

Literature Review: The Relationship Between Age and Parity with
The Incidence of Preeclampsia in Mothers Giving Birth

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Article Info	Abstract
Article History Submitted, 2026-04-12 Accepted, 2026-05-19 Published, 2026-06-30	Preeclampsia is a condition of high blood pressure that occurs during pregnancy, considered a major factor in health problems and death in mothers and newborns. Maternal parity and age are among the risk factors that can increase the risk of preeclampsia. Parity 2-3 is considered the safest parity level in terms of maternal mortality. Age significantly influences the duration of pregnancy and the delivery process. For women under 20 and over 35, pregnancy or delivery is not recommended. The purpose of this study was to analyze the relationship between age and parity in mothers giving birth with the incidence of preeclampsia. The research method was a literature review of 10 journal articles published between 2021 and 2025, focusing on quantitative research designs such as observational and analytical studies. The analysis results indicate a relationship between age and parity in mothers giving birth with the incidence of preeclampsia. Medical personnel can provide obstetric care for pregnant women at risk of preeclampsia to reduce maternal mortality through several methods, including early detection, education, and appropriate treatment. Medical personnel play a crucial role in early detection and early intervention to prevent more serious complications of preeclampsia.
Keywords: Age, parity, childbirth with preeclampsia	

Introduction

The maternal mortality rate (MMR) is an indicator used to measure women's health and is part of a country's development index and quality of life index. Indonesia, as a developing country, still faces a high maternal mortality rate compared to other developing nations (Febriyanti et al., 2023). According to information from the World Health Organization, the maternal mortality rate is very high. One maternal death occurred almost every two minutes in 2023. Between 2000 and 2023, the maternal mortality rate (MMR, the number of maternal deaths per 100,000 live births) decreased by about 40% globally. Nearly 260,000 women lost their lives during pregnancy and childbirth in 2023. Approximately 92% of maternal deaths occurred in low- and lower-middle-income countries in 2023, and most of these deaths were preventable (WHO, 2025). One of the main causes of death in pregnant women, besides bleeding, is preeclampsia. Preeclampsia is a condition that occurs before eclampsia and is a complication of pregnancy. Preeclampsia that occurs during pregnancy is often referred to as toxemia gravidarum, or pregnancy poisoning, and can cause sudden seizures during pregnancy (Lajuna et al., 2024).

Preeclampsia is a condition of high blood pressure that occurs during pregnancy and is considered a major factor in health problems and death in both mothers and newborns. This condition affects approximately 3% to 5% of pregnancies and is responsible for 60,000 maternal deaths and 500,000 fetal deaths annually worldwide. Preeclampsia is known as a hypertensive disorder that poses the greatest health risk to pregnant women and their fetuses (Setyorini et al., 2026). One factor that can contribute to the development of preeclampsia is the mother's age. Age significantly influences the duration of pregnancy and the delivery process. For women under 20 and over 35, pregnancy or childbirth is not recommended. At these ages, the risk of miscarriage is very high, even leading to maternal and infant death. Age is a factor in the development of preeclampsia/eclampsia. The optimal age for pregnancy is between 20 and 35 (Nurjanah et al., 2025).

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Another factor contributing to the development of preeclampsia is maternal parity. Giving birth more than five times can increase the risk for pregnant women, as the reproductive organs, particularly the uterine muscles, experience decreased strength, which can hinder the birth process. Parity 2-3 is considered the safest parity level in terms of maternal mortality. The first parity level is associated with a mother's lack of experience and understanding of care during pregnancy. Parity 2-3 is the safest parity level. Parity one and high parity (more than 3) carry a higher risk of preeclampsia. Mothers with high parity (>4) often experience decreased reproductive function. In addition, they are generally too busy with household activities, which can lead to fatigue. As a result, they pay less attention to diet, resulting in inadequate nutritional intake during pregnancy (Rospia, Novidaswati & Cahyaningtyas, 2021)

A study conducted at the Obstetrics Clinic of Ibnu Sina Islamic Hospital, West Pasaman, on the relationship between parity and the incidence of preeclampsia yielded a p value of 0.002, which is smaller than 0.05 based on the Chi-Square test. This indicates a relationship between parity and the incidence of preeclampsia. Based on the findings of the study, the highest number of parities occurred in mothers who experienced preeclampsia. Of the 55 respondents, 26 pregnant women (47.3%) had low or non-risk parities, namely less than 3. Meanwhile, the other 29 pregnant women (52.7%) had parities considered high risk, namely more than 4 (Amalina, Kasoema & Mardiah, 2022). Previous studies have yielded mixed findings regarding the impact of parity and age on preeclampsia. Parity 2-3 is the safest level of preeclampsia risk, and the risk increases in women who have had multiple pregnancies (grandemultigravida) and those at high-risk maternal ages, namely over 35 and under 20 (Fahrani, Sari & Ramadhaniati, 2020).

