

Factors Infuencing The Incidence of Preeclampsia in Labour

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Article Info	Abstract
Article History Submitted, 2025-11-02 Accepted, 2025-11-30 Published, 2025-12-31	Severe preeclampsia (PEB) is one of the most serious pregnancy complications and remains a leading cause of maternal and foetal morbidity and mortality worldwide. According to the World Health Organization, 10–15% of maternal deaths in developing countries are caused by hypertensive disorders in pregnancy, including preeclampsia and eclampsia. In Indonesia, data from the Ministry of Health show that preeclampsia is the second leading cause of maternal death after haemorrhage, contributing to 24% of cases. This condition not only endangers maternal health but also has detrimental effects on the foetus, such as low birth weight (LBW), prematurity, and neonatal asphyxia. Therefore, understanding the factors that influence the incidence of severe preeclampsia is essential for prevention and early management efforts. The purpose of this study is to identify and analyse the factors associated with the incidence of severe preeclampsia during labour based on research conducted in Indonesia, serving as a foundation for the development of promotive and preventive strategies in midwifery care. This study employs a literature review method with a systematic approach. Data sources were obtained from the Google Scholar database using the keywords “factors,” “preeclampsia,” and “labour.” Inclusion criteria consisted of Indonesian-language research articles, categorized as research articles, and focusing on factors influencing the incidence of preeclampsia. A total of 18 articles that met the inclusion criteria were analysed using a descriptive-thematic approach to identify patterns and interrelationships among variables. The findings indicate that the factors associated with severe preeclampsia include maternal age (<20 years or >35 years), gestational age (>34 weeks), parity, history of abortion, history of hypertension or preeclampsia, and body mass index. External factors include anxiety, educational level, knowledge, and delays in antenatal care (ANC) services. Severe preeclampsia was also found to be significantly associated with obstetric complications such as preterm labour, low birth weight, neonatal asphyxia, and an increased rate of caesarean section.
Keywords: Severe preeclampsia, morbidity, mortality, labor, obstetric complication	

Introduction

Severe preeclampsia (PEB) remains a major contributor to maternal and neonatal morbidity and mortality worldwide. The World Health Organization (2023) reports that approximately 10–15% of maternal deaths in developing nations are caused by hypertensive disorders of pregnancy, including preeclampsia and eclampsia. In Indonesia, the Ministry of

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Health (2022) identified preeclampsia as the second leading cause of maternal death after haemorrhage, accounting for 24% of cases.

Severe preeclampsia is characterized by elevated blood pressure ($\geq 160/110$ mmHg) accompanied by proteinuria ($\geq 2+$), and may result in multi-organ dysfunction affecting the kidneys, liver, or central nervous system (Prawirohardjo, 2020). This condition typically develops after 20 weeks of gestation and, if untreated, may progress to eclampsia. Factors associated with PEB include maternal age, parity, nutritional status, chronic diseases (such as hypertension and diabetes), and interpregnancy intervals (Lindheimer & Katz, 1989) Socio economic factors and delayed antenatal care (ANC) are also known contributors (Ministry of Health, 2022).

Given the severe maternal and perinatal implications ranging from placental abruption to intrauterine growth restriction (IUGR), prematurity, and asphyxia investigating the determinants of PEB during labour is essential for early detection, prevention, and effective management.

Methods

This research employed a systematic literature review approach. Relevant studies were collected from Google Scholar using the keywords “factors,” “preeclampsia,” and “labour”. Data sources were obtained from the Google Scholar database using the keywords “factors,” “preeclampsia,” and “labour.” Inclusion criteria consisted of Indonesian-language research articles, categorized as research articles, and focusing on factors influencing the incidence of preeclampsia. A total of 18 articles that met the inclusion criteria were analysed using a descriptive-thematic approach to identify patterns and interrelationships among variables. Inclusion criteria consisted of: (1) studies conducted in Indonesia; (2) written in Indonesian; (3) classified as research articles; and (4) focusing on factors influencing the incidence of preeclampsia. Exclusion criteria included: (1) theses or dissertations; and (2) inaccessible or restricted articles. Twenty eligible articles were analysed descriptively and thematically to identify common variables and interrelationships.

