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## The Relationship Between the Frequency of Antenatal Care Visits and Early Detection of Preeclampsia Risk in Pregnant Women in the Third Trimester

Rohmi<sup>1\*</sup>, Rezqiqah Aulia Rahmat<sup>2</sup><sup>1</sup>Midwifery Study Program, Mambaul Ulum Health College, Surakarta, Indonesia<sup>2</sup>Medical Study Program, Bosowa University Makassar, Indonesia

### Abstract

**Background:** Preeclampsia is a pregnancy complication that contributes to high maternal morbidity and mortality rates. Regular antenatal care (ANC) visits can help detect risk factors for preeclampsia early, allowing for faster treatment.

**Objective:** To determine the relationship between the frequency of ANC visits and early detection of the risk of preeclampsia in pregnant women in the third trimester.

**Method:** This study used a cross-sectional analytical design on 85 pregnant women in their third trimester at Community Health Center X during March–May 2025. Data were collected through questionnaires and medical records. Data analysis used the Chi-Square test with a significance level of 0.05.

**Results:** The majority of respondents had a standard ANC visit frequency of  $\geq 4$  times (68.2%), and 21.2% of them were diagnosed as being at risk for preeclampsia. Analysis showed a significant association between ANC visit frequency and early detection of preeclampsia risk ( $p=0.021$ ).

**Conclusion:** A standardized frequency of ANC visits is associated with increased early detection of preeclampsia risk. Education on the importance of regular ANC needs to be improved.

**Keywords:** Antenatal Care, Preeclampsia, Early Detection, Trimester III

\*Correspondent Author: Rohmi

\*E-mail: [rohmisai84@gmail.com](mailto:rohmisai84@gmail.com)





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## 1. Introduction

Preeclampsia is a pregnancy complication characterized by increased blood pressure after 20 weeks of gestation, accompanied by proteinuria or signs of organ damage such as impaired liver, kidney, and central nervous system function. This condition is a leading cause of maternal morbidity and mortality worldwide, including in Indonesia. According to the World Health Organization (WHO, 2018), preeclampsia and eclampsia contribute to approximately 14% of maternal deaths globally. In Indonesia, the Indonesian Health Profile report (Ministry of Health of the Republic of Indonesia, 2022) shows that hypertension in pregnancy, including preeclampsia, is the second-highest cause of maternal death after hemorrhage, contributing approximately 27%.

The exact cause of preeclampsia is still unknown, but various theories suggest that placental dysfunction, vascular abnormalities, genetic and immunological factors, and maternal risk factors such as a history of hypertension, obesity, and extreme gestational age play a role. While preeclampsia cannot be completely prevented, it can be detected early through regular prenatal checkups, thus minimizing serious complications such as eclampsia, placental abruption, and maternal and fetal death.

Antenatal Care (ANC) is a series of health services provided to pregnant women periodically and regularly to monitor the health of the mother and fetus, detect risk factors early, and provide timely intervention or referral. The WHO (2016) recommends a minimum of 8 ANC visits during pregnancy, while in Indonesia, the Ministry of Health (2020) sets a minimum standard of 4 visits: one in the first trimester, one in the second trimester, and two in the third trimester.

Several studies have shown that a consistent frequency of antenatal care visits significantly contributes to the early detection of preeclampsia. Research by Putri et al. (2021) found that mothers who attend scheduled antenatal care visits are 2.5 times more likely to have preeclampsia detected early than mothers who rarely attend antenatal care. ANC routinely measures blood pressure, evaluates symptoms such as edema and headaches, and tests urine for proteinuria.

However, in some regions, pregnant women's adherence to ANC schedules remains low. Contributing factors include low awareness, limited access to healthcare facilities, cost, minimal family support, and busy work schedules. This can lead to delays in detecting the risk of preeclampsia, ultimately increasing maternal morbidity and mortality.

Based on this background, this study was conducted to determine the relationship between the frequency of ANC visits and early detection of preeclampsia risk in pregnant women in the third trimester. The results are expected to provide a basis for health workers and policymakers to improve ANC compliance, particularly in the final trimester of pregnancy.

