PREVALENCE AND RISK FACTOR ANALYSIS OF ANEMIA IN PREGNANCY

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ABSTRACT

Anemia is a condition in which the total amount of iron in the body is reduced. If iron deficiency is severe enough it can cause interference with the reproduction of red blood cells and cause anemia. This condition will cause weakness, become obstacles to activity and will also hinder the growth and development of children. This research aims to describe prevalence of anemia during pregnancy and determine the risk factors that can influence it. This research is included in the analytic descriptive study using a cross-sectional approach design. The target was pregnant women who had an examination at the Hasanah Clinic in September-November 2022. The data were collected by face-to-face interviews and information in medical record. The results showed that 15% of pregnant women had mild anemia and all predicted risk factors did not significantly influence anemia, such as gestational age (p value 0.074), number of gravidity (p value 0.495), and mid-upper arm circumference (p value 1.000). The provision of iron supplements and good nutritional intake can be one of the efforts to prevent and overcome anemia in pregnant women which develops worse.

Keywords: Anemia, risk factors, pregnancy, pregnant women

INTRODUCTION

The state of nutrition during pregnancy is very influential during pregnancy. Poor nutritional status during pregnancy will have an impact on fetal growth. Anemia is a nutritional problem that is often found in pregnant women. [1] According to the Ministry of Health of the Republic of Indonesia, the number of maternal deaths by province in 2018-2019 was reported to have decreased from 4,226 to 4,221 deaths of pregnant women in Indonesia. The main causes of maternal death in 2019 are bleeding (1,280 cases), hypertension in pregnancy (1,066 cases), and infection (207 cases).[2] Based on the data program report for the Province of East Kalimantan, the maternal mortality rate reached 113 based on live births in

20. [3] It's just that efforts and increased cross-sector collaboration are still needed to achieve the 2030 SDG target of less than 70 per 100,000 live births. [3]

Anemia is a condition in which the total amount of iron in the body is reduced. If iron deficiency is severe enough it can interfere with red blood cell production and cause anemia. This condition will cause weakness, become an obstacle to activity and will also hinder the growth and development of children. [4] The harmful effects of anemia on pregnant women during pregnancy can cause miscarriage, premature birth, inhibit the growth and development of the fetus in the womb, easy infection, premature rupture of membranes and bleeding. During delivery the effects of anemia can cause physical activity disturbances which are directly related to postpartum disorders. Pregnant women who experience anemia can affect the baby's condition at birth, such as causing stunting in infants with poor nutritional status, one of which is due to iron deficiency to the formation of hemoglobin concentrations that occur during pregnancy. [5] Anemia in pregnant women can increase the risk of premature birth,

maternal and child mortality, and infectious diseases. The 2018 *Riset Kesehatan Dasar* results show that 48.9% of pregnant women in Indonesia suffer from anemia. Up to 84.6% of cases of anemia in pregnant women occur at the age of 15-24 years. To prevent anemia, every pregnant woman should consume at least 90 iron tablets (additive iron tablets) during pregnancy. [2]

As for several researchers who conducted research on statistically significant risk factors that have a significant relationship with the incidence of anemia in pregnant women. Stephen's research in Ethiopia shows that women with low incomes are more at risk of developing anemia than women with high incomes. [6] Amalia's research found that 97% of the incidence of anemia in pregnant women was influenced by age, parity, and education. Parity was the most dominant factor. [7] Apriliana's research showed that parity, distance between pregnancies, occupation, income, adherence to iron supplement consumption during pregnancy and frequency of prenatal check-ups were factors in the incidence of anemia in third trimester pregnant women. [8] Some of these studies show that there are several

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factors that are a risk factor for anemia, namely maternal age, gestational age, nutritional status, level of adherence to consuming iron (Fe) tablets, parity, and education.

Many research findings have revealed that the determinants of anemia differ from place to place. Judging from the importance of determining problem-based factors associated with the incidence of anemia using a robust study design to obtain local data in at-risk areas. Based on this background, researchers are interested in conducting this research.

