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PREVALENCE AND RISK FACTORS FOR ANEMIA IN PREGNANT WOMEN AT JARAGA SASAMEH HOSPITAL

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ABSTRACT
Information about incidence and risk factor for anemia is needed to help women avoid unwanted pregnancy outcome such as possibility of bleeding during labor and worse baby outcomes. The lack of data regarding the incidence of anemia in pregnant women in Barito Selatan Regency is still a major problem. The study was to describe the prevalence cases and to analyze the risk factor that cause anemia in pregnancy. The research method was analytic with a cross sectional design. The total sample of 235 pregnant women. Descriptive data analysis was presented in the distribution table and Chi-Square statistical test using SPSS version 26. The results showed anemia occurred in 164 of 235 respondents (69.8%). There was no significant relationship between number of pregnancies on the incidence of anemia ($p>0.05$). There was a significant relationship between maternal age, patient education, nutritional status, employment status, consumption of Fe, consumption of vitamin C and complication of pregnancy with the incidence of anemia ($p<0.05$). The conclusion of the study was that the factors associated with the incidence of anemia in pregnant women at Jaraga Sasameh Hospital were patient education, nutritional status, consumption of Fe, consumption of vitamin c and complication of pregnancy

INTRODUCTION

One of the SDGs targets is to reduce maternal mortality, one of the causes of which is the prevalence of anemia in pregnant women which is still high at 41.8% in the world and 48.2% in Asia with a mortality rate of 4%.1,2 The Riskesdas report shows that the prevalence of anemia in pregnant women in Indonesia increased in 2018 to 48.9%.3 Data from the Central Kalimantan Provincial Health Office (2016), anemia in pregnant women in Central Kalimantan Province in 2016 was 1,017 (3.10%) out of 31,502 pregnant women.4

Many medical centers define anemia in pregnant women when the Hb value is lower than 10.5 g/dL compared to the reference range of 14 g/dL in non-pregnant patients.5,6 In a normal pregnancy, the plasma volume increases more, leading to relative anemia.5,7 This results in physiological decreases in hemoglobin (Hb) levels, hematocrit values (Hct), and red blood cell counts, but had no effect on mean corpuscular volume (MCV).7,8 In the pregnant population, anemia is defined as hemoglobin levels of less than 11 g/dL in the first trimester, less than 10.5 g/dL in the second trimester and less than 11 g/dL in the third and postpartum trimesters (Eweis *et al.*, 2021).

In its latest guidelines on anemia in pregnancy, the American College of Obstetricians and Gynecologists eliminated different hemoglobin level thresholds to determine iron deficiency anemia in pregnant people are black and white.11,12

The most common cause of anemia in pregnant women is iron anemia, which is a micronutrient problem that is a lack of iron reserves.11,13 Iron deficiency anemia accounts for 75-95% of anemia cases in pregnant women.13 Iron deficiency anemia can be caused by many factors, such as inadequate nutrient intake (malnutrition, low socioeconomic, vegetarian, chronic disease), malabsorption (celiac disease and atrophic gastritis) and chronic chronic loss (esophageal varicose veins, hiatus hernia, peptic ulcer, IBS, worm infestation, hemorrhoids and menorragia.15,16,17 Pregnant women are recommended to supplement their diet with 60 mg of elemental iron daily.18

Chronic iron deficiency in pregnant women can cause symptoms in the mother and fetus. (2022) Anemia in the mother can cause impaired physical performance, difficulty breathing, fatigue, palpitations, difficulty sleeping, decreased cognitive and behavioral performance and postpartum depression.6,17,19 Anemia in pregnancy is associated with an increased risk of preeclampsia, postpartum hemorrhage, infection, and length of hospitalization.21,22,23

