

Maternal Age and Gestational Age in Relation to Anemia among Pregnant Women in Dekai, Yahukimo Regency, Highland Papua

Erna Widyastutik¹, Rosmin M. Tingginehe^{2*}, Samuel Piter Irab³, Dolfinus Yufu Bouway⁴, Arius Togodly⁵, Agus Zainuri⁶

Universitas Cenderawasih

Corresponding Author: Rosmin M. Tingginehe rosemariati16@gamil.com

ARTICLE INFO

Keywords: Anemia, Maternal Age, Gestational Age, Pregnancy, Highland Papua

Received: 5 March

Revised: 25 April

Accepted: 26 May

©2026 Widyastutik, Tingginehe, Irab, Bouway, Togodly, Zainuri: This is an open-access article distributed under the terms of the [Creative Commons Atribusi 4.0 Internasional](https://creativecommons.org/licenses/by-sa/4.0/).



ABSTRACT

Anemia during pregnancy remains a maternal health concern, particularly in remote settings. This study examined the associations of maternal age and gestational age with anemia among pregnant women in the working area of Dekai Health Center, Yahukimo Regency, Highland Papua. An observational analytic study with a cross-sectional design used secondary maternal-register data from January to December 2025. Of 450 registered pregnant women, 306 met the inclusion criteria and were included through total sampling. Data were analyzed using descriptive statistics and Chi-square tests. Anemia was identified in 76.8% of participants. Maternal age below 20 or above 35 years was associated with anemia ($p=0.002$; $PR=1.237$; 95% CI: 1.105–1.385). Gestational age category was also associated with anemia ($p=0.014$; $PR=0.849$; 95% CI: 0.752–0.958). These findings support age-sensitive screening and anemia monitoring throughout pregnancy

INTRODUCTION

Anemia in pregnancy is an important maternal health issue because it can affect the health of pregnant women and their babies. Its occurrence is influenced by multiple factors, including maternal characteristics, nutritional conditions, health-service access, and pregnancy-related changes. In the working area of Dekai Health Center, Yahukimo Regency, the local maternal register recorded a substantial burden of anemia in 2025. Understanding which maternal characteristics are associated with anemia can help health workers identify women who may need closer assessment and follow-up.

Maternal age is a relevant characteristic in pregnancy care. Pregnancy at younger ages and at ages above 35 years is commonly treated as a higher-risk category in maternal health services. The thesis underlying this article classified maternal age below 20 years and above 35 years as the risk group, compared with ages 20–35 years. Previous studies listed in the source thesis have also examined age in relation to anemia during pregnancy, including Riyani et al. (2020) and Tendean et al. (2025).

Gestational age may also be relevant when interpreting anemia because pregnancy progresses through trimesters and maternal physiological demands change over time. The source study categorized the first and third trimesters as the risk group and the second trimester as the comparison group. Studies cited in the thesis, including Qomarasari and Pratiwi (2023) and Tendean et al. (2025), have considered gestational age alongside other factors associated with anemia.

The submitted companion article focuses on ANC visit frequency, nutritional status, and ethnicity. To provide a distinct analysis from the same thesis dataset, this article focuses on two other variables: maternal age and gestational age. The objective was to assess their associations with anemia among pregnant women in the working area of Dekai Health Center in 2025.

THEORETICAL REVIEW

Anemia during pregnancy is assessed using hemoglobin levels recorded during antenatal care. Maternal age can be used to identify groups that may warrant tailored pregnancy monitoring, although age alone does not establish the cause of anemia. Likewise, gestational age provides context for interpreting maternal health indicators across pregnancy. Associations between these characteristics and anemia should be interpreted alongside dietary intake, iron supplementation, infection, access to care, and other factors that may not be available in routine registers.

The source thesis notes that its secondary data did not fully capture several potentially relevant determinants, including socioeconomic conditions, maternal knowledge and education, food intake and dietary patterns, employment, birth spacing, and adherence to iron tablets. Therefore, observed associations in this study are descriptive epidemiological evidence and should not be interpreted as proof of causality.

