

FACTORS ASSOCIATED WITH THE INCIDENCE OF PREECLAMPSIA AMONG PREGNANT WOMEN

Dwi Utami Ningtias¹, Dwi Ratna Prima^{2*}, Fitria Endah Purwani³, Marinem⁴

¹Midwifery Professional Education Study Program, Budi Kemuliaan College of Health Sciences, Indonesia

²Bachelor of Midwifery Study Program, Budi Kemuliaan College of Health Sciences, Jakarta, Indonesia

³Bachelor of Midwifery Study Program, Budi Kemuliaan College of Health Sciences, Jakarta, Indonesia

⁴Midwifery Professional Education Study Program, Budi Kemuliaan College of Health Sciences, Indonesia

Corresponding author: daneshaaazraf@gmail.com

ABSTRACT

Preeclampsia is one of the leading causes of maternal and fetal morbidity and mortality. Several maternal factors, including maternal age, parity, history of preeclampsia, pregnancy interval, and the frequency of antenatal care (ANC) visits, are considered to be associated with the occurrence of preeclampsia. Identifying these risk factors is essential to support early detection and the prevention of pregnancy complications. Objective: To determine the relationship between maternal age, parity, history of preeclampsia, pregnancy interval, and the frequency of antenatal care (ANC) visits and the occurrence of preeclampsia among pregnant women at Grogol Petamburan Primary Health Center in 2025. Methods: This study employed a quantitative research design with a cross-sectional approach. The study population consisted of all pregnant women diagnosed with preeclampsia at Grogol Petamburan Primary Health Center from January to December 2025, totaling 259 respondents selected using the total sampling technique. Data were obtained from medical records. Data analysis included univariate analysis to describe the frequency distribution of each variable and bivariate analysis using the Chi-square test with a significance level of 95% ($\alpha = 0.05$). Results: Most respondents had preeclampsia (73.7%), while 26.3% had severe preeclampsia. Bivariate analysis showed significant associations between maternal age ($p=0.001$; OR=10.406; 95% CI: 4.715–22.969), parity ($p=0.001$), history of preeclampsia ($p=0.001$; OR=8.411; 95% CI: 4.448–15.905), pregnancy interval ($p=0.001$; OR=5.465; 95% CI: 2.874–10.391), and the frequency of antenatal care (ANC) visits ($p=0.001$) and the occurrence of preeclampsia. Conclusion: There were significant associations between maternal age, parity, history of preeclampsia, pregnancy interval, and the frequency of antenatal care (ANC) visits and the occurrence of preeclampsia among pregnant women at Grogol Petamburan Primary Health Center in 2025. The findings of this study are expected to support efforts to improve early detection and monitoring of pregnant women at risk of preeclampsia through optimal antenatal care services.

Keywords: Antenatal Care, Maternal Age, Preeclampsia, Risk Factors, Parity

1. INTRODUCTION

The three leading causes of maternal mortality are hemorrhage (30%), hypertension during pregnancy (25%), and infection (12%). The WHO estimates that the incidence of preeclampsia is seven times higher in developing countries than in developed countries. The prevalence of preeclampsia ranges from 1.3% to 6% in developed countries, whereas in developing countries, it ranges from 1.8% to 18%. In Indonesia, the incidence of preeclampsia stands at 128,273 cases per year, or approximately 5.3%. Trends over the past two decades show no significant decline in the incidence of preeclampsia, contrasting with the incidence of infection, which has steadily decreased alongside advancements in antibiotic therapy. Maternal deaths due to preeclampsia in Indonesia reached 7,389 cases in 2021, an increase from the previous year. Globally, approximately 14% of pregnant women experience preeclampsia, a condition that contributes to the deaths of around 76,000 mothers and 500,000 fetuses annually particularly in developing countries due to the serious complications it can cause. The leading causes of maternal mortality in 2023 were preeclampsia (412 cases), obstetric hemorrhage (360 cases), and other obstetric complications (204 cases).¹

