

# Analysis of Risk Factors for Anemia in Pregnant Women in the Working Area of Pasir Panjang Public Health Center Kupang

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## ABSTRACT

**Introduction:** Anemia is a complication of pregnancy that affects pregnancy, childbirth, postpartum, and the fetus. Anemia in pregnant women is called "potential danger to mother and child". The prevalence of anemia in pregnancy in the world is very high, especially in developing countries, including Indonesia. Anemia in pregnancy is one of the 15 global disease contributors, therefore anemia in pregnant women needs serious attention from all parties involved in health services. This study aims to determine the risk factors for anemia in pregnant women at Pasir Panjang Public Health Center Kupang.

**Material and methods:** This type of research is observational with a cross sectional approach. The population in this study were 168 pregnant women who had anemia. The sampling technique used simple random sampling with a total sample of 63 respondents. Data analysis used simple logistic regression and multiple logistic regression.

**Conclusion:** The results showed that the risk factors for anemia that significantly affected the incidence of anemia in pregnant women were maternal age ( $p=0.029$ ), parity ( $p=0.000$ ), knowledge ( $p=0.019$ ), and compliance with taking tablets. Fe ( $p=0,000$ ). And the risk factor that most influenced the occurrence of anemia in pregnant women at Puskesmas Pasir Panjang Kupang City was compliance with consuming Fe tablets ( $p=0.000$ ; OR=24.028; 95% CI: 4.478-128.925). It can be concluded that the risk factor for anemia in pregnant women that influences the effect is compliance with consuming Fe tablets.

**Keywords:** Anemia in Pregnant Women, Age, Nutritional Status, Knowledge, Compliance in Consuming Fe Tablets

fetal death, LBW, congenital defects, and abortion.<sup>2</sup>

The results of previous research conducted at the Pasir Panjang Public Health Center Kupang recorded an increase in the incidence of anemia in pregnant women in 2016-2018, where in 2016 the mother experienced anemia was 23.7%, in 2017 it was 24.8%, and in 2018 as much as 29.5%.

To overcome the problem of anemia in pregnant women at the Pasir Panjang Public Health Center Kupang health workers have provided counseling and Fe tablets to reduce the incidence of anemia, but in reality, the incidence of anemia is still high. Based on the description of the problems above, the researcher is interested in conducting research on "Analysis of Risk Factors for Anemia in Pregnant Women in the Working Area of Pasir Panjang Public Health Center Kupang".

## MATERIAL AND METHODS

This type of research was an observational study with a cross-sectional approach. Cross-sectional research is a study that examines the relationship between risk factors (independent) and effect factors (dependent) in which variables are observed or measured simultaneously.<sup>3</sup> This research was conducted at the Pasir Panjang Health Center in Kupang City in July-August 2020 after Nusa Sandalwood University's Health Research Ethics Committee received ethical approval. The population in this study was all pregnant women with anemia who attended Pasir Panjang Health Center, a total of 168 people. The sample used in this study consisted of 63 pregnant women with anemia according to the inclusion criteria, namely pregnant women with anemia who are willing to be interviewed, pregnant women living in the long sandy area, pregnant women with pregnancy in the second and third trimester, who have already done this. Examination of at least 1 visit in the first trimester and pregnant women with no chronic history (tuberculosis, malaria, hepatitis).

## INTRODUCTION

Anemia in pregnant women is called "potential danger to mother and child". Anemia during pregnancy is an important health problem in an effort to improve the degree of public health in relation to the health of mothers and children.<sup>1</sup>

The World Health Organization (WHO) in 2015 stated that the prevalence of anemia is almost evenly distributed in various regions of the world, around 40-88% of maternal deaths in developing countries are related to anemia during pregnancy. The prevalence of anemia in pregnant women in 2015 was estimated to be 52.4% in Africa, 24.1% in America, and 24.1% in Europe. Meanwhile, the prevalence of anemia in pregnant women in Indonesia in 2018 was 48.9%.