MATERIAL AND METHOD

The type of research design used was a cross sectional study. This research was conducted in September – November 2022, in the working area of the Samarinda Hasanah Clinic involving 78 pregnant women who met the sample criteria. The sampling procedure was carried out using a random sampling system procedure in which the sample criteria in this study were pregnant women who had their hemoglobin (Hb) levels checked. A pregnant woman considered anemic if Hb was < 11 g/dl. Severity of anemia was measured as follows: mild (Hb 9.0 – 10.9 g/dl), moderate (Hb 7.0 – 8.9 g/dl), and severe (Hb < 7.0 g/dl). The data were collected by face-to-face interviews and information in medical record. The data obtained was analyzed through SPSS ver. 24 with Chi-Square test. The Odds Ratio (OR) with 95% Confidence Interval (CI) was used to measure the strength of association between anemia and risk factors associated obstetric and medical history (gestational age, number of gravidity, and mid-upper arm circumference).

RESULT

This research was conducted in September - November 2022 at the Hasanah Clinic in Samarinda with a total sample of 78 people. Based on the research conducted, the results are as follows.

Table 1. Socio-demographic Characteristics

Variable	Total (n = 78)	Percentage (%)
Age in years		

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15 – 19	7	9.0
20 – 29	43	55.1
30 – 39	26	33.3
≥ 40	2	2.6
Mean (±SD)	27.9 (±6.5)	
Educational status		
Primary school	7	9.0
Secondary school	59	75.6
Above secondary school	12	15.4

Based on the results in table 1, the mean age (±standard deviation, SD) of the pregnant women was 27.9 (±6.5), most of which were in the age category 20 – 29 years (55.1%). Educational status shows that the pregnant women have various educational backgrounds, the most recent education being secondary school, and those with the above secondary school having a bachelor's degree. In this study, it was found that 15% of respondents had anemia, all of whom had mild anemia, no respondents had moderate or severe anemia. As many as 85% of respondents did not experience anemia at the time of examination (figure 1). The mean Hb level (±SD) was 11.97 (±1.11).
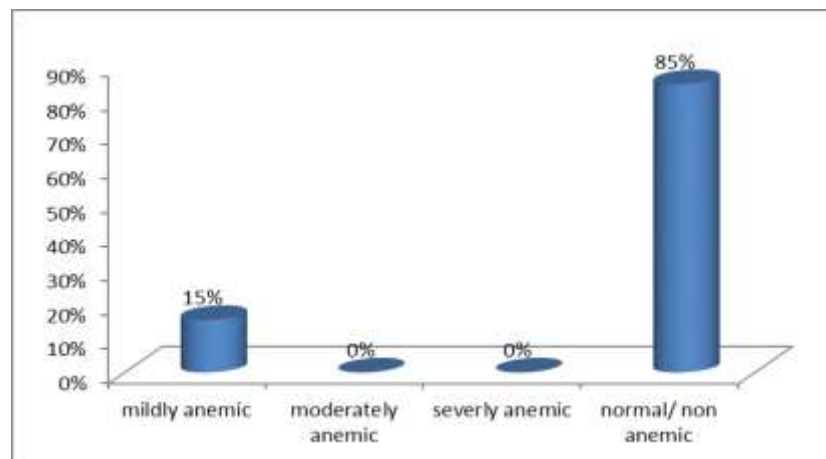

Figure 1. Prevalance of Anemia

Bivariate analysis used to determine the relationship between factors and anemia that showed in table 2. All factors analyzed did not show a significant effect on the incidence of anemia, but it can be seen that respondents with gestational age in 3rd trimester (≥ 28 weeks) and multigravida

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experienced anemia more than respondents with 1st – 2nd trimester of gestation and primigravida.