Iron deficiency anemia can cause stunted fetal growth, low birth weight, premature birth in the fetus born, perinatal death and postpartum depression, can even cause deficits in infants up to three months of early life.24,25,26Iron is also beneficial for metabolism and nerve function so that children born with iron deficiency are at risk of cognitive difficulties, social-emotional, adaptive function, and motor development.27,28,29,30,31 Other studies suggest that iron deficiency anemia diagnosed at 30 weeks gestation or earlier increases the risk of autism spectrum disorder, attention deficit/hyperactivity disorder, and intellectual disability in children.32,33

Factors that influence the incidence of anemia in pregnant women are basic factors (socioeconomic, knowledge, educational, and cultural), indirect factors (antenatal visits, parity, age, and husband support), direct factors (iron tablet consumption patterns, infectious diseases, and bleeding).34,35 Research conducted by (2017) states that there is a relationship between age (ρ-value = 0.032) and parity of pregnant women (ρ- value = 0.005) with the incidence of anemia.36 Research that Others say that there is a significant relationship between nutritional status and the incidence of anemia in pregnant women. 37 Based on the description above, the author is interested in making a study on the prevalence and risk factors of anemia in pregnant women at the Jaraga Sasameh Regional General Hospital (RSUD).

RESEARCH METHODS

This research is an analytical survey research with a cross sectional design, namely causal variables or cases that occur in the object of research measured or collected simultaneously. The population of this study was the total sampling (all pregnant women) who carried out pregnancy checks in the Comprehensive Emergency Neonatal Obstetrics Service Room (PONEK) Jaraga Sasameh Hospital, totaling 235 pregnant women. The research instrument used the results of routine

blood laboratory tests and patient data taken secondarily from the patient's medical record from January 2022 to June 2022. Some of the inclusion criteria for sample determination are 1) Pregnant women who check their womb; 2) Healthy (not suffering from secondary infections) based on the results of a doctor's examination; 3) There is no acute bleeding disease. The variables tested include maternal age, number of pregnancies (gravida) of the mother, maternal education, nutritional status, employment status, iron consumption, consumption of vitamin C and complicating pregnancy against the incidence of anemia. The analysis used a bivariate statistical test, namely chi square with a confidence value of 95% and a meaning value of $p<0.05$ to see the relationship between the dependent variable and the independent variable, also determined the Odds ratio and Spearmann Correlation using the SPSS application version 26.

RESULTS AND DISCUSSION

Characteristics of Respondents

The prevalence of anemia of pregnant women in the PONED room of Jaraga Sasameh Hospital is 69.8% (164 people), the prevalence is above the national prevalence (48.9%).

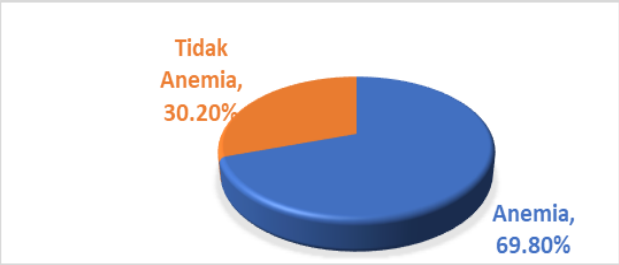

Figure 1 Prevalence of Anemia of Pregnant Women in the PONED Room of Jaraga Sasameh Hospital

The distribution of respondents based on characteristics is shown in Table 1.

Table 1 Characteristics of Respondents

Primigravida	82	34.9
Multigravida	136	57.9
Grandemultipara	17	7.2
Education		
SD	7	3.0
SMP	42	17.9
SMA	74	31.5
D3/D4	70	29.8
S1	42	17.9
Employment Status		
Does not work	146	62.1
Work	89	37.9
Status Gizi/IMT		
Less	41	17.4

Enough	178	75.7
Overweight	16	6.8
Iron Consumption		
No consumption	67	28.5
Consumption	168	71.5
Konsumsi Vitamin C		
No consumption	162	68.9
Consumption	73	31.1
Pregnancy complicators		
None	27	11.5
Exist	208	88.5

Based on the distribution of characteristics in table 1, the age of respondents is most at the optimal age, namely 20-34 years (66%) and at least under 20 years (8.9%). Based on the number of pregnancies, respondents were most in the multigravida category (2nd to 4th pregnancy) (57.9%) followed by primigravida (first pregnancy) (34.9%). Based on education level, the most respondents with high school education level (31.5%) followed by D3/D4 education (29.8%). Based on nutritional status according to BMI measurements, the most respondents with normal nutritional status (75.7%) were obtained.