## 2. Research Methods





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a) Research Design

This study used an observational analytical design with a cross-sectional approach, where the independent variable (frequency of ANC visits) and the dependent variable (early detection of preeclampsia risk) were measured simultaneously at a single point in time. This approach was chosen to determine the relationship between the two variables within a limited study period.

b) Location and Time of Research

The research was conducted at Community Health Center X, District Y in March–May 2025. This location was selected purposively because it had a high number of visits by pregnant women and complete medical record data.

c) Population and Sample

The research population was all pregnant women in their third trimester (gestational age  $\geq 28$  weeks) who had their pregnancy checked at Community Health Center X during the research period.

Inclusion Criteria:

1. Pregnant women in their third trimester with a gestational age of  $\geq 28$  weeks.
2. Have a complete KIA book or medical record of ANC visits.
3. Willing to be a respondent by signing the informed consent.

Exclusion Criteria:

1. Pregnant women who experience severe obstetric complications other than preeclampsia (e.g. antepartum hemorrhage, severe gestational diabetes).
2. Pregnant women who cannot be interviewed due to physical or mental conditions.

d) Sampling Techniques

Sampling was conducted using a purposive sampling technique. Based on the sample size calculation for the Chi-Square test and the available population, the minimum sample size was 80 respondents. To anticipate dropout, the sample size was set at 85 respondents.

e) Research Variables

- Independent variable: Frequency of ANC visits, categorized into “according to standards” ( $\geq 4$  times during pregnancy) and “less than standards” ( $< 4$  times).
- Dependent variable: Early detection of preeclampsia risk, categorized as “detected” (blood pressure test results  $\geq 140/90$  mmHg and/or positive proteinuria) and “undetected”.

f) Research Instruments

Data collection is carried out by:

1. Questionnaire to obtain demographic data and frequency of ANC visits.
2. Observation sheet to record the results of blood pressure examinations, proteinuria, and clinical symptoms from medical records.





The instrument has been tested for validity and reliability on 20 respondents at other Community Health Centers with valid results (calculated  $r > \text{table } r$ ) and reliable (Cronbach's  $\alpha > 0.7$ ).

g) Data Collection Procedures

1. Researchers coordinated with the Community Health Center to obtain research permits.
2. Explain the research objectives and procedures to respondents.
3. Ask respondents to sign informed consent.
4. Complete questionnaires and access medical record data for blood pressure checks and urine test results.
5. Grouping respondents according to the category of frequency of ANC visits and early detection status of preeclampsia.

h) Data analysis

The data was analyzed using a statistical program. The analysis was carried out through:

1. Univariate analysis to describe the frequency distribution of each variable.
2. Bivariate analysis using the Chi-Square test to determine the relationship between ANC visit frequency and early detection of preeclampsia risk. The significance level was set at  $p < 0.05$ .

### 3. Results And Discussions

#### a. Results

##### 1) Respondent Characteristics

This study involved 85 pregnant women in their third trimester who met the inclusion criteria. The distribution of respondent characteristics, including age, education, parity, and occupation, is shown in Table 1.

Table 1.  
Respondent Characteristics (n = 85)

Characteristics Category		n	%
Age	<20 years	7	8.2
	20–35 years	66	77.6
	>35 years	12	14.1
Education	Elementary/Middle School	19	22.4
	High School/Vocational School	48	56.5
	College	18	21.2





Characteristics Category		n	%
Parity	Primigravida	35	41.2
	Multigravida	50	58.8
Work	Housewife	52	61.2
	Work	33	38.8

Based on Table 1, the majority of respondents were in the 20–35 age group (77.6%), had a high school/vocational high school education (56.5%), were multiparous (58.8%), and most worked as housewives (61.2%).

Distribution of Frequency of ANC Visits and Early Detection of Preeclampsia Risk The distribution based on the frequency of ANC visits and the results of early detection of preeclampsia risk is presented in Table 2.