Table 2. Factors Associated with Anemia

Variable	Frequency (%)	Anemia		OR (95% CI)	p value
		Yes (n)	No (n)		
Gestational age in weeks					
< 28	38 (48.7)	3	35	3.387 (0.841-13.642)	0.074
≥ 28	40 (51.3)	9	31		
Mid-upper arm circumference					
< 23 cm	4 (5.1)	1	3		0.495
≥ 23 cm	74 (94.9)	11	63	0.524 (0.050-5.504)	
Number of gravidity					
Primigravida	25 (32.1)	4	21		1.000
Multigravida	53 (67.9)	8	45		
				0.933 (0.253-3.450)	

DISCUSSION

The study findings showed that prevalence of anemia during pregnancy in one of antenatal care in Samarinda was 15%. The prevalence of anemia in this clinic was lower compared to 43.9% as reported by Fathoni and colleagues (2021) who collected their data in another health care in Samarinda. It can be caused by the uneven incidence of anemia in each region and that previous research was carried out in areas that have the highest incidence of anemia in Samarinda. However, the severity of anemia found in this study was similar, most of pregnant women who visited the clinic did not experience anemia and there were no pregnant women with severe anemia. The existence of the government program that requires pregnant women to consume iron tablets at least 90 tablets during pregnancy have proven to be effective in preventing severe anemia. [9] In the data mentioned by Samarinda Health Office in 2016 – 2020, it was found that more than 80% of pregnant women had received iron tablets. [10]

Anemia has multiple causes, and the associated risk factors vary widely across populations and communities. The current study identified three predictors of anemia among pregnant women, such as gestational age, number of gravidity, and mid-upper arm circumference. All of these factors did not show significant results in influencing the incidence of

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anemia, which is not theoretically appropriate.

This study indicates that gestational age does not have a significant relationship with anemia, this result is similar to studies conducted by Budiana and colleagues and Derso and collegues. [11] [12] This can be caused by various factors that can prevent anemia even though the need for iron during pregnancy continues to increasing according to gestational age.[13] Apart from iron supplements, pregnant women can also meet their iron needs from food intake. The dietary intake during pregnancy looks significant with the presence of anemia in pregnant women which has been observed by Osman and collegues (2020). The odds of developing anemia were significantly higher in pregnant women who consumed red meat 1 – 2 time a month or not at all, in comparison to pregnant women who consumed it every day. Red meat is rich in iron that enhances the hemoglobin level, especially during pregnancy where iron demand is high.[14]

Good nutrition in pregnant women can be shown in the value of mid-upper arm circumference (MUAC). In this study, 94.9% of pregnant women had normal MUAC ($\geq$ 23 cm). MUAC is a measure widely used for the assessment of nutritional status, and 23 cm is the threshold circumference considered to determine the level of nourishment of an adult female, and circumferences less than this signifying undernourishment.

Nutritional deficiencies not only result in anemia but can also have a negative impact in late pregnancy, because women are not able to meet with the demand from the growing fetus, resulting in harm to the mother and ultimately loss of the fetus. [14]

Another factor that is also predicted to have a relationship with anemia is the number of gravidity.

Based on the results of this study, it was found that 67.9% of pregnant women were in the multigravida category (more than one pregnancy). Although the results shown do not have a significant relationship, it appears that multigravida pregnant women are more anemic than primigravida pregnant women. In previous studies it was stated that the more often the mother gave birth, the higher the risk of anemia. This is because the iron reserves of pregnant women have not recovered, eventually being depleted

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for the needs of the fetus they are carrying. Women need more iron than men because menstruation occurs with heavy bleeding. In addition, pregnancy requires additional iron to increase the number of red blood cells and form fetal red blood cells and the placenta. [15]

CONCLUSION

Based on data analysis from the 78 samples studied, it was found that 15% pregnant women experienced anemia and another 85% did not anemic at Hasanah Clinic Samarinda. All of the incidence anemia were mild anemic. Factors associated obstetric history (gestational age, number gravidity, and MUAC) did not significant relationship with the incidence of anemia in pregnant women. Further research needs to involve a wider range of risk factors in order to detect factors that can independently influence anemia in pregnancy.

