

Analysis of Anaemia Incidence in Pregnant Women

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ABSTRACT

In Indonesia, the prevalence of anaemia among pregnant women is 37%, indicating that the incidence of anaemia among pregnant women is still relatively high. In Bengkulu, Jembatan Kecil Health Centre recorded the highest number of anaemic pregnant women, 27. The purpose of this study was to determine the relationship between age, knowledge, Fe tablet consumption compliance, and class participation of pregnant women with the incidence of anaemia. This research method used an analytical survey with a cross sectional design. The sampling technique was done by total sampling, involving 93 pregnant women. There was a significant relationship between age, knowledge, Fe tablet consumption, and classes of pregnant women with the incidence of anaemia in third trimester pregnant women, with a p value = 0.001. Adherence to Fe tablet consumption was the variable that most influenced the incidence of anaemia in third trimester pregnant women with the highest Exp(B) value of 56.875. This study concluded that there is a relationship between age, knowledge, adherence to Fe tablet consumption, and activeness of pregnant women's classes with the incidence of anaemia in pregnant women at Jembatan Kecil Health Centre in 2024. It is expected that health workers monitor Fe tablet consumption through family empowerment and health cadres.

INTRODUCTION

Anaemia in pregnancy is diagnosed when haemoglobin (Hb) levels are less than 11 g/dL in the first and third trimester, less than 10.5 g/dL in the second trimester, and below 10 g/dL after delivery. This condition occurs when there are insufficient red blood cells to meet the physiological needs of the body, which varies in each individual and is influenced by factors such as gender, location of residence,

smoking habits, and stage of pregnancy (WHO, 2022) . Based on global data, the prevalence of anaemia in pregnant women in 2023 will reach 37% (WHO,2023) . In Indonesia, nationally, as many as 21.70% of pregnant women experience anaemia (Kemenkes RI,2022) . Meanwhile, the Bengkulu Provincial Health Office reported a prevalence of anaemia among pregnant women of 4.2% in 2022 (DinKes Provinsi Bengkulu,2022) . In Bengkulu



City, data from the Health Office in 2023 showed that the incidence of anaemia in Jembatan Kecil Health Centre reached 102 cases (30.44%), Beringin Raya Health Centre 27 cases (14.06%), and Sawah Lebar Health Centre 24 cases (10.12%) (DinKes Kota Bangkulu, 2023)

Anaemia in pregnancy can have adverse effects on the pregnant mother, fetus and childbirth namely severe fatigue, dizziness, shortness of breath, palpitations, decreased concentration, pallor, weakness, the emergence of other complications such as preeclampsia, premature delivery and infection. The effect on the fetus is stunted fetal growth, premature birth, low birth weight babies and fetal death while during childbirth can result in excessive bleeding, infection, fatigue in the mother during childbirth and difficulty recovering after childbirth (Prawirohardjo, 2020).

Anaemia in pregnant women is often associated with various factors, one of which is the mother's age of less than 20 years, at which age the body's organs, the reproductive system, are still in the process of maturation and development. To support the development of the reproductive

system, the body requires a lot of nutrient intake. If pregnancy occurs at this age, the nutritional needs will increase higher than pregnant women over 20 years old. In addition, women who become pregnant over the age 35 are also at risk of anaemia due to a decrease in endurance a higher risk of pregnancy problems, including anaemia (Wahyuni et al.,) . 2023

According to by Sari (2020) , anaemia in pregnant women is also caused by a lack of knowledge and non-compliance in taking iron tablets. This compliance is measured based on the of tablets consumed, the proper method of consumption, daily frequency, and the of iron supplements or Fe tablets. Non-compliance in taking iron tablets increases the risk of pregnant women developing anaemia (Astriana, 2017) . Most pregnant women who do not consume Fe tablets tend to be anaemic, so Fe tablet consumption is an important factor that determines whether a pregnant woman is anaemic or not.

