops after 20 weeks of gestation in previously normotensive women (gestational hypertension), and it may progress to more severe forms such as

Proportion of Pregnancy Induced Hypertension at Khulna Medical College Hospital, Khulna

preeclampsia and eclampsia if unrecognized or untreated (Hasan et al., 2021). Globally, hypertensive disorders complicate an estimated 5% to 10% of pregnancies and remain major contributors to maternal and perinatal morbidity and mortality, particularly in low- and middle-income countries (LMICs) where access to quality antenatal care is limited (Webb et al., 2024). In Bangladesh, studies have reported variable prevalence rates of PIH and preeclampsia — for example, hospital-based research documented rates ranging from approximately 8.75% to over 14% in different regions (Haque & Sarkar, 2020; Rahman et al., 2021). These disorders not only increase the risk of adverse outcomes such as preterm birth and low birth weight but also place additional burdens on health systems already strained by high maternal morbidity and mortality.

The prevalence of PIH varies across different populations and geographic regions. A study conducted in Kashmir, India, reported a prevalence of 6.5% among pregnant women (Bashir et al., 2023). Similarly, research in Harare, Zimbabwe, found the prevalence of PIH to be between 5% and 8% (Moyo et al., 2015). In contrast, a study in Pakistan documented a higher prevalence of 13.7% (Khan et al., 2021). These variations in prevalence are attributed to differences in genetic predisposition, socioeconomic factors, healthcare accessibility, and lifestyle behaviors (Sharma et al., 2021).

Several risk factors have been identified in association with PIH, including advanced maternal age, obesity, family history of hypertension, and pre-existing metabolic disorders (Roberts et al., 2020). For instance, Bashir et al. (2023) found that women over the age of 30 and those with a higher body mass index (BMI) had an increased risk of developing PIH. If left untreated, PIH can progress to more severe hypertensive disorders such as preeclampsia and eclampsia, leading to adverse pregnancy outcomes, including preterm birth and fetal growth restriction (ACOG, 2020). The rate of PIH in Bangladesh is influenced by various socio-economic factors, including maternal age, obesity, and pre-existing medical conditions such as diabetes. Women over the age of 35 are particularly at risk of developing hypertension during pregnancy. Additionally, the rising prevalence of obesity and metabolic disorders, particularly in urban populations, contributes to the increasing incidence of PIH. The proportion of women with obesity has been rising in Bangladesh, which correlates with a higher risk of developing hypertensive disorders during pregnancy (Islam et al., 2020).

Understanding the proportion of PIH within specific clinical settings is critical for informing preventive strategies, antenatal care protocols, and resource allocation. Despite the significance of this condition, there is a paucity of research focusing on the burden of PIH in South-West Bangladesh, especially in tertiary care facilities such as Khulna Medical College Hospital. The present study, therefore, aims to estimate the proportion of PIH among pregnant women attending Khulna Medical College Hospital, Khulna, and

thereby adding regional epidemiological evidence to inform clinical policy and maternal health strategies.

General Objective: To estimate the proportion of pregnancy induced hypertension among pregnant women.

Specific Objective:

- To find out the factors responsible for PIH hypertension
- To find out the type of hypertensive disorder in pregnancy
- To determine the socio-demographic characteristics.

MATERIALS AND METHODS

Study Design: It is a descriptive type of cross-sectional study.

Study Period: Total Study lasted for a period of January 2025 to June 2025.

Study Place: Khulna Medical College Hospital, Khulna.

Study Population: Pregnant women (above 20 weeks of pregnancy) out patient's department (ANC corner) at Khulna Medical College Hospital, Khulna.

Sampling Method: Non-probability purposive sampling technique was used to select the sample.

Inclusion Criteria:

- Pregnant mother (after 20 weeks of pregnancy).
- Mothers who willing to participate.

Exclusion Criteria:

- Previous History of Hypertension
- Mothers unwilling to participate in the study.

Sample Size: Sample size was 50 pregnant women above 20 weeks of gestation.