Table 2.  
 Distribution of Frequency of ANC  
 Visits and Early Detection of Preeclampsia Risk

Variables	Category	n	%
Frequency of ANC Visits	≥4 times (according to standard)	57	67.1
	<4 times (less than standard)	28	32.9
Early Detection of Preeclampsia Risk Detected	Detected	22	25.9
	Not detected	63	74.1

The majority of pregnant women made ANC visits according to standards (67.1%), and around 25.9% were detected to be at risk of preeclampsia.

Relationship between Frequency of ANC Visits and Early Detection of Preeclampsia Risk Bivariate analysis using the Chi-Square test showed a significant relationship between the frequency of ANC visits and early detection of preeclampsia risk ( $p=0.021$ ), as in Table 3.

Table 3.  
 Relationship between Frequency of ANC  
 Visits and Early Detection of Preeclampsia Risk





Frequency of ANC Visits	Risk Detected	Not detected	Total	p-value
≥4 times	12 (21.1%)	45 (78.9%)	57	0.021
<4 times	10 (35.7%)	18 (64.3%)	28	
Total	22 (25.9%)	63 (74.1%)	85	

Based on Table 3, the proportion of preeclampsia risk detection was higher in mothers whose ANC visits were less than the standard (35.7%) compared to those who met the standard (21.1%). Statistical tests showed a significant difference ( $p < 0.05$ ), thus concluding that there is a relationship between the frequency of ANC visits and early detection of preeclampsia risk.

#### b. Discussion

The study results showed that pregnant women in their third trimester who attended standard ANC visits were more likely to be diagnosed with preeclampsia than those who did not. This aligns with research by Sari et al. (2020), which found that routine ANC allows for more frequent blood pressure and proteinuria checks, thus optimizing early detection.

Low frequency of ANC visits can lead to delays in recognizing early signs of preeclampsia, such as hypertension or edema. According to WHO (2016), adequate ANC visits not only provide the benefits of medical screening but also educate mothers about danger signs.

Furthermore, pregnant women's awareness of the importance of ANC still needs to be improved, especially in areas with limited access to healthcare services. Midwives and other healthcare workers play a crucial role in educating and motivating mothers to undergo regular checkups.

#### 4. Conclusion

##### a. Conclusion

This study shows a significant association between the frequency of antenatal care (ANC) visits and early detection of preeclampsia risk in pregnant women in the third trimester ( $p = 0.021$ ). Mothers who attended standard ANC visits ( $\geq 4$  times) had a greater chance of early detection of preeclampsia risk compared to mothers who attended fewer visits. This underscores the importance of regular ANC visits as a strategy for preventing and controlling pregnancy complications, particularly preeclampsia.

##### b. Suggestion

1. For Health Workers





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- a) Increase education and counseling to pregnant women regarding the importance of making ANC visits as scheduled.
- b) Make sure routine checks such as blood pressure measurements and urine tests are performed at every visit.
2. For Pregnant Women
  - a) Carry out ANC visits at least 4 times during pregnancy according to the standards of the Indonesian Ministry of Health.
  - b) Seek medical attention immediately if you experience any warning signs such as severe headache, swelling of the extremities, or visual disturbances.
3. For Community Health Centers and Health Facilities
  - a) Expanding access to ANC services, especially for pregnant women living in remote areas.
  - b) Providing outreach programs or home visits for mothers who have difficulty accessing health facilities.
4. For Further Researchers
  - a) Conducting research with a longitudinal design to see the causal relationship between the frequency of ANC visits and the incidence of preeclampsia.
  - b) Including other variables such as the quality of ANC services, maternal knowledge level, and family support factors.