Based on iron consumption, respondents mostly consumed iron by 68.9%. Based on vitamin C consumption, respondents mostly did not consume vitamin C (68.9%). Based on the presence of complicators in pregnancy, respondents had the most complicating in pregnancy (88.5%) in the form of preeclampsia, hepatitis B, placenta previa and fetal distress.

Determinants of the Incidence of Anemia in Pregnant Women

The relationship between maternal age and the incidence of anemia

Table 2. The relationship between maternal age and events

Age	Incidence of Anemia				*p*	*OR*	*Korelasi*
	Anemia		No				
	n	%	n	%			
< 20 thn	20	8.51	1	0.42	0.028	0.080	**.115**
20-34 thn	105	44.68	50	21.27			
> 35 thn	39	16.59	20	8.51			
Sum	**164**	**69.78**	**71**	**30.22**			

Based on table 2 above, it is known that from 235 mothers who have a risk age and experience anemia as many as 59 respondents (25%). From the Chi-Square statistical test, a p-value of 0.028 < 0.05 was obtained, which means that there is a relationship between maternal age and the incidence of anemia. The value of OR = 0.080, means that pregnant women who have an age at risk have a chance of 0.080 times anemia compared to pregnant women who have an age not at risk. The correlation results of Spearman = 0.115 show that there is a very weak and unidirectional significant relationship between maternal age and the incidence of anemia. The results of this study are in line with Astriana's research (2017) on the relationship between the incidence of anemia in pregnant women in the working

area of the Cold Water Health Center in Padang City with the results that there is a relationship between maternal age and the incidence of anemia p value 0.000 (<0.05; OR=0.597).38 Research conducted by Ammalia et al (2018) also concluded that the high-risk age in pregnant women has a 2 times greater and statistically significant tendency (p = 0.03) to experience anemia than pregnant women with at-risk age. low.36 Another study explained that pregnant women aged <20 years and >35 years have a risk of 1.8 times anemia compared to those who are not at risk (20-35 years).39 In a study conducted by SL et al., (2019) that the age of pregnant women <25 years can increase the incidence of anemia by 2 times and statistically significant (p = 0.04) compared to the age of >25 years.40

At < 20 years of age, the reproductive organs are not mature enough to perform their functions and the hormonal system is still labile compared to > 20 years of age, with the unstable hormonal system prone to anemia.2,3 Anemia in pregnant women aged <20 years, possibly in adolescence or before pregnancy also has iron deficiency so that it continues throughout pregnancy.38 Thus, Pregnant women aged <20 years need more additional nutrients than 20-35 years old because in addition to being used for themselves, they also have to share with their fetus to grow and develop, while pregnant women aged > 35 years also need large amounts of nutrients because their organ function weakens.2,4,22

Table 3. The relationship of maternal gravida with the incidence of anemia

Gravida	Incidence of Anemia				*p*
	Anemia		No		
	n	%	n	%	
First	61	25.95	21	8.93	**0.560**
Multi	91	38.72	45	19.14	
Grandemulti	12	5.10	5	2.12	
Jumlah	**164**	**69.78**	**71**	**30.22**	

Based on table 3 above, it is known that from 235 mothers who have gravida at risk and have anemia as many as 12 respondents (5.10%). From the Chi-Square statistical test, the p-value results were obtained 0.560 > 0.05 which means there is no significant relationship between maternal gravida and the incidence of anemia. The results of the study are in line with Sri Yunita's (2017) research on factors related to the incidence of anemia in third trimester pregnant women at the Umbulharo II Health Center which showed no relationship between maternal gravida and the incidence of anemia of pregnant women (p value 1,000).41