Pregnancy classes play an important role in reducing the incidence of anaemia in pregnant women. Through this education in this activity, pregnant women can understand the



importance of a balanced diet, taking iron supplements, and early detection of anaemia. Participation in pregnant women's classes increases knowledge about anaemia and the importance of Fe tablets, which has an impact on increasing haemoglobin levels because mothers obediently take Fe tablets and have better knowledge about Fe, where the average increase in Haemoglobin levels in mothers who attend pregnant women's classes is higher than mothers who do not attend pregnant women's classes (Sugesti and Latifah) ., 2021

Based on this background, the purpose of this study is to determine the factors associated with the incidence of anaemia in third trimester pregnant women in the Working Area of Jembatan Kecil Puskesmas in 2024.

RESEARCH METHODS

This study is a type of quantitative research with a *cross-sectional study* approach conducted at the Jembatan Kecil Health Centre | 31 May to 24 June 2024. The variables in this study consisted of independent variables, namely the age of pregnant women, knowledge about anaemia, compliance with Fe tablet consumption and the activity of pregnant women's

classes and the dependent variable, namely the incidence of anaemia. The study population consisted of all third trimester pregnant women who met the inclusion criteria, consisting of 1) Mothers whose gestational age was in the third trimester; 2) Mothers who performed ANC at the Puskesmas and PMB in the Jembatan Kecil Puskesmas Region; 3) Mothers who were willing to become respondents by agreeing to the *informed consent* sheet. Exclusion criteria consisted of 1) Pregnant women who moved address 2) Pregnant women who were sick 5) Pregnant women whose addresses were unknown/unclear/cannot be contacted. The sample size in this study was 93 people with the sampling technique used was total sampling. Data collection was carried out primary using SOP instrument of Hb examination using digital Hb examination tool with the criteria of anaemia results if Hb level <11% and not anaemia if Hb level ≥11%, knowledge data collection using questionnaire in the form of *multichoice* questions as many as 20 questions with the criteria of poor results if score <50% and good if score ≥50%, Fe tablet consumption compliance data collection using open question questionnaire with



the criteria of poor results if consumption <90 Fe tablets and sufficient if consumption $\geq 50\%$. 90 Fe tablets and sufficient if consumption ≥ 90 Fe tablets, collecting data on the activity of pregnant women's classes using a questionnaire with open questions with the result criteria of inactive if <4 times and active if ≥ 4 times, and collecting age data using an open question questionnaire with the result criteria at risk if age <20 years and >35 years and not at risk if age 20-35 years.

Data from the study were processed and analysed with a computerised system using the *Chi-Square* test. This study has obtained ethical approval with letter number No.KEPK.BKL/505/06/2024 from the Health Research Ethics Committee of Bengkulu Health Polytechnic.

RESULTS AND DISCUSSION

The results of univariate analysis can be seen in table 1 below:

Table 1. Frequency distribution of respondents in the working area of Jembatan Kecil Puskesmas

Variables	Frequency (N=78)	Percentage (100%)
Anaemia		
-Anemia	27	34,6%
-No Anaemia	51	65,4%
Age		
- At risk	20	25,6%
- Not at Risk	58	74,4%
Knowledge		
- Less	35	44,9%
- Good.	43	55,1%
Adherence to Fe Tablet Consumption		
- Less	42	53,8%
- Enough	36	46,2%
Maternity Class Participation		
- Inactive	39	50,0%
- Active	39	50,0%

The results of the study obtained the lowest Hb level of 8.4gr%, the age of pregnant women at risk with the youngest age at 17 years old and the oldest age at 40 years old . Poor knowledge was found with the lowest score of 35% (correct 7 questions) and good knowledge with the highest score of 80% (correct 16 questions). Adherence to Fe tablet consumption was poor with only 5 tablets consumed. There were inactive pregnant women who did not attend maternity classes.