The period of pregnancy, especially the second and third trimesters, is a critical period in which the need for iron increases. Pregnant women who are deficient in iron can cause bleeding after childbirth, even infection, intra-uterine

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The sampling method in this study used a simple random sampling method performed using a lottre technique. For the sampling frame or the population frame in this study, a register book for pregnant women was used, which was used as a data or reference for performing sampling. The data collected in this study consisted of primary data and secondary data. Primary data were obtained by filling out questionnaires directly to respondents on factors related to anemia in pregnant women and secondary data in the form of data on the extent of anemia in pregnant women who checked their pregnancies, hemoglobin data, and PURPLE size. The variables in this study consisted of independent variables, namely age, parity, knowledge, and maternal compliance with Fe tablets. While the dependent variable is anemia in pregnant women. The analysis used was univariate analysis, bivariate analysis using a simple logistic regression test, and multivariate analysis using multiple logistic regression tests.

**RESULT**

**3.1 Characteristics of Respondents**

The characteristics of this study are described as follows:

Variable	n	%
Age		
At Risk	5	7,9
Not At Risk	58	92,1
Parity		
At Risk	21	33,3
Not At Risk	42	66,7
Knowledge		
Less	30	47,6
Enough	19	30,2
Well	14	22,2
Compliance in consuming Fe tablets		
Obedient	40	63,5
Disobedient	23	36,5
Anemia		
Moderate anemia	22	34,9
Mild anemia	41	65,1

**Table-1:** Characteristics of Pregnant Women in the Working Area of the Pasir Panjang Public Health Center Kupang in 2020

Based on table 1, it showed that the majority of respondents (92.1%) were 20-35 years old (not at risk). Most of the respondents (66.7%) parity 1-3 times (not at risk). Most of the respondents' knowledge (47.6%) had less knowledge ≤ 55%. Compliance in consuming Fe tablets (63.5%). Meanwhile, most of the respondents had mild anemia (65.1%).

**3.2 The Influence of Risk Factors for Anemia**

The influence of risk factors in this study is described as follows:

Based on table 2, it showed that the most respondents aged 20-35 years (not at risk) had a tendency to be at risk of mild anemia as many as 40 respondents (63.5%). Hypothesis examiners were carried out using the Kendal Tau correlation analysis, the p-value was 0.029 <0.05 with a closeness value of 0.278. The results of this analysis can be concluded that there is an effect of age on the incidence of anemia in pregnant women at the Pasir Panjang Public Health Center Kupang.

Based on table 3, it showed that the results of the study in most respondents that parity were not at risk of having a risk of mild anemia were 35 respondents (55.6%). Hypothesis examiners were carried out using the Kendal Tau correlation analysis, the p-value was 0.000 <0.05 with a closeness value of 0.542. From the results of this analysis, it can be concluded that there is an effect of parity on the incidence of anemia in mothers at the Pasir Panjang Public Health Center Kupang.

Based on table 4, it showed that the results of the study on the majority of respondents who had enough knowledge and had a tendency to be at risk of mild anemia were 17 respondents (27%). Hypothesis examiners were carried out using the Kendal Tau correlation analysis, the p-value was 0.019 <0.05 with a closeness value of 0.282. From the results of this analysis, it can be concluded that there is an influence of knowledge on the incidence of anemia in pregnant women at the Pasir Panjang Public Health Center Kupang.

Based on table 5, it showed that the results of the study of the most respondents in the obedient category had a risk of mild anemia as many as 35 respondents (55.6%). Hypothesis examiners were carried out using the Kendal Tau correlation analysis, the p-value was 0.000 <0.05 with a closeness value

Age	Moderate Anemia		Mild Anemia		Total		P-value	Relationship closeness
	n	%	n	%	N	%		
At Risk	4	6,3	1	1,6	5	7,9	0,029	0,278
Not At Risk	18	28,6	40	63,5	58	92,1		
Total	22	34,9	41	65,1	63	100		

**Table-2:** Distribution of Maternal Age Cross Tabulation Against The Incidence of Anemia in Pregnant Women at the Pasir Panjang Public Health Center Kupang in 2020

Parity	Moderate Anemia		Mild Anemia		Total		P-value	Relationship closeness
	N	%	N	%	n	%		
At Risk	15	23,8	6	9,5	21	33,3	0,000	0,542
Not At Risk	7	11,1	35	55,6	42	66,7		
Total	22	34,9	41	65,1	63	100		

**Table-3:** Distribution of Parity Cross Tabulation in the Incidence of Anemia in Pregnant Women at the Pasir Panjang Public Health Center Kupang in 2020