The relationship between maternal employment status and the incidence of anemia

Table 4. The relationship between mother's employment status and Incidence of Anemia

Status	Incidence of Anemia				*p*	*OR*	*Korelasi*
	Anemia		No				
	n	%	n	%			
Work	125	53.19	21	8.93	0.000	7.63	**.442**

Not Working	39	16.59	50	21.27
Sum	**164**	**69.78**	**71**	**30.22**

Based on table 4 above, it is known that from 235 working and anemic mothers as many as 125 respondents (53.19%). From the Chi-Square statistical test, a p-value of 0.000 < 0.05 was obtained, which means that there is a relationship between maternal work and the incidence of anemia. The value of OR = 7.63, means that pregnant women who have a job have a 7.63 times chance of anemia compared to pregnant women who do not have a job. The results of the Spearman.442 correlation show that there is a significant and unidirectional relationship between maternal education and the incidence of anemia. The results of the study are in line with research conducted by (Amalia, Surya and Syahputra, 2017) on perceptions related to the incidence of anemia in pregnant women in the working area of the Pandanaran Semarang Health Center, which states that there is a relationship between work and the incidence of anemia in pregnant women (p value 0.032; OR 8,067).42

The relationship between maternal education and the incidence of anemia

Table 5. The relationship between maternal education and the incidence of anemia

Education	Incidence of Anemia				*p*	*OR*	*Korelasi*
	Anemia		No				
	n	%	n	%			
SD	6	2.55	1	0.42	0.000	0.345	**.556**
SMP	40	17.02	2	0.85			
SMA	64	27.23	10	4.25			
D3/D4	51	21.70	19	8.08			
S1	3	1.27	39	16.59			
Sum	**164**	**69.78**	**71**	**30.22**			

Based on table 5 above, it is known that from 235 mothers who had low education and had anemia as many as 107 respondents (46.8%). From the Chi-Square statistical test, a p-value of 0.000 < 0.05 was obtained, which means that there is a relationship between maternal education and the incidence of anemia. The value of OR = 0.345, means that pregnant women who have low education have a chance of 0.345 times anemia compared to pregnant women who have good education. The results of the Spearman correlation .556 show that there is a strong and unidirectional significant relationship between maternal education and the incidence of anemia. Highly educated pregnant women can choose foods that contain lots of iron.44 Lack of information is also an obstacle to healthy lifestyle changes, they prefer advice from ancestors who are considered better and ignore the advice of health workers, one of which is the habit of drinking milk that is thought to cause large babies.44 The purpose of education is to change behavior, because according to (2018) Education is one of the factors that influence the formation of a person's behavior, these behaviors and actions are formed through a series of learning processes and are expected to last a long time and remain based on awareness.36

The results of the study conducted are in line with research conducted by (2021), the level of education is associated with the incidence of anemia of pregnant women with (p value 0.033).43 Other studies are (2019) similar to research conducted (Prahesti, Indarto and Akhyar, 2016) where education in pregnant women can increase the risk of anemia by 2 times and statistically meaningful (p = 0.02).40,44 Furthermore, research conducted by (2016) shows that education low (elementary and junior high school) have an 11-fold risk of anemia and statistically significant (p value 0.002) and research (Ullah *et al.*, 2018) which is statistically significant (p value 0.01) and (Purba, Tamba and Saragih, 2018) statistically significant (p value 0.002) states that there is a significant relationship between maternal education and the incidence of anemia.45,46,47

The relationship between maternal nutritional status / BMI with the incidence of anemia

Table 6. The relationship between maternal nutritional status / BMI with the incidence of anemia

Gizi	Incidence of Anemia				*p*	*OR*	*Korelasi*
	Anemia		No				
	n	%	n	%			
Less	39	16.59	2	0.85	0.000	0.33	**.140**
Good	110	46.80	68	28.93			
More	15	6.38	1	0.42			
Sum	**164**	**69.78**	**71**	**30.22**			