The results of bivariate analysis can be seen in table 2 below:



Table 2. The relationship between age, knowledge, adherence to Fe tablet consumption and activity of pregnant women's classes with anaemia among pregnant women in the Jembatan Kecil Puskesmas Working Area.

Variabel	Anaemia				Total		<i>p-value/ OR</i>
	Ane-mia		No		F	%	
	F	%	F	%			
Age							
At Risk (<20 and >35 Years)	17	85,0	3	15,0	20	100	0,001/ 27,200
Not at Risk (20-35 Years)	10	17,2	48	82,8	58	100	
Knowledge							
Less	22	62,9	13	37,1	35	100	0,001/ 12,862
Good	5	11,6	38	88,4	43	100	
Adherence to Fe Tablet consumption							
Less	26	61,9	16	38,1	42	100	0,001/ 56,875
Simply	1	12,5	35	97,2	36	100	
Maternity Class Participation							
Inactive	23	59,0	16	41,0	39	100	0,001/ 12,578
On	4	10,3	35	89,7	39	100	

The results of the analysis showed that there was an influence of the age of pregnant women, knowledge about anaemia, adherence to Fe tablet consumption and the activity of pregnant women's classes with the incidence of anaemia.

The Effect of Age on the Incidence of Anaemia in Pregnant Women

The results of this study showed that out of 78 respondents, most (65.4%) were not anaemic, while (34.6%) were anaemic. This condition is caused by the occurrence of haemodilution during pregnancy, where the mother's blood volume increases significantly. Haemodilution in pregnant women takes place gradually starting from 10 weeks of gestation and

reaches its peak at 24 weeks of gestation or in the second trimester.

Based on the results of the study, it is known that most pregnant women are at an at-risk age. The researcher assumed that respondents with at-risk age had a 27 times greater chance of experiencing anaemia compared to respondents who were at an age that was not at risk.

The results of this study are in line with the research of Hara et al (2022) , which showed that out of 102 pregnant women with at-risk age, 63 people (32.3%) experienced anaemia, while 39 people (20.0%) did not experience anaemia. Among the 93 pregnant women whose age was not at risk, the majority did not experience



anaemia, 55 people (28.2%), while 38 people (19.5%) experienced anaemia. The results of the *Chi-Square* test analysis showed a *p-value* of 0.004 <0.05, indicating a significant relationship between age at risk and the incidence of anaemia in third trimester pregnant women at Prambanan Health Centre.

The results of this study are in line with the research Fitriani dkk (2023), where out of 48 third trimester pregnant women, 12 people (20.7%) had an age at risk, with 4 people (6.8%) experiencing anaemia and 8 people (13.7%) not experiencing anaemia. Whereas from 36 pregnant women (79.3%) with non-risk age, 1 person (1.7%) had anaemia, and 35 people (77.5%) did not experience anaemia. Statistical tests with *Chi-Square* showed a *p* value <0.05, which indicated a significant influence between maternal age and the incidence of anaemia in third trimester pregnant women at PMB Kunti Sari Lubis, Perbaungan District, 2023.

According to Sinaga (2020), pregnancy under 20 years of age still takes place along with the process of physical growth, so the body requires more nutrients. If these needs are not

met, there will be competition the mother and fetus for nutrients, which increases the risk of anaemia pregnancy. Meanwhile, in mothers aged 35 years and above, there is a decrease in endurance and a higher tendency to get various diseases, such as infections during pregnancy, which can interfere with the absorption of nutrients, especially iron, in the body.

According to Fellanzi (2022), age is an important risk factor in the incidence of anaemia in pregnant women. Maternal age is related to the health of the female reproductive organs. Pregnancy under 20 years of age and over 35 years of age can increase the risk of anaemia. At the age of under 20 years, biologically, the mother's emotional and mental condition is still unstable and immature, which can lead to a lack of attention to nutritional needs during pregnancy. Meanwhile, over the age of 35, the decline of the immune system and the emergence of various diseases are common, which may affect the mother's health and the risk of anaemia.