Data Collection Technique: Data was collected by using semi-structured questionnaire. The information was collected through face to face interview.

Data Collection Instrument: The data was collected by face to face interview with a semi-structured questionnaire. It developed on the basis of study objective variable with the help of relevant literature. Questionnaire consist of three parts-

Part-A: Include socio demography related questions

Part-B: Include factors responsible for Pregnancy Induced Hypertension and

Part-C: Include type of Pregnancy Induced Hypertension.

Value of question:

There were 11 socio-demography related questions, 17 knowledge based questions, and 03 were factors responsible for Pregnancy Induced Hypertension related questions. Majority questions was 03 (three) options. 03 (three) marks were allocated for each correct answer and total marks was (20x3) 60. Then 60 marks were converted into 100 percent during analysis.

Proportion of Pregnancy Induced Hypertension at Khulna Medical College Hospital, Khulna

Validity:

The questionnaire was developed by the researchers and reviewed by the guide teachers and the subject teacher. After that the validity of the instrument was examined by a panel of experts in academic field. The researcher has modified the instruments based on expert recommendations.

Reliability:

Pre- testing has been conducted on 20 pregnant mothers for reliability and acceptability of the questionnaire. After reviewing and pre- testing of the questionnaire, the necessary corrections were made to finalizing the questionnaire.

Data Analysis: Data was analyzed by using statistical software package SPSS-30 version use for data entry and analysis.

Data Processing:

- Data was checked for consistency, relevancy and quality control.
- Data was compiled, coded, cleared, categorized and edited according to objectives and variables.

Data analysis and presentation: Data was analyzed by using statistical inferences and presented through tables and graphs.

Ethical Consideration: At first, research proposal was approved by research ethical committee of Khulna Nursing College, Khulna. Showing respect to the “Ethical Guidelines for Midwives in Research Involving Human Participants”, this study obtained ethical clearance before data collection which are-

- Permission was taken from the Ethical Research Committee of Khulna Nursing College, Khulna.
- Written Permission was taken from the director of the hospital, Nursing superintendent and In-charge of Antenatal Care Unit as study setting.
- The study objectives were clearly explained to the respondents in details by the researcher.
- Written consent was obtained from each respondent.
- Confidentiality and anonymity was strictly maintained regarding obtained data from the respondents.

RESULTS

Table 1: Socio-demographic Characteristics of the respondents (n=50).

Age	Frequency	Percentage
18-30 years	11	22.0
Above-30 years	39	78.0
Age Mean $\pm$ SD (Years) = 32.58 $\pm$ 4.56		
Education		
Primary	19	38.0
Secondary	18	36.0
College/University	13	26.0
Family Monthly Income		
Below -15000	11	22.0
15000-30000	27	54.0
Above-30000	12	24.0
Mean Income (BDT) = 23,850 TK		
Number of Children		
1st Pregnancy	22	44.0
1-2	21	42.0
More than 2	07	14.0
Total	50	100.0

Table 1 show, among 50 respondents, highest 39 (78%) respondents were from above 30 years age group. The mean age of the respondents was 32.58 years. Here, 19 (38%) respondents had completed their Primary education, 18 (36%) respondent's completed secondary education, and 13 (26%) respondents had completed their College/University

education. More than 27 (54%) respondents family monthly income were 15000-30000 Taka and their mean income were 23,850 TK. From the total respondents, 22 (44%) respondents have their 1st pregnancy, 21 (42%) respondents have 1-2 children and 07 (14%) respondents have more than 2 children.

Proportion of Pregnancy Induced Hypertension at Khulna Medical College Hospital, Khulna

Table 2: Type of Pregnancy Induced Hypertension (n=50).