A study conducted by Jellabing (2023) at Prof. Dr. W. Z. Johannes Regional General Hospital (RSUD) in Kupang found that maternal age during pregnancy was a significant risk factor for preeclampsia ($p=0.007$; $OR=3.559$), while a history of pre-existing hypertension was also proven to be a risk factor ($p=0.034$; $OR=3.981$). Conversely, gravidity status ($p=0.401$; $OR=0.642$) and multiple pregnancy ($p=1.000$; $OR=1.000$) were not found to be risk factors in that study. Research by Saputri (2023) at Anutapura General Hospital (RSU) in Palu demonstrated that parity ≥ 3 ($OR=3.000$; 95% CI: 1.424–6.319), a history of hypertension ($OR=10.846$; 95% CI: 4.646–25.319), and an Antenatal Care (ANC) frequency of fewer than four visits ($OR=2.307$; 95% CI: 1.097–4.850) were significant risk factors for the incidence of preeclampsia.

In 2022, there were 25 cases of maternal death in DKI Jakarta caused by preeclampsia.

Data from 2024 revealed 105 cases of pregnant women with preeclampsia complications, representing 32.4% of the total number of pregnant women who underwent ANC at Grogol Petamburan Community Health Center (Puskesmas). Data from the 2025 Monthly Report 3 on Maternal and Child Health (LB3-KIA) for the West Jakarta region regarding cases of severe preeclampsia as a pregnancy complication shows the following figures: Cengkareng Community Health Center (Puskesmas) recorded 305 cases, Grogol Petamburan Puskesmas, 259 cases, Kebon Jeruk Puskesmas, 158 cases, Kalideres Puskesmas, 141 cases, Tambora Puskesmas, 110 cases, Kembangan Puskesmas, 84 cases, and Palmerah Puskesmas, 34 cases.⁵

Given the background information highlighting the significant issue of preeclampsia in Indonesia particularly at Grogol Petamburan Community Health Center (Puskesmas) and noting the existing inconsistencies in research findings regarding preeclampsia risk factors, the researcher aims to analyze the factors associated with the incidence of preeclampsia among pregnant women at Grogol Petamburan Community Health Center during the period of January to December 2025. The study will examine variables such as maternal age, parity, history of preeclampsia, interpregnancy interval, and frequency of Antenatal Care (ANC) visits. The objective is to facilitate appropriate preventive measures, early detection, and interventions, thereby reducing the risk of pregnancy complications and supporting the reduction of the Maternal Mortality Rate (MMR).

2. METHODS

This study uses a quantitative analytical survey research design with a Cross Sectional method. This study was conducted to analyze factors related to the incidence of Preeclampsia in pregnant women at Grogol Petamburan Health Center. This study was conducted from January to December 2025. The population in this study were all pregnant women diagnosed with Preeclampsia and severe preeclampsia in the cohort of pregnant women recorded at Grogol Petamburan Health Center from January to

December 2025, totaling 259 people. The method of determining the sample size used Total Sampling. The study sample was pregnant women who met the inclusion and exclusion criteria. Inclusion Criteria: 1) All pregnant women diagnosed with Preeclampsia in medical records at Grogol Petamburan Health Center from January to December 2025, 2) Mothers with a single fetus, 3) Pregnant women with a gestational age of >20 weeks, 4) Complete medical records according to the research variables. Exclusion Criteria: 1) Lack of complete medical records, 2) Mothers with heart and kidney disease, or other comorbidities. The sample for this study was drawn using a non-probability sampling technique with the Total Sample method. The data collection instrument used was a checklist. Data analysis used univariate and bivariate analysis using computerized methods using the Chi-Square statistical test.

The research flowchart can be described as follows: the study began with problem identification and a literature review served as the foundation for the study's design. Subsequently, the researcher obtained research authorization from the Community Health Center (Puskesmas), identified the study population, collected data based on inclusion criteria, and processed and analyzed the data using SPSS software. The analysis results were presented in tables and narrative form, which then formed the basis for drawing the study's conclusions.