Based on the results of the study and discussion, the researcher argues that maternal during pregnancy affects the incidence of anaemia, where the at-



risk ages are <20 and >35 years old. During pregnancy, mothers require higher nutrient intake than before pregnancy, including iron, folic acid and vitamins. These requirements increase to support the formation of foetal blood cells needed for growth. If iron, folic acid and vitamin requirements are not met, especially in the third trimester, pregnant women are at risk of anaemia.

The Effect of Knowledge on the Incidence of Anaemia in Pregnant Women

Based on the results of the study, it is known that most pregnant women have poor knowledge. From this data, the researcher assumed respondents with poor knowledge had a 12 times greater chance of experiencing anaemia compared to respondents who had good knowledge.

Knowledge have an important role in influencing the incidence of anaemia in pregnant women. Pregnant women with low knowledge have a 3.4 times greater risk of anaemia than those with high knowledge. Good knowledge in pregnant women helps prevent anaemia, enables them to find solutions to prevent the condition (Malaka et al., 2023).

The results of this study are in line with research by Nasir et al (2024), where out of 22 respondents with good knowledge, 16 people (72.7%) did not experience anaemia, while 6 people (27.3%) experienced anaemia. On the other hand, of the 18 respondents with poor knowledge, none were free from anaemia (0%), and all (100%) were anaemic. Statistical analysis showed a p value of 0.001, which means there is a significant relationship between knowledge and the incidence of anaemia among third trimester pregnant women in the Poleang Health Centre, Bombana Regency.

The results of this study are in line with the research of Maryati and Fitriani (2023), which states that lack of knowledge about anaemia affects health behaviour, especially in pregnant women. Low knowledge can lead to less than optimal health behaviour in preventing anaemia pregnancy. Pregnant women with limited knowledge about anaemia tend to consume less iron-rich foods due to their ignorance. This suggests an association between the level of knowledge and the incidence of anaemia among pregnant women in Ilbeju-Lekki, Lagos State, Nigeria.



This result is in line with the study of Oyerrinde et al (2023) , which showed that out of 295 respondents, those who scored less than 6 (≤ 5.99) were considered to have low knowledge about anaemia, while those who scored more than 6 ($> 6-12$) were considered to have good knowledge. Overall, about half of the respondents (50.5%) that they had insufficient knowledge about anaemia during pregnancy.

Based on the results of the research and discussion above, the researcher argues that there is a relationship between knowledge and the incidence of anaemia in pregnant women in the Jembatan Kecil Health Centre working area. The results showed that the lower the knowledge about anaemia, the higher the risk of anaemia in pregnant women.

The Effect of Adherence to Fe Tablet Consumption on the Incidence of Anaemia in Pregnant Women

Based on the results of the study, it is known that of the 42 respondents whose Fe tablet consumption compliance was poor, 26 people (61.9%) experienced anaemia, 16 people (38.1%) did not experience anaemia. Of the 36 respondents whose Fe tablet consumption compliance was

sufficient, only 1 person (2.8%) experienced anaemia, while 35 people (97.2%) did not experience anaemia. Statistical tests showed a *p*-value of 0.001, which means there is a significant relationship between Fe tablet consumption compliance and the incidence of anaemia in trimester pregnant women.

According to Hassan (2020), the proportion of anaemia was higher in pregnant women who did not take Fe tablets, at 44.4% (4/9), as well as in those who did not receive iron supplementation, at 47.8% (23/11). Iron intake showed a difference in anaemia prevalence, with 27.8% (27/97) occurring among pregnant women who had iron intake. The *p*-value of 0.001 indicates Fe tablet consumption has a significant effect on the incidence of anaemia in pregnant women.

The results of this study are in line with the research of Sari and Wigaiti(2020) , which states that the factor that affects anaemia in pregnant women is the consumption of Fe tablets, with a *p*-value of 0.003 and an OR value of 18.450. This indicates that Fe consumption has a significant effect on the incidence of anaemia in pregnant women, with a ratio of 18.450.