Results and Discussion

Follow list 18 journal Which found And explained in the form table:

Table 1. Jurnal Analysis Result

No	Researchers	Research Methods	Results
1	Correlation Between Preterm Labour in Severe Preeclampsia and Foetal Outcomes at Harapan Anda Islamic Hospital, Tegal (Putra et al., 2014)	Non-experimental study with a cross-sectional design involving 75 mothers delivering preterm who met inclusion and exclusion criteria.	There is a significant relationship between preterm labour and low birth weight (LBW), with severe preeclampsia increasing the incidence of LBW.
2	Relationship of Gestational Age, Abortion History, and Parity with Severe Preeclampsia at RSUD Abdoel Wahab Sjahranie 2022 (Sitohang et al., 2023)	Case-control study (retrospective) using chi-square analysis; variables included gestational age (<34 or >34 weeks), abortion history, and parity categories.	A significant relationship was found between gestational age, abortion history, and parity with the incidence of severe preeclampsia.
3	Relationship Between Preeclampsia and Preterm Labor (Sintawati, 2022)	Qualitative review collecting data from journals published between 2017 and 2021.	There is a significant correlation between preeclampsia and preterm labour.
4	Correlation Between Severe Preeclampsia and History of Caesarean Section with Current Caesarean Delivery at Harapan Anda Islamic Hospital, Tegal (Rossidah et al., 2023)	Quantitative retrospective-analytic study using Chi-square test and Odds Ratio (OR).	A significant correlation exists between severe preeclampsia, prior caesarean history, and current caesarean delivery.
5	Relationship Between Preeclampsia and Incidence of Low Birth Weight (LBW) and Neonatal Asphyxia at Abby Maternity Hospital, Lhokseumawe (Lubis et al., 2025)	Quantitative observational analytic study with a cross-sectional design.	A significant relationship was found between preeclampsia and both LBW and neonatal asphyxia.