Based on table 6 above, it is known that from 235 mothers who have nutritional status at risk and have anemia as many as 54 respondents (22.97%). From the Chi-Square statistical test, a p-value of 0.000 < 0.05 was obtained, which means that there is a relationship between maternal nutritional status and the incidence of anemia. The value of OR = 0.33, means that pregnant women who have nutritional status are at risk have a chance of anemia as much as 0.33 times compared to pregnant women who have adequate nutritional status. The correlation results of Spearman = 0.140 showed that there was a very weak and unidirectional significant relationship between maternal nutritional status and the incidence of anemia.

The results of the above study are in accordance with the theoretical concept, malnutrition due to lack of iron and protein intake from food, impaired absorption in the intestine, acute and chronic bleeding, and increased need for iron as in pregnant women can cause anemia and poor outcomes in infants (IUGR, asphyxia, anemia in neonate).48,49,50,51 Pregnant women who experience SEZ have a 3-fold risk of anemia.37, 52 The results of the study conducted are in line with research conducted by (Christianti, Anwar and Dwiriani, 2019) that there is a significant positive relationship between maternal nutritional status before pregnancy and anemia status.53

Association of iron consumption with the incidence of anemia

Table 7. Association of iron consumption with the incidence of anemia

Iron	Incidence of Anemia				*p*	*OR*	*Korelasi*
	Anemia		No				
	n	%	n	%			
Consumption	98	41.70	70	29.78	0.00	44.8	**.395**

No Consumption	66	28.08	1	0.42
Sum	**164**	**69.78**	**71**	**30.22**

Based on table 7 above, it is known from 235 mothers who consumed iron and experienced anemia as many as 98 respondents (41.70%). From the Chi-Square statistical test, a p-value of 0.000 < 0.05 was obtained, which means that there is a relationship between maternal nutritional status and the incidence of anemia. The value of OR = 47.8, means that pregnant women who do not consume iron have a 47.8 times chance of anemia compared to pregnant women who consume iron. The results of the Spearman correlation = 0.395 show that there is a moderate and unidirectional significant relationship between iron consumption in mothers and the incidence of anemia.

The results of this study are in line with research conducted by (2012) showing there is a relationship between adherence to iron tablet consumption with the incidence of anemia in pregnant women with a p value of 0.05.54 Other studies say that pregnant women who do not comply with taking iron tablets will increase the risk of anemia by 7 times compared to pregnant women who are obedient to taking iron tablets.55 Lack of intake of iron tablets is at fourfold risk anemic and statistically significant (p = 0.003; 0.01).56 Research is reinforced by Lebso (2019) that pregnant women who do not consume iron tablets 2 times have a risk of up to 6 times pregnancy anemia which is explained that pregnant women need to consume iron tablets during pregnancy, because the iron needs of pregnant women increase during pregnancy.57

The relationship of vitamin C consumption with the incidence of anemia

Table 8. The relationship of vitamin C consumption with the incidence of anemia

Vit C	Incidence of Anemia				*p*	*OR*	*Korelasi*
	Anemia		No				
	n	%	n	%			
Consumption	6	2.55	67	28.51	0.000	44.1	**.900**
No Consumption	158	67.23	4	1.70			
Sum	**164**	**69.78**	**71**	**30.22**			

Based on table 8 above, it is known from 235 mothers who did not consume vitamin C and experienced anemia as many as 158 respondents (67.23%). From the Chi-Square statistical test, a p-value of 0.000 < 0.05 was obtained, which means that there is a relationship between maternal nutritional status and the incidence of anemia. The value of OR = 44.1, means that pregnant women who do not consume vitamin C have a chance of anemia as much as 44.1 times compared to pregnant women who consume vitamin C. The results of the Spearman = 0.900 correlation show that there is a very strong and unidirectional significant relationship between vitamin C consumption in mothers and the incidence of anemia.