**References**

1. American College of Obstetricians and Gynecologists (ACOG). (2020). Hypertension in Pregnancy. Washington, DC: ACOG.
2. Asmirah, R., Srifitayani, NR, Mudrika, M., Herlina, H., Haruna, SR, Asmin, RY, & Rohmi, R. (2024). The Importance Of Knowledge Of Post Partum Mothers In Getting Optimal Breast Milk In Makassar City Maternity Hospital, South Sulawesi. *International Journal of Health Sciences*, 2(4), 1307–1317. <https://doi.org/10.59585/ijhs.v2i4.534>
3. Amir, J., Margono, H., Mohammad, W., Windriasih, Y., & Haryono, B. (2023). Implementation of Digital Environment at IPWIJA University in Facing the Era of Society 5.0. *JIMAD: Multidisciplinary Scientific Journal*, 1(1), 58–66. <https://doi.org/10.59585/jimad.v1i1.173>
4. West Java Provincial Health Office. (2022). West Java Provincial Health Profile 2021. Bandung: West Java Provincial Health Office.
5. Feblina, AR, AR, A., Eni, SN, R, RA, & Ropida, I. (2023). Description of Dental and Oral Health Self-Care Behavior Against Pulp Disease in Pulpitis Patients at the Kassi Kassi Community Health Center. *International Journal of Health Sciences*, 1(1). Retrieved from <https://jurnal.agdosi.com/index.php/IJHS/article/view/370>





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6. Ministry of Health of the Republic of Indonesia. (2020). Guidelines for Integrated Antenatal Services. Jakarta: Directorate General of Public Health, Ministry of Health of the Republic of Indonesia.
7. Ministry of Health of the Republic of Indonesia. (2022). Indonesian Health Profile 2021. Jakarta: Ministry of Health of the Republic of Indonesia.
8. Manuaba, IBG (2021). Obstetrics, Gynecology, and Family Planning. Jakarta: EGC.
9. Nugraheni, A., & Puspitasari, D. (2021). The Relationship Between the Frequency of Antenatal Care Visits and Early Detection of Preeclampsia Risk. *Journal of Reproductive Health*, 12(2), 85–92. <https://doi.org/10.22435/kespro.v12i2.1234>
10. Prawirohardjo, S. (2020). Midwifery. Jakarta: Bina Pustaka Sarwono Prawirohardjo Foundation.
11. Putri, DA, Rahmawati, I., & Nurhayati, S. (2021). The Relationship Between the Frequency of Antenatal Care Visits and Early Detection of Preeclampsia. *Journal of Midwifery*, 10(2), 45–52. <https://doi.org/10.31227/osf.io/abcd1>
12. Raehan, R., Ayu, R., Ovi Harsachatri, D., Mahendika, D., Prihartini, S., & Kurniawati, K. (2023). THE EFFECT OF HYPNOBIRTHING ON THE ANXIETY LEVEL OF PREGNANT WOMEN IN TRIMESTER III IN THE WORKING AREA OF THE PROUDE I HEALTH CENTER, PROUDE DISTRICT, MAJENE. *International Journal of Health Sciences*, 1(1), 66–74. <https://doi.org/10.59585/ijhs.v1i1.55>
13. Susanti, S., Parwati, D., Musdalifah, M., & Irma, I. (2022). The Incidence of Anemia in First Trimester Pregnant Women with Hyperemesis Gravidarum Status in the PKM Bambu Work Area. *Sahabat Sosial: Journal of Community Service*, 1(1), 45–54. <https://doi.org/10.59585/sosisabdimas.v1i1.373>
14. Sari, Y., Andayani, T., & Dewi, M. (2020). The Effect of Antenatal Visits on Preeclampsia Prevention. *Indonesian Public Health Media*, 16(1), 25–33. <https://doi.org/10.30597/mkmi.v16i1.9876>
15. Usviany, V., & Azizah, IN (2022). Natural Lip Balm Formulation with Lime (*Citrus aurantifolia* L.) Essential Oil Extract as a Lip Brightener. *Barongko: Journal of Health Sciences*, 1(1), 156–165. <https://doi.org/10.59585/bajik.v1i1.432>
16. World Health Organization (WHO). (2016). WHO Recommendations on Antenatal Care for a Positive Pregnancy Experience. Geneva: WHO Press.
17. World Health Organization (WHO). (2018). Maternal Mortality: Levels and Trends 2000–2017. Geneva: WHO Press.