Knowledge	Moderate Anemia		Mild Anemia		Total		P-value	Relationship closeness
	n	%	n	%	N	%		
Less	16	25,4	14	22,2	30	47,6	0,019	0,282
Enough	2	3,2	17	27	19	30,2		
Well	4	6,3	10	15,9	14	22,2		
Total	22	34,9	41	65,1	63	100		

**Table-4:** Distribution of Cross Tabulation of Knowledge in the Incidence of Anemia in Pregnant Women at Pasir Panjang Public Health Center Kupang in 2020 (n = 63)

Compliance in Consuming Fe Tablets	Moderate Anemia		Mild Anemia		Total		P-value	Relationship closeness
	n	%	n	%	N	%		
Tidakpatuh	17	27	6	9,5	23	36,5	0,000	0,620
Patuh	5	7,9	35	55,6	40	63,5		
Total	22	34,9	41	65,1	63	100		

**Table 5:** Distribution of Cross Tabulation of Compliance in Consuming Fe Tablets in the Incidence of Anemia in Pregnant Women at Pasir Panjang Public Health Center Kupang in 2020 (n = 63)

Variable	Sig.	Exp(B)	95,0% C.I.for EXP(B)	
			Lower	Upper
Age	.307	6.289	.185	214.360
Parity	.003	13.886	2.407	80.122
Knowledge	.729	1.190	.444	3.194
Compliance in consuming Fe tablets	.001	23.912	3.963	144.269

**Table-6:** Results of Analysis of the Most Dominant Factors Affecting the Incidence of Anemia in Pregnant Women at the Pasir Panjang Public Health Center Kupang in 2020

of 0.620. The results of this analysis can be concluded that there is an effect of adherence to consuming Fe tablets on the incidence of anemia in pregnant women at the Pasir Panjang Public Health Center Kupang.

This showed that when the analysis was carried out together with the order of the strength of the effect from the largest to the smallest with  $p < 0.05$ , it was compliance in consuming Fe tablets (OR = 23,912) and parity (OR = 13,886).

## DISCUSSION

### 4.1 Effect of maternal age on the incidence of anemia in pregnant women

Age is one of the factors in the occurrence of anemia, as in the theory of <sup>4</sup>that a healthy and safe reproductive age with anemia in pregnant women is 20-35 years old, because the means of reproduction are still optimal. Pregnancy <20 years is a high-risk pregnancy which is 2-4 times higher than pregnancy in women of reproductive healthy age. This happens because at that age, biological development, in this case the reproductive system, is not optimal and at <20 years of age it is still in growth and development so that food input is widely used for maternal growth which can result in impaired fetal growth. Meanwhile, pregnant women aged > 35 years tend to experience anemia due to the effect of decreased iron reserves in the body.

The results of this study indicate that there is an effect of maternal age on the incidence of anemia in pregnant women at the Pasir Panjang Public Health Center Kupang. Mothers aged 20-35 years who are classified as not at risk tend to experience mild anemia at the Pasir Panjang Public Health

Center Kupang. Whereas in theory, the age of 20-35 years is a healthy reproductive age and pregnancies at the age of <20 and > 35 years are high-risk pregnancies which are 2-4 times higher and tend to experience anemia.

According to the researcher's analysis, respondents with no risk age, namely 20-35 years, who experience anemia are an indication that a lack of knowledge, biological development, and nutritional intake can occur at a healthy reproductive age. Maternal knowledge about nutrition and anemia in pregnancy will affect food consumption patterns. Lack of knowledge allows the mother to not pay attention to the health of the mother during pregnancy, for example, the lack of attention to the fulfillment of foods containing iron, which causes anemia in pregnant women. The more knowledge of pregnant women about nutrition and health, the more various types of food they consume, so that they can meet nutritional adequacy and avoid anemia in pregnant women. In addition, the wrong diet is usually the cause, so that daily iron needs are not met. There are even some foods that can inhibit the absorption of iron by the body, such as tanni (tea, chocolate, apple juice, peanuts), polyphenols (chocolate, peas, and cereal including wheat), calcium (in milk), and zinc. (in brown rice).