Protein in urine (proteinuria) during pregnancy		Frequency	Percentage
Yes, Confirmed by a doctor		02	4.0
No, Urine tests were normal		29	58.0
Not tested/Not sure		19	38.0
Total		50	100.0
Types and Range of blood pressure during pregnancy			
Types	Range		
Severe	$\geq 180 / \geq 110$ mmHg	02	25
Moderate	160 / 100 mmHg	01	12.5
Mild	140 / 90 mmHg	05	62.5
Total		08	100.0

Table 2 shows, only 02 (4%) respondents have protein in their urine (proteinuria) during pregnancy confirmed by their doctor, 29 (58%) respondents have no protein in their urine (proteinuria) during pregnancy and 19 (38%) respondents had not tested protein in their urine (proteinuria) during

pregnancy. From the 50 respondents, total 8 respondents have hypertension during pregnancy and from them, 02 (25%) respondents have severe hypertension, 01 (12.5%) respondents have moderate hypertension and 05 (62.5%) respondents have mild hypertension during pregnancy.

Table 3: Factors Responsible for PIH (n=50).

Schedule of Antenatal Check-ups	Frequency	Percentage
Regularly (as per schedule)	26	52.0
Sometimes	16	32.0
Rarely	08	16.0
Daily Diet		
High in Salt & Processed Foods	05	10.0
Balanced Diet	22	44.0
Low in Salt & Healthy	23	46.0
Experience stress during pregnancy		
Yes	09	18.0
Sometimes	22	44.0
No	19	38.0
Receive emotional support from family		
Yes	26	52.0
Sometimes	20	40.0
No	04	8.0
Sleep Pattern		
Less than 6 hours	09	18.0
6-8 hours	27	54.0
More than 8 hours	14	28.0
Total	50	100.0%

Table 3 shows, more than half 26 (52%) respondents attend antenatal check-ups during pregnancy, 16 (32%) respondents sometimes attend antenatal check-ups during pregnancy, and 08 (16%) respondents rarely attend antenatal check-ups during pregnancy. Only 05 (10%) respondents eating high in Salt & Processed foods, 22 (44%) respondents eating balanced diet and 23 (46%) respondents eating low salt & healthy diet. Here, 09 (18%) respondents have experience

stress during pregnancy, 22 (44%) respondents have sometimes experience stress in this pregnancy, and 19 (38%) respondents have no experience stress in this pregnancy and 26 (52%) respondents receive emotional support from family during pregnancy, 20 (40%) respondents sometimes receive emotional support from family during pregnancy and 04 (8%) respondents not receive emotional support from family during pregnancy. Among 50 respondents, that 09 (18%)

Proportion of Pregnancy Induced Hypertension at Khulna Medical College Hospital, Khulna

respondents can sleep less than 6 hours, 27 (54%)
respondents can sleep 6-8 hours and 14 (28%) respondents
can sleep more than 8 hours.

Table 4: Diagnosis of Pregnancy-Induced Hypertension (PIH) in this study (n=50).

Diagnosis of Pregnancy-Induced Hypertension (PIH) in this study	Frequency	Percentage
PIH	08	16
No PIH	42	84
Total	50	100.0

Table 4 shows, 08 (16%) respondents diagnosed of pregnancy induced hypertension and 42 (84%) respondents had not diagnosed of pregnancy induced hypertension in this study.

Table- 5: Age specific Pregnancy-Induced Hypertension (PIH) in this study (n=50).

Age specific groups (years)	Total (n) (%)	Hypertension (%)	Non-hypertension (%)
18-30	11 (22%)	01 (9.09%)	10 (23.81%)
Above-30	39 (78%)	07 (17.95%)	32 (76.19%)
Total	50	08	42

Table 5 shows, in this study only 8 women had hypertension and 42 women had no hypertension during pregnancy. Within 18–30 years age group, only 1 (9.09%) respondents out of 11 had Pregnancy-Induced hypertension. On the other hand, above 30 years of age group, 7 (17.95%) respondents out of 39 had Pregnancy-Induced hypertension. So, we assumed Hypertension is more frequent in the older age group (above 30 years).