6	Factors Associated with Severe Preeclampsia in Delivering Mothers at Medika Dramaga Hospital, Bogor (Syamsiah et al., 2022)	Descriptive-analytic study using secondary data with a cross-sectional design and purposive sampling.	There is a significant relationship between hypertension history and maternal age with severe preeclampsia.
7	Relationship Between Severe Preeclampsia and LBW and Neonatal Asphyxia at Dr. H. Moch Ansari Saleh Hospital, Banjarmasin (Setiyaningsih & Prihatanti, 2025)	Quantitative cross-sectional study with 295 respondents using Slovin’s formula and random sampling.	No significant effect of severe preeclampsia on LBW; however, there was a significant relationship with neonatal asphyxia.
8	Relationship Between Severe Preeclampsia (PEB) and Neonatal Asphyxia at RSUD Class B, Subang (Rayuna et al., 2019)	Quantitative analytic cross-sectional study using total sampling.	A significant relationship exists between severe preeclampsia and neonatal asphyxia.
9	Anxiety, History of Preeclampsia, and Current Preeclampsia Among Multigravida Women (Hardianti et al., 2018)	Observational analytic cross-sectional study analysed using Chi-square ($\alpha = 0.05$).	A significant relationship was found between anxiety, preeclampsia history, and the occurrence of preeclampsia.
10	Relationship Between Body Mass Index (BMI) and Preeclampsia in Pregnant Women at Trikora Salakan Hospital (Handayani & Nurjanah, 2021)	Retrospective descriptive-analytic study using total sampling and Spearman Rank test.	There is a significant correlation between BMI and the occurrence of preeclampsia in pregnant women.
11	Characteristics of Preeclampsia Patients in Labour at RSIA Sitti Khadijah 1 (2022–2023) (Daniel et al., 2024)	Descriptive retrospective study.	Severe preeclampsia most frequently occurred among high-risk age groups (too young or too old), primigravida or multigravida mothers, without hypertension history, and with low education levels.
12	Incidence of Severe Preeclampsia and Its Association with Caesarean Section (Ramdhanie & Yusnia, 2020)	Descriptive-analytic quantitative study with a cross-sectional approach.	A significant association was found between severe preeclampsia and caesarean section delivery.
13	Relationship Between Severe Preeclampsia and Preterm Delivery at Prof. Dr. R. D. Kandou Hospital, Manado 2021–2022 (Widjaja et al., 2024)	Descriptive-analytic case-control study design.	There is a significant relationship between severe preeclampsia and preterm delivery.
14	Relationship Between Foetal Position, Preeclampsia, and Premature Rupture of Membranes with Caesarean Delivery at Yadika Hospital, Kebayoran Lama 2021 (Siagian et al., 2023)	Analytical cross-sectional survey method.	Foetal position and premature rupture of membranes were significantly related to caesarean section, but preeclampsia showed no significant relationship.
15	Relationship Between Preeclampsia and Low Birth Weight (LBW) at Gambiran Hospital, Kediri (Chumaida et al., 2019)	Analytical correlational retrospective design.	A significant correlation was found between preeclampsia and the incidence of LBW.
16	Relationship Between Severe Preeclampsia in Delivering Mothers and Neonatal Asphyxia at Dr. H. Moch Ansari Saleh Hospital, Banjarmasin (Ulfa & Sinambela, 2019)	Quantitative analytic study using a cross-sectional approach.	A significant relationship was found between severe preeclampsia and neonatal asphyxia.

17	Relationship Between Post-term Pregnancy and Severe Preeclampsia with Neonatal Asphyxia (Alfatihah et al., 2024)	Analytical study using a cross-sectional approach.	A cross-sectional analytical study found an association between post-term pregnancy, severe preeclampsia, and neonatal asphyxia.
18	Relationship Between Parity and Maternal Education with Preeclampsia at Idaman Hospital, Banjarbaru (Sitohang et al., 2023)	Analytical survey using a case-control design with purposive sampling.	Parity showed a significant relationship with preeclampsia, while education did not.

Internal Factors

Maternal Age

Women giving birth at ages below 20 or above 35 have a higher risk of developing severe preeclampsia compared to those aged between 20 and 35 years. This age range is classified as a high-risk category due to physiological and vascular changes that may impair maternal adaptation during pregnancy. Women older than 35 are more prone to functional and structural degeneration of cells, particularly within vascular circulation, which can increase blood pressure levels. Research has consistently shown that respondents in the high-risk age group (<20 or >35 years) have the highest incidence of preeclampsia. Arwan and Sriyanti (2020) also reported that most preeclampsia cases occurred among women over 35 years of age, reaffirming that both very young and older maternal ages warrant close monitoring during pregnancy.

Gestational Age

According to Manuaba (1998), ischemia at the placental implantation site may trigger preeclampsia, with the risk increasing progressively as pregnancy advances. Preeclampsia occurring at gestational age >34 weeks is the most frequent and is believed to result from a mismatch between foetal metabolic demands and maternal placental supply due to ischemia. Early identification of women at risk of early- or late-onset preeclampsia and understanding its severity are essential for reducing maternal and neonatal morbidity.

History of Abortion

A history of abortion has been associated with thrombocytopenia and maternal immune responses against foetal platelet antigens targeting integrins expressed on trophoblasts, endothelial cells, and placental tissue. Trophoblasts and integrins play a crucial role in early implantation and placental development, including uterine spiral artery remodelling. When this process is inadequate, it may result in preeclampsia, intrauterine growth restriction (IUGR), or miscarriage (Yougbaré et al., 2017).