The results of this study are also in line with the research of <sup>5</sup> that the results of bivariate analysis showed that there was a significant relationship between maternal age and anemia ( $p$ -value 0.017 < 0.05). From this research it is known that the age of 20-35 years old is not yet optimal in terms of mentality with emotions that tend to be unstable. This immature mental condition can cause the mother to experience shocks which

can result in a lack of attention to fulfilling nutritional needs related to deterioration and decreased endurance and various diseases that often afflict this age. Various factors influence each other and do not rule out even a mature age for pregnancy, namely the age of 20-35 years, the incidence of anemia that occurs is much higher.

#### **4.2 Effect of parity on the incidence of anemia in pregnant women**

Parity is the number of previous births, whether born alive or stillborn. Mothers who have been pregnant more than 4 times are also at risk of developing anemia. Parity is more risky when it comes to short birth interval, in this case it will be related to previous pregnancies where if the iron reserves in the body are reduced, the pregnancy will deplete the iron supply in the body and will cause anemia in subsequent pregnancies. Parity 2-3 is the safest parity in terms of maternal mortality.<sup>4</sup>

The results of this study indicate that there was an effect of nutritional status on the incidence of anemia in pregnant women at the Pasir Panjang Public Health Center Kupang. According to the researcher's analysis, that respondents who gave birth 2-3 times at the Public Health Center did not rule out the possibility of not experiencing anemia if they did not pay attention to the nutritional needs during pregnancy, because during pregnancy the nutrients would be shared with the mother and the fetus. The more often a woman gets pregnant and gives birth, the more iron she loses so that it can increase the risk of anemia. This is also in line with <sup>6</sup> theory which states that the more often women undergo pregnancy and childbirth, the more iron they lose and become anemia. If the supply of iron reserves is minimal, then every pregnancy and childbirth will deplete the iron reserves in the body and eventually cause anemia in subsequent pregnancies.

The results of this study are in line with research by <sup>7</sup> that in their research, there was a significant relationship between parity and anemia in pregnant women in the third trimester in Yogyakarta in 2017 (p-value 0.023). It is also in line with <sup>8</sup> study showing that mothers with parity of two or more were at 2.3 times greater risk of developing anemia than mothers with parity of less than two.

#### **4.3 The influence of knowledge on the incidence of anemia in pregnant women**

The need for pregnant women for iron (Fe) increases by 0.8 mg in the first trimester and increases sharply in the third trimester, namely 6.3 mg a day. It is impossible for such a large amount to be fulfilled only through food, especially if it is supported by the lack of knowledge of pregnant women about the increased need for iron (Fe) during pregnancy, which causes anemia in pregnant women. Pregnant women with low knowledge of iron (Fe) will behave less obediently in consuming iron (Fe) tablets and also in choosing food sources of iron (Fe). On the other hand, pregnant women who have good knowledge of iron (Fe) tend to use more rational considerations and are more obedient in consuming iron (Fe) tablets.<sup>1</sup>

The results of this study indicate that there was an effect of

knowledge on the incidence of anemia in pregnant women at the Pasir Panjang Public Health Center Kupang. According to the researcher's analysis, most of the pregnant women at the Pasir Panjang Public Health Center did not get related knowledge and information about nutrition, the benefits of consuming Fe tablets, and the dangers of anemia in pregnant women and their fetuses. The low knowledge of pregnant women at the health center will affect the choice of foods containing iron that are needed by mothers and their non-compliance in consuming Fe tablets. The more knowledge or information given to pregnant women at the health center about nutrition, the benefits of consuming Fe tablets and the dangers of anemia in pregnancy, the more various types of food will be consumed so that they can meet nutritional adequacy, maintain the health of the mother and fetus, and avoiding anemia in pregnant women. Meanwhile, pregnant women who have good and sufficient knowledge at the Pasir Panjang Public Health Center who experience anemia also know about nutrition, the benefits of consuming Fe tablets, and the danger of anemia in pregnancy, but because of work factors that make them tired, they forget to take Fe tablets which are at least once a day. The less knowledge and information the mother gets, the more women will experience anemia during pregnancy. Mothers who are well informed and sufficient are also not free from anemia if they do not consume Fe tablets and foods that contain lots of iron during pregnancy.