Methods

This study used a systematic literature review method to examine and analyze the relationship between parity and age and the incidence of preeclampsia in women, based on previous research findings. A systematic literature review was chosen because it allows researchers to collect, select, and analyze various relevant study results objectively and comprehensively, thus providing a comprehensive understanding of the topic under study. This approach also helps identify research gaps and formulate evidence-based.

Recommendations for health practices in the field: 1) Inclusion criteria for selecting articles included, 2) Articles published within the last five years, namely between 2021 and 2026; 3) Articles written in Indonesian or English; 4) Articles that directly or indirectly discuss the relationship between parity and age and the incidence of preeclampsia; 4) Articles that are the result of scientific research in journal form, not opinion pieces, editorials, or individual case reports. Exclusion criteria included: 1) Articles that are not available in full text or cannot be accessed in full; and 2) Articles that only discuss one variable (parity, age, and preeclampsia) without explicitly explaining the relationship.

Articles were screened taking into account the inclusion and exclusion criteria. The selection process was carried out systematically and in layers, starting with a review of the title and abstract, and continuing with an evaluation of the full content of each article. After the screening process was completed, 10 scientific articles were selected that were deemed to best meet the requirements, both in terms of research methodology, writing quality, and relevance to the focus of this study. Each selected article was analyzed using a thematic analysis approach. This analysis was conducted by grouping the content of each article based on several key aspects: the research objectives, methods used, key findings, and the article's contribution to the understanding of the relationship between parity, age, and preeclampsia. Furthermore, researchers identified emerging patterns, such as frequently mentioned risk factors, the mechanisms suspected to underlie the association between parity, age, and preeclampsia, and intervention or prevention strategies proposed in various studies.

Through this literature review approach, it is hoped that the research will present a synthesis of valid and up-to-date data and provide a comprehensive overview of how preeclampsia contributes to the risk of preterm birth. The results of this analysis will not only enrich the body of knowledge in obstetrics and perinatology but also serve as a scientific basis for the development of more effective early screening strategies, medical interventions, and prevention policies, particularly in the context of the Indonesian healthcare system, which has its own unique characteristics and challenges.

Results and Discussion

Table 1. Results of Journal Analysis

No	Research	Method	Results
1.	The relationship between age and parity with the incidence of preeclampsia in mothers giving birth at Banten Regional Hospital. Magdalena & Astuti (2024)	The research method used in this study is cross-sectional.	Bivariate Analysis Results There is a relationship between maternal age and the incidence of preeclampsia in mothers giving birth (p value = 0.000). There is a relationship between parity and the incidence of preeclampsia in mothers giving birth (p value = 0.000).
2.	The Relationship between Age and Parity of the Mother Giving Birth and the Incidence of Preeclampsia in the Obstetrics Room of Datu Kandang Haji Balangan Regional Hospital. Karini <i>et al.</i> (2025)	Quantitative research type with case control research design	Based on the results of the study, the results of the Chi Square test for maternal age showed a p-value of 0.000 with an OR (95% CI) of 7.203 (3.821 - 13.577) and for the parity variable, the p-value was 0.000 with an OR (95% CI) of 6.053 (3.302-11.095). Based on the results of the study, it was found that there was a significant relationship between the age and parity of the mother giving birth with the incidence of preeclampsia.
3.	The Relationship of Labor Mother Age and Parity with Preeclamsia in Pratama Martua Sudarlis Clinic Medan 2023. Hutahaean, Simanjuntak & Sinaga (2024)	This research is an analytical survey with cross sectional method approach	The results of research on 30 mothers with pre-eclampsia based on age 20-35 years majority did not risk as much as 22 people (73,3%). Based on primipara parity majority do not risk as many as 18 people (60,9%). Based on severe preeclampsia the majority of 15 people (50.0%). The result of bivariate study showed that there was a correlation between age and pre-eclampsia with p-value (p-0,001) and there was a parity relationship with pre-eclampsia with p-value (p-0,003).
4.	The Relationship Between Age and Parity with the Incidence of Preeclampsia in Pregnant Women in Bondowoso. Puspitasari (2026)	This study uses a quantitative approach with a cross-sectional design.	The results showed that most respondents were aged 20–35 years (53.3%) and had a parity that was not at risk (55.8%). The results of the Chi-Square test showed a significant relationship between maternal age and the incidence of preeclampsia (p-value = 0.048) and a significant relationship between parity and the incidence of preeclampsia (p-value = 0.024).
5.	The relationship between age and parity with the incidence of preeclampsia in mothers giving birth at Banten Regional Hospital in 2024. Heddy, Marfuah, & Anandy (2024)	This type of research is an analytical survey with a cross-sectional research design.	The results of the univariate statistical test showed that the majority of mothers who did not experience preeclampsia were 248 respondents (77%), those aged 20-35 years who were not at risk were 230 respondents (80.1%), those who were not at risk of parity were primigravida and multigravida were 258 respondents (80.1%). And the results of the bivariate analysis showed a relationship between maternal age and the incidence of preeclampsia in mothers giving birth (p value = 0.000). There was a relationship between parity and the incidence of preeclampsia in mothers giving birth (p value = 0.000).
6	The Relationship Between Maternal Age and Parity with Preeclampsia at the Martua Sudarlis Primary Clinic in Medan in 2022. Hutahaean (2022)	This research is an analytical survey with a cross-sectional method approach.	The results of the study conducted on 30 mothers giving birth with preeclampsia based on age 20 - 35 years, the majority were not at risk as many as 22 people (73.3%). Based on parity, the majority of primiparas were not at risk as many as 18 people (60.9%). Based on severe preeclampsia, the majority were 15