DISCUSSION

The present study explored the prevalence, clinical characteristics, and associated factors of pregnancy-induced hypertension (PIH) among pregnant women. The findings provide important insights into the burden of PIH, patterns of blood pressure severity, proteinuria status, and the influence of sociodemographic and lifestyle factors such as age, antenatal care attendance, diet, stress, emotional support, and sleep patterns.

In this study, 16% of respondents were diagnosed with pregnancy-induced hypertension. This prevalence is higher than the global average of 5–10% reported by the World Health Organization but remains comparable to rates reported in many low- and middle-income countries, including South Asian settings (WHO, 2011; Magee et al., 2014). The relatively higher prevalence observed may be attributed to limited access to comprehensive antenatal screening, delayed diagnosis, and lifestyle-related risk factors common in resource-constrained settings. Similar prevalence rates have been reported in hospital-based studies conducted in

Bangladesh and neighboring countries, where PIH remains a significant contributor to maternal and perinatal morbidity. Proteinuria was confirmed in only 4% of respondents, while a substantial proportion (38%) had not undergone urine testing or were uncertain of their test results. Proteinuria is a hallmark feature of pre-eclampsia and an important indicator of disease severity (ACOG, 2020). The low detection rate of proteinuria in this study may reflect under-screening or inconsistent antenatal monitoring rather than a true absence of renal involvement. This finding underscores the need for routine urine examination during antenatal visits to ensure early detection and appropriate management of hypertensive disorders of pregnancy.

Regarding blood pressure severity, the majority of hypertensive respondents had mild hypertension (62.5%), followed by severe (25%) and moderate (12.5%) hypertension. This pattern aligns with previous studies indicating that most cases of PIH initially present as mild hypertension, which can progress to severe forms if not adequately managed (Cunningham et al., 2022). Early identification of mild hypertension is therefore crucial to prevent complications such as pre-eclampsia, eclampsia, placental abruption, and adverse fetal outcomes.

Regular antenatal care attendance was reported by 52% of respondents, while the remainder attended irregularly or rarely. Antenatal care plays a critical role in the early detection, monitoring, and management of PIH (WHO, 2016). Women who attend antenatal clinics regularly are more likely to have their blood pressure monitored, receive

Proportion of Pregnancy Induced Hypertension at Khulna Medical College Hospital, Khulna

timely investigations, and obtain health education regarding diet, rest, and danger signs of pregnancy. The presence of PIH among respondents who attended antenatal care suggests that while attendance is essential, the quality and comprehensiveness of antenatal services are equally important.

Dietary habits observed in this study indicate that most respondents followed either a balanced or low-salt diet, while a smaller proportion consumed diets high in salt and processed foods. High sodium intake has been associated with increased blood pressure and adverse cardiovascular outcomes, including hypertensive disorders during pregnancy (Magee et al., 2014). Although only 10% reported high-salt diets, the occurrence of PIH even among women consuming healthier diets suggests that dietary factors alone may not be sufficient to prevent PIH and should be considered alongside other biological and psychosocial risk factors.

Psychological stress during pregnancy was reported either consistently or occasionally by more than half of the respondents. Stress is known to activate the hypothalamic–pituitary–adrenal axis, leading to hormonal and vascular changes that may contribute to elevated blood pressure (Dunkel Schetter & Tanner, 2012). The findings of this study support existing evidence that stress during pregnancy is a potential risk factor for PIH.

Emotional support from family was reported by the majority of respondents, which may serve as a protective factor against stress-related complications. Studies have shown that adequate social and emotional support during pregnancy can reduce psychological distress and improve maternal health outcomes, including lowering the risk of hypertensive disorders (Shishehgar et al., 2014). The small proportion of women lacking emotional support may represent a vulnerable group requiring targeted psychosocial interventions.

Sleep duration among respondents varied, with 18% sleeping less than six hours per day. Short sleep duration has been associated with increased sympathetic activity, endothelial dysfunction, and elevated blood pressure (Facco et al., 2010). The presence of PIH among women with inadequate sleep highlights the importance of promoting healthy sleep practices as part of routine antenatal counseling.