Vaginal bleeding lasting five or more days can increase the risk of preeclampsia. Doppler ultrasound and placental vascularization studies can detect such risks early. Poor placental vascularization often manifests as foetal bradycardia and abnormal umbilical artery flow (Ridder et al., 2019). Supporting findings from Norman et al (2024) indicate that a history of abortion significantly increases the likelihood of preeclampsia in subsequent pregnancies.

Parity

The optimal parity is two to three children. Mothers with more than five deliveries are more likely to experience pregnancy complications. In the first pregnancy, the formation of blocking antibodies against placental antigens is incomplete but improves with subsequent pregnancies. Primigravida women are more susceptible to preeclampsia than multigravida women because the condition often arises during first exposure to chorionic villi. This occurs because the immunological mechanism responsible for forming blocking antibodies via Human Leukocyte Antigen-G (HLA-G) against placental antigens is not yet fully developed, leading to impaired trophoblastic implantation in the maternal decidual tissue (Alcock et al., 2025).

History of Preeclampsia

Elevated blood pressure can lead to a direct reduction in plasma volume and consequently lower plasma albumin levels. Hypoalbuminemia contributes to increased vascular permeability, decreased osmotic pressure, and extravasation of intravascular fluid into tissues, resulting in oedema-a key clinical feature of severe preeclampsia (Wiedermann, 2024). Pregnant women with a previous history of preeclampsia are at high risk for recurrence. Approximately 20% of multigravida women with preeclampsia have experienced the condition in prior pregnancies (Bramham et al., 2011). Several pregnant women with recurrent preeclampsia consumed diets high in fat and salt, which increased very-low-density lipoprotein (VLDL) concentrations. Elevated VLDL promotes low-density lipoprotein (LDL) accumulation, leading to endothelial damage and vasoconstriction, which further elevate blood

pressure and promote intravascular fluid and protein loss, resulting in oedema (Perry et al., 2022).

External Factors

Anxiety

Pregnancy involves significant physical and psychological changes. For women with prior pregnancy complications, especially a history of preeclampsia, anxiety about recurrence may arise. Psychological stress activates the sympathetic nervous system and triggers the release of adrenaline, which increases maternal blood pressure and may precipitate preeclampsia. Thus, anxiety is considered an indirect yet significant external risk factor contributing to hypertensive disorders in pregnancy (Gangi et al., 2025).

Education and Knowledge

Studies show that women with low education levels (elementary or junior high school) have a 4.1-fold higher risk of preeclampsia during pregnancy, with a significant correlation ($p = 0.004$). Maternal education strongly influences health knowledge, including dietary patterns, which directly affect the risk of preeclampsia. Taslim et al (2016) found a significant relationship between diet and hypertension among pregnant women in the Kamonji Public Health Center area ($p = 0.012$). 53.3% of pregnant women with hypertension had high carbohydrate intake and frequently consumed fried snacks, biscuits, and chips daily. Many also consumed meatballs and fried noodles at least three times a week, in addition to increased overall food portions—contributing to a higher risk of hypertension and preeclampsia (Dary et al., 2025).

Conclusion and Suggestion

Severe preeclampsia (PEB) remains one of the leading causes of maternal and foetal morbidity and mortality in Indonesia and globally. Key influencing factors include maternal age, gestational age, parity, abortion history, prior hypertension or preeclampsia, body mass index (BMI), and delays in antenatal care (ANC). The reviewed studies demonstrate strong correlations between severe preeclampsia and various obstetric complications, including preterm labour, low birth weight (LBW), neonatal asphyxia, and increased caesarean delivery rates. These findings highlight the importance of early intervention, risk detection, and improving maternal health service quality. A comprehensive understanding of preeclampsia risk factors and outcomes is vital for healthcare providers, particularly midwives, to design effective promotive and preventive interventions that reduce maternal and neonatal morbidity and mortality.

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