3. RESULTS

1. Preeclampsia Incidence Among Pregnant Women at Grogol Petamburan Community Health Center in 2025

Incidence of Preeclampsia	f	%
Preeclampsia	191	73,7
Severe Preeclampsia	68	26,3
Total	259	100,0

Based on Table 1, it is evident that among the 259 pregnant women, the majority experienced preeclampsia (73.7%), while the remainder experienced severe preeclampsia (26.3%).

2. Frequency Distribution of Pregnant Women's Age at Grogol Petamburan Community Health Center in 2025

Age Category	f	%
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Low Risk (20–35 years)	119	45,9
At Risk (<20 and >35 years)	140	54,1
Total	259	100,0

table 2 shows that, among the 259 pregnant women participating in the study, the majority fell into the high-risk age categories (<20 years and >35 years), comprising 140 respondents (54.1%), whereas 119 respondents (45.9%) were in the non-risk age category (20–35 years).

3. Frequency Distribution of Parity among Pregnant Women at Grogol Petamburan Community Health Center in 2025

Parity	f	%
Nulliparous	53	20,5
Primiparous	77	29,7
Multiparous	98	37,8
Grand multipara	31	12,0
Total	259	100,0

Table 3 shows that among the 259 pregnant women participating in the study, the largest group consisted of multiparous women (98 respondents, or 37.8%), while the smallest group comprised grand multiparous women (31 respondents, or 12.0%).

4. Frequency Distribution of Preeclampsia History Among Pregnant Women at Grogol Petamburan Community Health Center in 2025

History of Preeclampsia	f	%
No	196	75,7
Yes	63	24,3
Total	259	100,0

Based on Table 4, the majority of pregnant women (196 respondents, or 75.7%) had no history of preeclampsia, whereas 63 respondents (24.3%) had a history of preeclampsia.

5. Frequency Distribution of Preeclampsia History Among Pregnant Women at Grogol Petamburan Community Health Center in 2025

Pregnancy Spacing	f	%
Low risk (2–10 years)	131	50,6
At risk (<2 and >10 years)	128	49,4
Total	259	100,0

Table 5 shows that among the 259 pregnant women participating in the study, the majority

(131 respondents or 50.6%) had a non-risk pregnancy interval (2–10 years), while 128 respondents (49.4%) had a high-risk pregnancy interval (<2 years and >10 years).

6. Frequency Distribution of Pregnant Women's ANC Visits at Grogol Petamburan Community Health Center in 2025

ANC frequency	f	%
≥ 6 visits	154	59,5
< 6 visits	90	34,7
No ANC visits	15	5,8
Total	259	100,0

Table 4.6 shows that among the 259 pregnant women participating in the study, the majority (154 respondents or 59.5%) attended six or more antenatal care (ANC) visits. Meanwhile, 90 respondents (34.7%) attended fewer than six visits, and 15 respondents (5.8%) did not attend any ANC visits.

7. The Relationship Between Age and the Incidence of Preeclampsia Among Pregnant Women at Grogol Petamburan Community Health Center in 2025

Age	Preeclam psia	Severe Preecla mpsia	Total	P- value	OR (95% CI)
Low risk (20–35 years)	111 (93,3%)	8 (6,7%)	119 (100%)	0,001	10,406 (4,715
At risk (<20 and >35 years)	80 (57,1%)	60 (42,9%)	140 (100%)		– 22,969)

Chi-Square test yielded a p-value of 0.001 ($p < 0.05$), leading to the conclusion that there is a significant association between age and the occurrence of preeclampsia in pregnant women. An Odds Ratio (OR) of 10.406 (95% CI: 4.715–22.969) indicates that pregnant women in the high-risk age group (<20 years or >35 years) are 10.4 times more likely to develop preeclampsia compared to those in the non-risk age group.

8. The Relationship Between Parity and the Incidence of Preeclampsia Among Pregnant Women at the Grogol Petamburan Community Health Center in 2025

Parity	Preeclam psia	Severe Preecla mpsia	Total	P-value
Nulliparous	35 (66,0%)	18 (34,0%)	53 (100%)	

Primiparous	65 (84,4%)	12 (15,6%)	77 (100%)	0,001
Multiparous	78 (79,6%)	20 (20,4%)	98 (100%)	

Chi-Square test yielded a p-value of 0.001 ($p < 0.05$). thus, it can be concluded that there is a significant association between parity and the occurrence of preeclampsia in pregnant women. The highest proportion of severe preeclampsia was found in the grand multipara group (58.1%), followed by the nullipara group (34.0%).