			people (50.0%). The results of the bivariate study showed that there was a relationship between age and preeclampsia obtained a sig p-value (p=0.001) and there was a relationship between parity and the incidence of preeclampsia with a sig p-value (p=0.003).
7	Factors Associated with the Incidence of Preeclampsia in Pregnant Women at Pambalah Batung Regional Hospital. Sari, Ningrum & Yuandari, (2023)	Method: The research used a quantitative method with a descriptive analytical design with cross sectional.	Results: The results of the study showed a relationship between age (p=0.002), parity (p=0.000), history of hypertension (p=0.000) and history of preeclampsia (p=0.000) with the incidence of preeclampsia in pregnant women. There was no relationship between obesity and the incidence of preeclampsia in pregnant women (p=0.662>0.05).
8	Relationship between Age and Parity with Late Onset Severe Preeclampsia at PKU Muhammadiyah Surabaya Hospital. Ariningtyas <i>et al.</i> (2025)	This study used a cross-sectional study design	In the analysis obtained for the relationship between age and preeclampsia, the large p-value is 0.16 <0.05. The relationship of parity with preeclampsia is 0.004 < 0.05, thus proving a relationship between age and parity with late-onset severe preeclampsia at PKU Muhammadiyah Surabaya Hospital. In conclusion, there is a relationship between age and parity with late-onset severe preeclampsia at PKU Muhammadiyah Surabaya Hospital.
9	The relationship of age, parity, and history of hypertension with the incidence of preeclampsia among women giving birth at Ahmad Yani Regional General Hospital, Metro City.. Redowati (2021)	This study employs a survey design, followed by an analysis of the correlational dynamics between phenomena or between risk factors and outcome factors. The study design is cross-sectional.	The study results showed that among the 299 respondents, 266 (89.0%) did not experience preeclampsia, while 33 (11.0%) did. Regarding age, 180 (60.2%) were aged 20–35 years, 65 (21.7%) were over 35 years old, and 54 (18.1%) were under 20 years old. In terms of parity, 184 (61.5%) were multiparous, 82 (27.4%) were primiparous, and 33 (11.0%) were grand multiparous. Finally, 238 (79.6%) had no history of hypertension, while 61 (20.4%) had a history of hypertension.
10	The Relationship between Age and Parity of Pregnant Women and the Incidence of Preeclampsia at the Siti Fatimah Mother and Child Hospital in Makassar. Nasution, Syuaib & Delima, (2024)	This research method is quantitative research with an observational approach and uses a cross-sectional method.	The results of the study showed that there was a significant relationship between the age of pregnant women and the incidence of preeclampsia (p=0.041), there was a significant relationship between the parity of pregnant women and the incidence of preeclampsia (p=0.016), and there was a significant relationship between preeclampsia and the incidence of LBW (p=0.023).

Based on the results of a systematic literature review of 10 scientific articles that met the inclusion criteria, the majority of studies found a significant association between maternal age and parity with the incidence of preeclampsia. This finding was consistent across various study designs, both cross-sectional and case-control, thus strengthening the validity of the relationship between these two variables and the incidence of preeclampsia.

The Relationship Between Maternal Age and the Incidence of Preeclampsia

The study results indicate that maternal age has a significant relationship with the incidence of preeclampsia. Research by Magdalena & Astuti (2024) reported a p-value of 0.000, indicating a significant association between maternal age and the incidence of preeclampsia. Similar results were also found by Karini et al. (2025) with a p-value of 0.000 and an OR of 7.203 (95% CI: 3.821–13.577), meaning that mothers of high-risk age are more than seven times more likely to experience preeclampsia than those of non-risk age.

Furthermore, research by Purpitasari (2026) showed a significant association with a p-value of 0.048, as did research by Nasution, Syuaib & Delima (2024) with a p-value of 0.041.