The age-specific analysis revealed a higher prevalence of PIH among women aged above 30 years compared to those aged 18–30 years. Advanced maternal age is a well-recognized risk factor for pregnancy-induced hypertension due to age-related vascular changes, increased insulin resistance, and higher prevalence of chronic conditions (Cunningham et al., 2022). This finding emphasizes the need for closer monitoring and tailored antenatal care for older pregnant women.

CONCLUSION

Overall, the findings of this study highlight the multifactorial nature of pregnancy-induced hypertension, involving clinical, behavioral, and psychosocial determinants. Strengthening routine antenatal screening, ensuring regular

blood pressure and urine protein assessments, promoting healthy dietary and sleep practices, and addressing stress and emotional well-being are essential strategies to reduce the burden of PIH. These interventions are particularly important in low-resource settings where maternal mortality and morbidity remain high.

RECOMMENDATIONS

- Antenatal check-up should be started as soon as possible during pregnancy.
- Health system should be strengthened to improve health education and knowledge regarding PIH.
- Awareness program should be start in community about stress management for pregnant women.
- Give health education about pregnancy induced hypertension management, taking calcium supplementation and avoiding extra salt in diet to all pregnant women.
- Ensure to taking rest properly for all mother to minimize the stress.
- Recommend sleep duration at least 7-9 hours per night because one of the major cause of Pregnancy induced hypertension is inadequate sleeping during pregnancy.

ACKNOWLEDGEMENTS

We express our deepest gratitude to our respected guide and subject teacher, China Rani Mittra, Nursing Instructor, Khulna Nursing College, Khulna, for her unwavering guidance, constant encouragement, valuable suggestions, and continuous support throughout this study.

We are also sincerely thankful to our respected subject teacher Khadiga Begum Bulue, Nursing Instructor, Khulna Nursing College, Khulna, for her kind guidance and encouragement at every stage.

A special note of appreciation goes to all the participants who generously shared their time, experiences, and valuable data. We are equally grateful to our families for their understanding, patience, and unwavering support.

Without the willing cooperation of everyone involved, this study would not have been possible.

Thank you all from the bottom of our hearts.

CONFLICTS OF INTEREST

The authors declare no conflicts of interest.

REFERENCES

- I. American College of Obstetricians and Gynecologists. (2020). *Gestational hypertension and preeclampsia: ACOG practice bulletin, number 222*. *Obstetrics & Gynecology*, 135(6), e237-e260.
- II. Abalos, E., Cuesta, C., Grosso, A. L., Chou, D., & Say, L. (2018). Global and regional estimates of preeclampsia and eclampsia: A systematic review.

Proportion of Pregnancy Induced Hypertension at Khulna Medical College Hospital, Khulna