The results of this study are in line with the research of<sup>9</sup>, the results of statistical tests were obtained ( $p = 0.026 < 0.05$ ) so that there was a significant effect of the knowledge variable on the consumption of blood-supplemented tablets for pregnant women at Maron Public Health Center Probolinggo Regency. From the results of the analysis, it was found that pregnant women had less knowledge of the possibility of not taking tablets regularly by 2,720 times compared to pregnant women who had good knowledge. This research is supported by previous research, which stated that maternal knowledge could affect the consumption of blood-supplemented tablets. Pregnant women with good knowledge will tend to consume blood-supplemented tablets regularly compared to pregnant women who have less knowledge in consuming blood-supplemented tablets for anemia prevention.

#### **4.4 Effect of compliance in consuming fe tablets on the incidence of anemia in pregnant women**

Every pregnant woman is expected to take at least 90 tablets during pregnancy, as soon as possible after the nausea has reduced or disappeared. Iron from food cannot be fulfilled during pregnancy, because iron is not only needed by the mother but also for the fetus in her womb. Consumption of iron tablets properly provides an opportunity to prevent pregnant women from anemia. In order to drink properly according to the rules, obedience and awareness of pregnant women is very much needed in consuming it. Adherence to consuming iron tablets (Fe) was measured from the accuracy of the number of tablets consumed, the accuracy of how to consume iron tablets, and the frequency of consumption per day.<sup>10</sup>

The results of this study indicate that there was an effect of compliance in consuming Fe tablets on the incidence of anemia in pregnant women at the Pasir Panjang Public Health Center Kupang. According to the researcher's analysis, pregnant women at health centers are encouraged to consume Fe tablets regularly at least 90 tablets during their pregnancy, because the need for iron in pregnant women will continue to increase during pregnancy. Pregnant women in health centers who consume Fe tablets regularly but still experience anemia, due to other factors, one of which is the mother's lack of knowledge, which affects the selection of foods that contain high nutritional value. Where during pregnancy, iron is not only obtained from Fe tablets, but must consume foods that contain lots of iron. Without a good mother's knowledge of iron, it is difficult for mothers to instill the habit of using foods that contain iron sources which are important for the health of pregnant women. Apart from that, other factors that also influence the occurrence of anemia even though the mother is obedient to consuming Fe tablets regularly are age, parity, and birth spacing. Meanwhile, pregnant women in health centers who do not comply with consuming Fe tablets regularly are because pregnant women admit to forgetting when to consume Fe tablets, their lack of knowledge about the benefits of consuming Fe tablets, lack of knowledge on the selection of foods that contain high nutritional value, and how to consume Fe tablets properly. They also admit that they have to stop consuming Fe tablets because of the taste and side effects of Fe tablets such as nausea and vomiting. The results of this study are in line with the research by<sup>11</sup> that there was a relationship between compliance in consuming Fe tablets with the incidence of anemia in pregnant women in the Rambah Samo 1 Public Health Center with p value = 0.001 (<0.05). Pregnant women who obey to consume Fe tablets include compliance with the number of tablets consumed, how to consume Fe tablets, time to consume Fe tablets, and frequency of Fe tablets consumed. Pregnant women who adhere to consuming Fe tablets can be influenced by the knowledge of pregnant women about Fe tablets. A high level of maternal knowledge can form a positive attitude towards compliance in consuming Fe tablets. Without knowledge about consuming Fe tablets, it is difficult for mothers to instill a habit of obeying in consuming Fe tablets.

## CONCLUSION

The conclusion of the study is that there is a significant effect between compliance in iron tablets consumption and the incidence of anemia in pregnant women at the Pasir Panjang Health Center Kupang.

## Recommendation

It is hoped that health workers can improve health promotion to increase knowledge about pregnancy to prevent anemia, provide information about safe gestational age (20-35 years old), regulate pregnancy interval  $\geq 2$  years, and the benefits of compliance to consuming Fe tablets through counseling, posters, leaflets, or other media so that mothers can pay more attention to risk factors for anemia in pregnancy. As well as

conducting information and education counseling (IEC) for mothers with risky ages (<20 years and > 35 years) to be able to take part in the family planning program so as not to become pregnant at a risky age, and counseling adolescents not to marry at an early age so that they become pregnant at age too young and too old can be avoided and anemia can be prevented.

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