METHODOLOGY

This observational analytic study used a cross-sectional design in the working area of Dekai Health Center, Yahukimo Regency, Highland Papua Province. Secondary data were drawn from the maternal register for January–December 2025. The register contained 450 pregnant women; 306 met the study inclusion criteria and were analyzed using total sampling.

The outcome was anemia status as recorded in the maternal register and defined according to trimester-specific hemoglobin cutoffs in the source thesis. The two independent variables examined in this article were maternal age and gestational age. Maternal age was categorized as risk (<20 years or >35 years) and non-risk (20–35 years). Gestational age was categorized as risk (first or third trimester) and comparison (second trimester), following the source thesis definitions. Frequencies and proportions were summarized, and associations were tested using the Chi-square test. A p-value below 0.05 was considered statistically significant. Prevalence ratios (PRs) and 95% confidence intervals (CIs) are reported as provided in the thesis analysis.

The source thesis reports ethical approval from the Health Research Ethics Committee, Faculty of Public Health, Universitas Cenderawasih, No. 010/KEPK-FKM UC/2026, issued on 20 February 2026 and valid through 20 February 2027.

RESULTS

Among 306 pregnant women included in the analysis, 235 (76.8%) had anemia and 71 (23.2%) did not. The two variables examined in this article showed statistically significant associations with anemia.

Table 1. Association Between Maternal Age and Anemia Among Pregnant Women (N=306)

Maternal age category	Anemia n (%)	No anemia n (%)	Total n	PR (95% CI)	p-value
Risk (<20 or >35 years)	89 (88.1)	12 (11.9)	101	1.237 (1.105–1.385)	0.002
Non-risk (20–35 years)	146 (71.2)	59 (28.8)	205	Reference	
Total	235 (76.8)	71 (23.2)	306		

Source: Secondary Maternal-Register Data, Processed from the Thesis Dataset (2026)

Anemia was recorded in 88.1% of pregnant women in the risk-age group, compared with 71.2% among women aged 20–35 years. The association was statistically significant (p=0.002), with a PR of 1.237 (95% CI: 1.105–1.385).

Table 2. Association Between Gestational Age Category and Anemia Among Pregnant Women (N=306)

Gestational age category	Anemia n (%)	No anemia n (%)	Total n	PR (95% CI)	p-value
Risk (first or third trimester)	121 (71.2)	49 (28.8)	170	0.849 (0.752–0.958)	0.014
Comparison (second trimester)	114 (83.8)	22 (16.2)	136	Reference	
Total	235 (76.8)	71 (23.2)	306		

Source: Secondary Maternal-Register Data, Processed from the Thesis Dataset (2026)

Anemia was recorded in 71.2% of women in the first- or third-trimester category and 83.8% of women in the second-trimester category. The association was statistically significant ($p=0.014$; $PR=0.849$; 95% CI: 0.752–0.958). Because the reported PR is below 1, the direction of the estimate depends on the category coding and reference group used in the original analysis; the result should not be interpreted as a causal protective effect.

DISCUSSION

The proportion of anemia in this study was high: more than three quarters of the pregnant women in the analyzed register had anemia. This finding indicates the importance of reliable hemoglobin assessment, documentation, follow-up, and timely management during pregnancy in Dekai. Because the study relied on routine secondary records, the estimate describes the included registered women and should not automatically be generalized to all pregnant women in Yahukimo.

Maternal age was associated with anemia. The proportion of anemia was higher among women younger than 20 years or older than 35 years than among women aged 20–35 years. This pattern is consistent with the use of maternal age as a risk-stratification characteristic in pregnancy care. Riyani et al. (2020) examined age and parity in relation to anemia among pregnant women, while Tendean et al. (2025) considered maternal age and gestational age together with iron-tablet adherence. These studies provide relevant context, although differences in setting, definitions, and study methods mean that results should not be assumed to be directly equivalent.