The results of the study are in line with the results of research conducted by (Agusmayanti, Farich and Anggraini, 2020) which stated that there was a significant influence between the administration of vitamin C on increasing Hb levels in pregnant women (p value 0.0003 < 0.05) on the administration of vitamin c 50mg / day.58 Another study conducted by (Marlenywati, Hariyadi and Ichtiyati, 2015) stated that there was a significant increase from the beginning and end of the hemoglobin test (0.63 g / dl) in pregnant women who consumed vitamin C compared to with pregnant women who do not consume (p value 0.032 <0.05).59

The relationship of complicating pregnancy with the incidence of anemia

Table 9. The relationship of complicating pregnancy with the incidence of anemia

Encryption	Incidence of Anemia				*p*	*OR*	*Korelasi*
	Anemia		No				
	n	%	n	%			
Exist	164	69.78	44	18.72	0.000	0.995	**.548**
No Have	0	0	27	11.48			
Sum	**164**	**69.78**	**71**	**30.22**			

Based on table 9 above, it is known that from 235 mothers who have complications in pregnancy and have anemia as many as 164 respondents (69.78%). From the Chi-Square statistical test, the p-value results are 0.000 < 0.05 which means there is a relationship between complicating pregnancy and the incidence of anemia. The value of OR=995, means that pregnant women who have pregnancy complicates have a chance of anemia as much as 0.99 times compared to pregnant women who do not have complications in pregnancy. The results of the Spearman correlation of 0.548 show that there is a strong and unidirectional significant relationship between the presence of complicators in mothers and the incidence of anemia.

The results of the study conducted in line with research conducted by (Sari and Prahesti, 2017) stated that complicating during pregnancy in the form of clinical diseases currently predisposes pregnant women to anemia (p value 0.042 < 0.05).44 Other studies say that there is a risk of 0.31 to 6 times in pregnant women with complications in pregnancy experiencing anemia compared to pregnant women who do not have complications.60

CONCLUSION

Based on the results of research conducted in the PONED Room of Jaraga Sasameh General Hospital on pregnant women about the Prevalence and Risk Factors of Anemia in Pregnant Women at Jaraga Sasameh General Hospital in 2022, the following conclusions were obtained: 1) The prevalence of anemia in pregnant women visits was 164 mothers (69.4%). 2) The highest maternal age at the age of 20 to 34 years is 155 mothers (66%). 3) The most maternal gravida in multigravida pregnancies was 136 mothers (57.9%). 4) The most maternal education in high school education is 74 mothers (66%). 5) The most employment status of non-working mothers is 146 mothers (62.1%). 6) Maternal nutritional status has the most good nutritional status as many as 178 mothers (66%). 7) Maternal iron consumption was

highest in iron consumption as many as 168 mothers (71.5%). 8) The most consumption of vitamin C is not drinking as much as 162 mothers (68.9%). 9) Most mothers have complications in pregnancy as many as 208 mothers (88.5%). 10) There was no significant association between maternal gravida and the incidence of anemia (p value 0.560). 11) There was a very weak and unidirectional significant association between maternal age and the incidence of anemia (p value 0.028; OR 0.080; Friedmann .115). 12) There is a strong and unidirectional significant relationship between maternal education and the incidence of anemia (p value 0.000; OR 0.345; Friedmann .556). 13) There is a significant and unidirectional relationship between maternal education and the incidence of anemia (p value 0.000; OR 7.63; Friedmann .442). 14) There is a very weak and unidirectional significant relationship between maternal nutritional status and the incidence of anemia (p value 0.000; OR 0.33; Friedmann .140). 15) There is a moderate and unidirectional significant relationship between maternal iron consumption and the incidence of anemia (p value 0.000; R 47.8; Friedmann .395). 16) There is a very strong and unidirectional significant relationship between maternal vitamin C consumption and the incidence of anemia (p value 0.000; OR 44.1; Friedmann .900). 17) There is a strong and non-directional significant relationship between the presence of complicating the mother and the incidence of anemia (p value 0.000; OR 0.995; Friedmann .548)

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