9. The Relationship Between a History of Preeclampsia and the Incidence of Preeclampsia Among Pregnant Women at the Grogol Petamburan Community Health Center in 2025

History of Preeclam psia	Preeclam psia	Severe Preecla mpsia	Total	P- value	OR (95% CI)
No	166 (84,7%)	30 (15,3%)	196 (100%)	0,001	8,411 (4,448
Yes	25 (39,7%)	38 (60,3%)	63 (100%)		– 15,905)

Chi-Square test yielded a p-value of 0.001 ($p < 0.05$), leading to the conclusion that there is a significant association between a history of preeclampsia and the occurrence of preeclampsia in the current pregnancy. The Odds Ratio (OR) of 8.411 (95% CI: 4.448–15.905) indicates that pregnant women with a history of preeclampsia are 8.4 times more likely to develop severe preeclampsia compared to those without such a history.

10. The Relationship Between Pregnancy Spacing and the Incidence of Preeclampsia Among Pregnant Women at the Grogol Petamburan Community Health Center in 2025

Pregnancy Spacing	Preeclam psia	Severe Preecla mpsia	Total	P- value	OR (95% CI)
No	116 (88,5%)	15 (11,5%)	131 (100%)	0,001	5,465
Yes					

At risk	75	53	128	(2,874–10,391)
	(58,6%)	(41,4%)	(100%)	

Chi-Square test yielded a p-value of 0.001 ($p < 0.05$), leading to the conclusion that there is a significant association between interpregnancy interval and the occurrence of preeclampsia in pregnant women. The Odds Ratio (OR) of 5.465 (95% CI: 2.874–10.391) indicates that pregnant women with a high-risk interpregnancy interval (<2 years or >10 years) are 5.5 times more likely to develop preeclampsia compared to those with a non-risk interval.

11. The Relationship Between ANC Frequency and the Incidence of Preeclampsia Among Pregnant Women at Grogol Petamburan Community Health Center in 2025

ANC Frequency	Preeclampsia	Severe Preeclampsia	Total	P-value
≥ 6 visits	141 (91,6%)	13 (8,4%)	154 (100%)	0,001
< 6 visits	45 (50,0%)	45 (50,0%)	90 (100%)	
No ANC visits	5 (33,3%)	10 (66,7%)	15 (100%)	

Chi-Square test yielded a p-value of 0.001 ($p < 0.05$), leading to the conclusion that there is a significant association between the frequency of Antenatal Care (ANC) visits and the occurrence of preeclampsia in pregnant women. The lower the frequency of ANC visits, the higher the proportion of severe preeclampsia (SEVERE PREECLAMPSIA) cases; the rate rose from 8.4% among women with six or more visits to 66.7% among those who had never attended ANC.

4. DISCUSSION

The study results indicate that among the 259 pregnant women participating in the research, the majority (73.7%) experienced preeclampsia, while 26.3% progressed to severe preeclampsia. This proportion of severe preeclampsia is notably high compared to the general prevalence of preeclampsia in the overall obstetric population—which typically

ranges from 2% to 8%—but it is important to note that this study did not involve the general pregnant population; rather, it focused on women already diagnosed with preeclampsia at the Grogol Petamburan Community Health Center (Puskesmas). Consequently, the fact that severe preeclampsia accounted for one-quarter of these cases reflects the severity within a high-risk group, rather than the general incidence of preeclampsia among pregnant women.

Regarding age, more than half of the women (54.1%) fell into the high-risk age categories (under 20 or over 35 years old), while the remainder (45.9%) were within the healthy reproductive age range (20–35 years old). This high proportion of women in high-risk age groups aligns with the characteristics of the Grogol Petamburan Community Health Center's service area—a densely populated urban zone—which generally sees patterns of both early marriage and pregnancy at an older age (often due to delaying pregnancy for educational or career reasons).