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REFERENCES

1. Tanziha, I., Utama, L. J. & Rosmiati, R. Faktor Risiko Anemia Ibu Hamil Di Indonesia. *J. Gizi dan Pangan* **11**, 143–152 (2016).
2. KEMENKES RI. *Profil Kesehatan Indonesia Tahun 2019*. (Kementerian Kesehatan Republik Indonesia, 2020).
3. Alvaro, R., Christianigrum, R. & Riyono, T. *Ringkasan Eksekutif : Dak Fisik Bidang Kesehatan Dalam Mendukung Target Penurunan Angka Kematian Ibu dan AnaK*. (Pusat Kajian Anggaran Badan Keahlian DPR RI, 2021).
4. Fitriany, J. & Saputri, A. I. Anemia Defisiensi Besi. *J. Averrous* **4**, 1–14 (2018).
5. Tampubolon, R., Panuntun, B. & Lasamahu, J. F. Identifikasi Faktor-Faktor Kejadian Anemia pada Ibu Hamil di Kecamatan Amahai Kabupaten Maluku Tengah. *J. Sains dan Kesehat.* **3**, 489–506 (2021).
6. Stephen, G. *et al.* Anaemia in Pregnancy: Prevalence, Risk Factors, and Adverse Perinatal Outcomes in Northern Tanzania. *Anemia* **2018**, 1–9 (2018).
7. Amallia, S., Afriyani, R. & Utami, S. P. Faktor Risiko Kejadian Anemia pada Ibu Hamil di Rumah Sakit BARI Palembang. *J. Kesehat.* **8**, 389–395 (2017).
8. Apriliana, M., Tampubolon, R. & Mangalik, G. Faktor Determinan Kejadian Anemia Pada Ibu Hamil Trimester III. *J. Ilm. Ilmu Kesehat.*

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10, 86–100 (2022).

9. Fathoni, I., Hasanah, N. & Fransiska, N. *Kepatuhan Mengkonsumsi Tablet Fe Dan Status Gizi Berhubungan Dengan Kejadian Anemia Pada Ibu Hamil Di Puskesmas Lempake Kota Samarinda*. (2021).

10. DINKES,K. Data Upaya Kesehatan Provinsi Kaltim Tahun 2016-2020. *Dinas Kesehatan Prov. Kaltim* https://data.kaltimprov.go.id/dataset/data-upaya-kesehatan-provinsi-kaltim-tahun-2016-2020 (2022).

11. Budiana, T. A., Ahmad, N. & Melan, C. Aspek-Aspek yang Berhubungan dengan Kejadian Anemia pada Ibu Hamil di Puskesmas Cigugur Tengah. *J. Kesehat. Masy.* **12**, 164–171 (2022).

12. Derso, T., Abera, Z. & Tariku, A. Magnitude and associated factors of anemia among pregnant women in Dera District: A cross-sectional study in northwest Ethiopia. *BMC Res. Notes* **10**, 1–8 (2017).

13. Amini, A., Pamungkas, C. E. & Harahap, A. P. H. P. Usia Ibu Dan Paritas Sebagai Faktor Risiko Yang Mempengaruhi Kejadian Anemia Pada Ibu Hamil Di Wilayah Kerja Puskesmas Ampenan. *Midwifery J.* **3**, 108–113 (2018).

14. Osman, M. O. *et al.* Risk Factors for Anemia Among Pregnant Women Attending the Antenatal Care Unit in Selected Jigjiga Public Health Facilities, Somali Region, East Ethiopia 2019: Unmatched Case–Control Study. *J. Multidiscip. Healthc.* **Volume 13**, 769–777 (2020).

15. Harna, Muliani, E. Y., Sa'pang, M., Dewanti, L. P. & Irawan, A. M. A. Prevalensi Dan Determinan Kejadian Anemia Ibu Hamil. *JIK (Jurnal Ilmu Kesehatan)* **4**, 78–83 (2020).

Correspondence : Rizki Nur Azmi. Faculty of Public Health, Study Program of Pharmacy, Faculty of Pharmacy, Universitas Muhammadiyah Kalimantan Timur, Samarinda, Kalimantan Timur, Indonesia. Wulandaree2806@gmail.com