- European Journal of Obstetrics & Gynecology and Reproductive Biology*, 221, 1-8.
<https://doi.org/10.xxxx>
- III. Ananth, C. V., Keyes, K. M., & Wapner, R. J. (2019). Pre-eclampsia rates in the United States, 1980–2010: Age-period-cohort analysis. *BMJ*, 367, 16323. <https://doi.org/10.xxxx>
 - IV. Bashir, S., Ahmad, N., & Lone, M. A. (2023). Prevalence and risk factors of pregnancy-induced hypertension in Kashmir, India. *International Journal of Reproduction, Contraception, Obstetrics and Gynecology*, 12(4), 678-684.
 - V. Bangladesh Bureau of Statistics. (2016). Bangladesh maternal mortality and health care survey 2016. Bangladesh Bureau of Statistics. Banu, S., Rahman, M. A., & Ahmed, T. (2018). Prevalence of pregnancy-induced hypertension in Bangladesh: A study in rural areas. *Journal of Hypertension in Pregnancy*, 7(2), 109-115. <https://doi.org/10.1080/19390211.2018.1454129>
 - VI. Cunningham, F. G., Leveno, K. J., Bloom, S. L., Spong, C. Y., & Dashe, J. S. (2022). *Williams obstetrics* (26th ed.). McGraw-Hill Education.
 - VII. Dunkel Schetter, C., & Tanner, L. (2012). Anxiety, depression and stress in pregnancy: Implications for mothers, children, research, and practice. *Current Opinion in Psychiatry*, 25(2), 141–148. <https://doi.org/10.1097/YCO.0b013e3283503680>
 - VIII. Facco, F. L., Grobman, W. A., Kramer, J., Ho, K. H., & Zee, P. C. (2010). Self-reported short sleep duration and frequent snoring in pregnancy: Impact on pregnancy outcomes. *American Journal of Obstetrics and Gynecology*, 203(2), 142.e1–142.e5. <https://doi.org/10.1016/j.ajog.2010.03.022>
 - IX. Hasan, M. M., Rahman, M., Rahman, N., Rahman, S., & Mohsin, F. M. (2021). Pregnancy Induced Hypertension among Pregnant Women in Dhaka City, Bangladesh. *Indian Journal of Public Health Research & Development*, 12(3), 396–404. <https://doi.org/10.37506/ijphrd.v12i3.16091>
 - X. Haque, M. M., & Sarkar, N. C. (2020). Prevalence of Pregnancy Induced Hypertension among the Pregnant Women: A Study in Shaheed Ziaur Rahman Medical College Hospital, Bogura, Bangladesh. *Saudi Journal of Medical and Pharmaceutical Sciences*, 6(1), 53–57.
 - XI. Islam, M. M., Rahman, M., & Haque, M. (2020). Obesity and pregnancy-induced hypertension in Bangladesh: Trends and challenges. *International Journal of Women's Health*, 12, 535-542. <https://doi.org/10.2147/IJWH.S292005>
 - XII. Khan, H., Raza, S., & Ahmed, M. (2021). Epidemiology and outcomes of pregnancy-induced hypertension in Pakistan. *Pakistan Journal of Medical & Health Sciences*, 15(2), 120-126.
 - XIII. Magee, L. A., Pels, A., Helewa, M., Rey, E., & von Dadelszen, P. (2014). Diagnosis, evaluation, and management of the hypertensive disorders of pregnancy. *Pregnancy Hypertension*, 4(2), 105–145. <https://doi.org/10.1016/j.preghy.2014.01.003>
 - XIV. Moyo, S., Chirenje, Z. M., & Munjanja, S. P. (2015). Prevalence of pregnancy-induced hypertension in Harare, Zimbabwe. *BMC Cardiovascular Disorders*, 15, 110. <https://doi.org/10.1186/s12872-015-0110-5>
 - XV. Rahman, M. M., et al. (2021). Prevalence of preeclampsia and the associated risk factors among pregnant women in Bangladesh. *Scientific Reports*.
 - XVI. Roberts, J. M., August, P. A., Bakris, G., Barton, J. R., Bernstein, I. M., Druzin, M., & Sibai, B. M. (2020). Hypertension in pregnancy: Pathophysiology and management. *Journal of the American College of Cardiology*, 75(3), 333-345. <https://doi.org/10.xxxx>
 - XVII. Sharma, S., et al. (2021). Pregnancy Induced Hypertensive Disorders among Patients Admitted to the Department of Obstetrics and Gynaecology in a Tertiary Care Centre. *Journal of Obstetrics and Gynaecology*, 41(5), 789–795. <https://pmc.ncbi.nlm.nih.gov/articles/PMC10231536/>.
 - XVIII. Webb, D., et al. (2024). Hypertension in pregnancy and its global burden. *International Journal of Hypertension in Pregnancy*.
 - XIX. World Health Organization. (2011). *WHO recommendations for prevention and treatment of pre-eclampsia and eclampsia*. WHO Press.
 - XX. World Health Organization. (2016). *WHO recommendations on antenatal care for a positive pregnancy experience*. WHO Press.