Regarding parity, the largest proportion fell into the multiparous group (37.8%), followed by primiparous (29.7%), nulliparous (20.5%), and grandemultiparous (12.0%) women. This pattern indicates that the majority of pregnant women with preeclampsia in this study were not primigravidae—as is commonly assumed in much of the literature—but rather women with a history of more than one birth; this highlights the importance of maintaining vigilance for preeclampsia beyond just the first pregnancy.

In terms of preeclampsia history, the majority of women (75.7%) had no prior history of the condition, while 24.3% did. Although the proportion of women with a history of preeclampsia was smaller, this group warrants special attention, given that such a history proved to be one of the strongest predictors of recurrence in this study.

Regarding the pregnancy interval variable, the proportions of the non-at-risk group (50.6%) and the at-risk group (49.4%) were nearly balanced. This indicates that almost half of the pregnant women in the study area had suboptimal pregnancy intervals (either too short or too long), a situation that may reflect

suboptimal utilization of postpartum family planning services in the region.

Regarding the frequency of Antenatal Care (ANC) visits, the majority of mothers (59.5%) met the standard (≥ 6 visits); however, 34.7% had fewer than six visits, and 5.8% had no ANC visits at all. These figures indicate that ANC coverage in the Grogol Petamburan Community Health Center's service area is not yet fully optimal, given that nearly 40% of pregnant women failed to meet the recommended minimum number of visits, thereby reducing opportunities for the early detection of preeclampsia in this group.

Overall, the profile of pregnant women in this study reveals that the population with preeclampsia at the Grogol Petamburan Community Health Center presents a combination of overlapping risk factors including age, parity, obstetric history, interpregnancy interval, and suboptimal ANC adherence—underscoring the need for a comprehensive early detection approach that does not focus on a single risk factor in isolation.

Association Between Age and the Incidence of Preeclampsia

Analysis results indicate that among 119 pregnant women in the non-risk age group (20–35 years), only 8 (6.7%) developed severe preeclampsia, whereas among 140 pregnant women in the high-risk age group (<20 or >35 years), 60 (42.9%) developed severe preeclampsia ($p = 0.001$; OR = 10.406; 95% CI: 4.715–22.969). This means that women in the high-risk age group had 10.4 times higher odds of developing severe preeclampsia compared to the non-risk group; furthermore, as the entire CI range lies above 1, this association is statistically significant and clinically substantial.

Theoretically, very young age is associated with suboptimal spiral artery remodeling by trophoblasts, while advanced age is linked to vascular aging and the accumulation of metabolic comorbidities; both pathways culminate in the endothelial dysfunction that underlies preeclampsia.⁹

These findings align with Susilawati (2025) who identified a significant association between age and preeclampsia as well as with international studies by Padhan et al. (2023) and Anto et al. (2023).^{10,11}

Based on these results, maternal age is a factor associated with the severity of preeclampsia. Pregnant women in high-risk age groups (under 20 and over 35 years old) are more likely to experience severe preeclampsia compared to those within the optimal reproductive age range. Therefore, maternal age should be a key consideration in the delivery of antenatal care to facilitate the early detection and management of preeclampsia.

The Relationship Between Parity and the Incidence of Preeclampsia

The study results indicate that the highest proportion of severe preeclampsia was found in the grandmultiparous group (58.1%), while the lowest proportion was observed in the primiparous group (15.6%). Chi-square test results revealed a significant association between parity and the incidence of preeclampsia in pregnant women ($p=0.001$). As the parity variable comprised four categories, an Odds Ratio (OR) was not calculated.