This finding is supported by research by (Redowati, 2021), which showed that preeclampsia is more prevalent in extreme age groups (<20 years and >35 years). Theoretically, those aged <20 years and >35 years are considered high-risk pregnancy groups. In those aged <20 years, reproductive organs are not yet optimally developed, increasing the risk of pregnancy complications, including preeclampsia. Meanwhile, at the age of >35 years, a degenerative process occurs in the blood vessels which causes a decrease in vascular elasticity and increases the risk of hypertension (Prawirohardjo, 2020)

Furthermore, according to the pathophysiological theory of preeclampsia, the primary disruption occurs during trophoblast invasion into the spiral arteries, leading to suboptimal placental perfusion. This condition is more likely to occur at extreme ages due to an imbalance in the body's physiological adaptation to pregnancy (Cunningham et al., 2022). However, there is variation in results across studies. For example, (Ariningtyas et al., 2025) showed a p-value approaching the significance limit. This may be influenced by sample size, population characteristics, and the presence of confounding variables such as nutritional status, medical history, and access to healthcare.

The Relationship Between Parity and the Incidence of Preeclampsia

Parity is another important factor associated with the incidence of preeclampsia. Nearly all articles in this review demonstrated a significant association between parity and preeclampsia. Research by Karini et al. (2025) showed an OR of 6.053 (95% CI: 3.302–11.095), meaning that mothers with higher parity were six times more likely to develop preeclampsia. Research by Magdalena & Astuti (2024), Hutahaeen (2022), and Nasution, Syuaib & Delima (2024) also showed a p-value <0.05, confirming the association between parity and preeclampsia. Theoretically, primigravidae are at higher risk of developing preeclampsia because the mother's body is exposed to fetal antigens for the first time, meaning the maternal immune response has not yet been optimally established. This leads to immunological adaptation disturbances that play a role in the pathogenesis of preeclampsia (Robert & Hubel, 2009).

On the other hand, grandemultiparas also have a high risk due to decreased reproductive organ function and an increased likelihood of comorbidities such as chronic hypertension. This condition can worsen blood vessel endothelial function and increase the risk of preeclampsia. Conversely, mothers with 2–3 parities (multiparas) generally have a lower risk because the body has adapted to previous pregnancies, both physiologically and immunologically. This finding aligns with research by Sari, Ningrum & Yuandari (2023) which showed a significant association between parity and preeclampsia ($p=0.000$). This suggests that parity is an important determinant of preeclampsia incidence.

Interaction of Age and Parity on the Incidence of Preeclampsia

The analysis shows that age and parity not only act independently but also interact to increase the risk of preeclampsia. Mothers at risk (<20 or >35 years) who also have extreme parity (primigravida or grandemultipara) have a higher risk compared to mothers of normal age and parity. This suggests that preeclampsia is a multifactorial condition influenced by a combination of risk factors. The interaction between biological factors (age), reproductive factors (parity), and other health factors can worsen a mother's condition during pregnancy. This finding is supported by research by Hutahaeen (2022), which showed that both age and parity together have a significant association with the incidence of preeclampsia ($p<0.05$).

Confounding Factors in the Occurrence of Preeclampsia

In addition to age and parity, several studies have also identified other factors associated with the incidence of preeclampsia. Research by Hutahaeen (2022) showed that a history of hypertension and a history of preeclampsia were highly significant ($p=0.000$).

Other factors that also play a role include: History of chronic disease, nutritional status, obesity, quality of antenatal care (ANC) services. However, not all studies show consistent results. For example, obesity was not always significantly associated with preeclampsia in all studies. This indicates variations in population characteristics and research methodology. Therefore, it is important for future research to control for confounding variables to obtain more accurate results.

Implications in Midwifery Practice

The results of this literature review have important implications for midwifery practice and maternal health services, including: 1) Increasing high-risk screening. Mothers aged <20 years, >35 years, primigravidas, and grandemultiparas require special attention; 2) Optimizing ANC services. Routine prenatal checkups can help detect preeclampsia early, maternal health education, pregnant women need to be provided with information about the risk factors and warning signs of preeclampsia; 3) Preventing complications. Early treatment can prevent serious complications such as eclampsia, low birth weight (LBW), and maternal and infant mortality.

Conclusion

Based on the results of data analysis and discussion, the author draws the following conclusions from the study on the relationship between preeclampsia delivery and maternal age and parity: This study shows a significant relationship between maternal age and parity with the incidence of preeclampsia, where mothers with high-risk ages (<20 years or >35 years) and certain parity have a higher likelihood of experiencing these complications. The results confirm that age and number of deliveries (parity) play a role in the occurrence of preeclampsia, with higher risk in both primiparous and multiparous mothers under certain conditions. This study found a correlation between maternal age and parity with the incidence of preeclampsia, where biological factors and previous pregnancy experiences influence the condition. In general, the analyzed studies consistently show that extreme maternal age and certain parity increase the risk of preeclampsia in delivering mothers.

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