The gestational-age analysis also showed a statistically significant association, but anemia was more prevalent in the second-trimester group than in the combined first- and third-trimester group. The reported PR below 1 reflects the coding and comparison used in the source analysis. This result illustrates why the category definitions and reference group should be made explicit when interpreting prevalence ratios. The cross-sectional design cannot determine whether trimester itself explains the difference. Hemoglobin levels, timing of testing, nutrition, supplementation, and other unmeasured characteristics may also contribute.

For service delivery, maternal age and gestational age can support risk-sensitive assessment but should not replace direct hemoglobin testing or individualized clinical evaluation. Health workers should ensure that anemia screening, counseling, supplementation, and follow-up are delivered in accordance with applicable antenatal-care guidance. Local interpretation should also account for access barriers and the completeness of the maternal register.

These findings complement, rather than duplicate, the companion analysis of ANC visit frequency, nutritional status, and ethnicity. Together, the two analyses highlight different dimensions of the same local problem. However, because both analyses use the same dataset, they should be transparently described as separate variable-focused analyses of one thesis dataset.

CONCLUSIONS AND RECOMMENDATIONS

Maternal age and gestational-age category were significantly associated with anemia among pregnant women recorded at Dekai Health Center during 2025. Anemia was more prevalent among women aged below 20 years or above 35 years. The gestational-age result was statistically significant, but its direction must be interpreted in relation to the original reference category and coding. Health services should maintain hemoglobin screening and follow-up throughout pregnancy, with careful attention to younger and older pregnant women and to women whose records or clinical findings indicate additional needs.

FURTHER STUDY

The cross-sectional design does not establish temporal sequence or causality. The analysis depended on the completeness and accuracy of routine register data and did not fully account for dietary intake, socioeconomic circumstances, education, infection, iron-tablet adherence, or other potential confounders. Future studies should use prospectively collected data, clarify trimester-specific hemoglobin testing and reference categories, and assess whether age and gestational-age associations persist after adjustment for relevant maternal and service-related factors.

ACKNOWLEDGMENT

The authors thank the Faculty of Public Health and the Master of Public Health Study Program, Universitas Cenderawasih, and Dekai Health Center, Yahukimo Regency, for supporting the research. The study was developed from Erna Widyastutik's thesis in the Master of Public Health Study Program, Universitas Cenderawasih.

REFERENCES

- Afni, N., Pratiwi, D., Kodriati, N., Djannah, S. N., Sunarti, & Suryani, D. (2023). Faktor-faktor yang berhubungan dengan kejadian anemia pada ibu hamil di Puskesmas Gamping 1 Kabupaten Sleman tahun 2022. *Jurnal Kedokteran Syiah Kuala*, 23(1), 116–121.
- Andari, I. A., & Yuliawan, D. (2022). Tinjauan literatur anemia kehamilan dan komplikasi terhadap persalinan. Deepublish.
- Qomarasari, D., & Pratiwi, L. (2023). Hubungan umur kehamilan, paritas, status KEK, dan tingkat pendidikan ibu dengan kejadian anemia pada ibu hamil di Klinik El'Mozza Kota Depok. *Jurnal Kesehatan Kusuma Husada*, 14(2), 86–92.
- Riyani, R., Marianna, S., & Yoanita, H. (2020). Hubungan antara usia dan paritas dengan kejadian anemia pada ibu hamil. *Binawan Student Journal*, 2(1), 178–184.
- Tendean, A., Ering, C., & Makasudede, S. (2025). Hubungan usia ibu hamil, usia kehamilan, dan kepatuhan mengkonsumsi tablet Fe dengan kejadian anemia pada ibu hamil. *Jurnal Nutrix*, 9(1), 135–144.
- Widyastutik, E. (2026). Faktor-faktor yang berhubungan dengan kejadian anemia ibu hamil di wilayah kerja Puskesmas Dekai Kabupaten Yahukimo Provinsi Papua Pegunungan [Tesis magister, Universitas Cenderawasih].