These findings align with the theory that nulliparous women face a higher risk of preeclampsia; this is attributed to the fact that the first pregnancy involves initial exposure to paternal antigens that the immune system has not yet fully tolerated. Conversely, in the grandmultiparous group, the increased risk of preeclampsia is influenced by physiological changes resulting from repeated pregnancies such as reduced uterine elasticity and altered vascular function which are further exacerbated by advancing maternal age and potential comorbidities. These changes can impair uteroplacental perfusion, thereby increasing susceptibility to preeclampsia.⁶

These findings are also consistent with research by Susilawati (2025) and a systematic review by Duckitt and Harrington (2005), both of which demonstrate an association between parity and the incidence of preeclampsia.¹² Variations in incidence proportions across studies may be attributed to differences in respondent characteristics, the severity of preeclampsia in previous pregnancies, and the research methodologies employed.

Based on these results, a history of preeclampsia is a factor associated with the occurrence of preeclampsia. Consequently, pregnant women with a history of

preeclampsia require optimized pregnancy monitoring through antenatal care (ANC) services to ensure that the risk of preeclampsia can be detected and managed at an early stage.

Association Between History of Preeclampsia and the Occurrence of Preeclampsia

Based on the study results, among 196 mothers with no history of preeclampsia, 30 respondents (15.3%) developed severe preeclampsia. Meanwhile, among 63 mothers with a history of preeclampsia, 38 respondents (60.3%) developed severe preeclampsia. Chi-Square test results indicated a significant association between a history of preeclampsia and the occurrence of preeclampsia ($p=0.001$). An Odds Ratio (OR) of 8.411 (95% CI: 4.448–15.905) indicates that pregnant women with a history of preeclampsia have 8.411 times the odds of developing severe preeclampsia compared to those without such a history.

These findings align with the theory that a history of preeclampsia is a major risk factor for preeclampsia in subsequent pregnancies. This risk is linked to persistent predispositions, such as impaired placental angiogenesis, endothelial dysfunction, and maternal metabolic factors.⁹ Consequently, ACOG and FIGO recommend low-dose aspirin prophylaxis starting in the first trimester for pregnant women with a history of preeclampsia who meet the indications.⁷ These findings are consistent with Handayani (2025), who reported a sevenfold risk in second pregnancies,¹³ and Takmaz et al. (2021), who reported a recurrence rate of 55.5%, close to the 60.3% found in this study.¹⁴ Variations in recurrence rates across studies (20–60%) are expected due to differences in the severity of preeclampsia during the index pregnancy which are not always detailed in medical records and the potential for under-ascertainment of preeclampsia history if previous pregnancies were managed at other facilities; such under-ascertainment would actually weaken, rather than strengthen, the true OR estimate.

The implication is that every mother with a history of preeclampsia should be identified as high risk from the first antenatal care (ANC) first visit, considered for prophylactic aspirin, and scheduled for more frequent ANC visits.

Association Between Pregnancy Interval and Preeclampsia Incidence

The study results indicate that among 131 pregnant women with a nonrisk pregnancy interval (2–10 years), 15 respondents (11.5%) experienced severe preeclampsia, whereas among 128 pregnant women with a risk pregnancy interval (<2 years or >10 years), 53 respondents (41.4%) experienced severe preeclampsia. Chi-Square test yielded a p -value of 0.001 ($p<0.05$), leading to the conclusion that there is a significant association between pregnancy interval and the incidence of preeclampsia among pregnant women at Grogol Petamburan Community Health Center in 2025. An Odds Ratio (OR) of 5.465 (95% CI: 2.874–10.391) indicates that pregnant women with a risk pregnancy interval have 5.465 times higher odds of developing severe preeclampsia compared to those with a non-risk pregnancy interval.

These findings align with the theory stating that pregnancy intervals that are either too short or too long can increase the risk of preeclampsia. Intervals that are too short are associated with incomplete recovery of the mother's physiological condition and nutritional reserves following the previous pregnancy, while intervals that are too long result in a waning of the immunological and physiological adaptations from the prior pregnancy, thereby increasing the risk of preeclampsia again.⁸

These findings are consistent with the study by Putri (2025), which demonstrated an association between pregnancy interval and the incidence of preeclampsia.¹² These results are also supported by Robillard et al. (2024), who reported that long pregnancy intervals increase the risk of preeclampsia. Differences in findings compared to other studies may be attributed to respondent characteristics, the distribution of interpregnancy intervals, as well as variations in research methods and the characteristics of the study populations. Furthermore, the association between interpregnancy intervals and the occurrence of preeclampsia may also be influenced by other factors such as maternal age and parity that were not analyzed using a multivariate approach in this study.¹⁵

Based on the results of this study, pregnancy spacing is one of the factors associated with the incidence of preeclampsia. Therefore, pregnant women with high-risk pregnancy spacing require optimal pregnancy monitoring through antenatal care (ANC) services so that preeclampsia risk factors can be detected and treated early.

Relationship between ANC Frequency and Preeclampsia Incidence

The study revealed that of 154 pregnant women who attended antenatal care (ANC) visits ≥ 6 times, 13 respondents (8.4%) experienced severe preeclampsia. In the group of pregnant women with ANC visits < 6 times, A total of 45 respondents (50.0%) experienced severe preeclampsia, whereas in the group of pregnant women who had never attended antenatal care (ANC), 10 respondents (66.7%) experienced severe preeclampsia. Chi-Square test results yielded a p-value of 0.001 ($p < 0.05$), thus, it can be concluded that there is a significant association between the frequency of ANC visits and the incidence of preeclampsia among pregnant women at Grogol Petamburan Community Health Center in 2025.

These findings align with the theory that antenatal care (ANC) plays a crucial role in the early detection of risk factors and pregnancy complications. Through routine ANC check-ups, healthcare providers can monitor blood pressure, test for proteinuria, and provide education on pregnancy danger signs, thereby enabling the early identification and management of preeclampsia. Both the WHO and the Ministry of Health of the Republic of Indonesia emphasize the importance of quality ANC services as a means to improve maternal and fetal health during pregnancy.

Findings of this study align with research by Hamzah et al. (2021), which indicates that antenatal care parameters are associated with the incidence of preeclampsia. These results are also supported by various studies stating that pregnant women with an inadequate frequency of antenatal care (ANC) visits face a higher risk of pregnancy complications, including preeclampsia. Variations in results across studies may be attributed to respondent characteristics, access to healthcare services,

maternal adherence to ANC schedules, and differences in research methodologies.⁴

Based on these findings, the frequency of antenatal care (ANC) visits is a factor associated with the incidence of preeclampsia. Therefore, it is essential for pregnant women to attend ANC visits regularly in accordance with established service standards, ensuring that risk factors and signs of preeclampsia can be detected and managed as early as possible.

5. CONCLUSION

1. The frequency distribution of respondent characteristics shows that out of 259 pregnant women, the majority experienced preeclampsia (73.7%). Most respondents fell into the high-risk age group (< 20 years and > 35 years) (54.1%), were multiparous (37.8%), had no history of preeclampsia (75.7%), had a non-risk pregnancy interval (2–10 years) (50.6%), and attended antenatal care (ANC) visits ≥ 6 times (59.5%).
2. There is a significant association between age and the incidence of preeclampsia among pregnant women at Grogol Petamburan Community Health Center in 2025 ($p=0.001$). Pregnant women in the high-risk age group have a higher likelihood of developing severe preeclampsia compared to those in the non-risk age group.
3. There is a significant association between parity and the incidence of preeclampsia among pregnant women at Grogol Petamburan Community Health Center in 2025 ($p=0.001$).
4. There is a significant association between a history of preeclampsia and the incidence of preeclampsia among pregnant women at Grogol Petamburan Community Health Center in 2025 ($p=0.001$). Pregnant women with a history of preeclampsia have a higher likelihood of developing severe preeclampsia compared to those without such a history.
5. There is a significant association between pregnancy interval and the incidence of preeclampsia among pregnant women at Grogol Petamburan Community Health Center in 2025 ($p=0.001$). Pregnant women with a high-risk pregnancy interval have a

higher likelihood of developing severe preeclampsia compared to those with a non-risk pregnancy interval.

6. There is a significant association between the frequency of antenatal care (ANC) visits and the incidence of preeclampsia among pregnant women at Grogol Petamburan Community Health Center in 2025 (p=0.001).

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