In line with the research of Pemiliana et al (2019) , of the 55 respondents, mothers who were obedient in taking Fe tablets and experienced anaemia were 32 people (58.2%), while those who did not experience anaemia were 21 people (38.2%), and those who experienced anaemia were 11 people (20.0%). Mothers who did not adhere to taking Fe tablets and experienced anaemia were 23 people (41.8%), with 7 people (12.7%) not anaemic, and 16 people (29.1%) experiencing anaemia. *Chi-Square* statistical test showed a *p-value* = 0.021 <0.05, so it can be concluded that there is an influence between compliance in *taking Fe tablets and the incidence of anaemia* in third trimester pregnant women.

The results of the study are in line with the research Kurniaisih (2021) , where out of 60 respondents, 29 people (48.3%) of pregnant women experienced anaemia, with a proportion of low compliance levels as many as 8 people (27.6%) and 16 people (55.2%) experiencing moderate at the high compliance level, 5 people (17.2%) experienced anaemia. Most the respondents, 31 people (51.7%), did not experience anaemia, with the

distribution at the low compliance level no one was free from anaemia (0%), while at medium compliance level, 18 people (58.1%) did not experience anaemia, and at the high compliance level, 13 people (41.9%) did not experience anaemia. The results of *Chi-Square* analysis showed a *p-value* = 0.003 <0.05, so it can be concluded that there is an effect of Fe tablet consumption compliance on the incidence of anaemia in pregnant women at Puskesmas Pitu, Ngawi Regency.

Based on the results of the study and the discussion above, the researcher argues that there is a relationship between Fe tablet consumption compliance and the incidence of among pregnant women in the Jembatan Kecil Health Centre working area. Pregnant women who experienced anaemia mostly consumed Fe tablets less than 90 tablets. The more adherent in consuming Fe tablets, the smaller the risk of anaemia in pregnant women. Treatment of anaemia is mainly done through the intake of iron which is found in Fe tablets.

The Effect of Participation in Pregnant Women's Classes on the Incidence of Anaemia in Pregnant Women



Based on the results of the study, it is known that most respondents who are not active in attending maternity classes experience anaemia. The results of the statistical test showed a *p-value* of 0.001 <0.05, indicating an association between the activity in attending classes for pregnant women and the incidence of anaemia in third trimester pregnant women in the Jembatan Health Centre Working Area in 2024.

The results of this study are consistent with the findings of Harahap et al (2023) , where the *statistical* test results show a probability value below 5% (*p-value* <0.05). This indicates that learning in pregnant women's classes has a significant influence on mothers' knowledge of anaemia prevention during pregnancy.

The results of this study are in line with the findings of Agustiniingsih and Muwakhidah (2019) , which showed that based on the measurement of respondents' knowledge in Grogol District, Sukoharjo Regency, the average knowledge score of the group who attended maternity classes was higher than the group who did not attend the class. The *Mann Whitney-U* test resulted in a *p-value* of = 0.001 <

0.05, indicating a significant difference in the level of knowledge | pregnant women who attended maternity classes and | who did not. This suggests that maternity classes have a major influence on mothers' knowledge of anaemia prevention during pregnancy.

Based on the results of the study and |above results, the researcher argues that there is a relationship between the participation of pregnant women in maternity classes and the occurrence of anaemia in pregnant women in the working area of Jembatan Kecil Health Centre. Pregnant women who experience anaemia tend | to attend maternity classes. This study has limitations, namely that the sample is not homogeneous, especially in the number of pregnancies, where the sample of this study consists of primi, multi, and grande pregnant women.

CONCLUSIONS

Based on the study of factors influencing the incidence of anaemia among third trimester pregnant women in the Jembatan Kecil Health Centre Working Area in 2024, it can be concluded that age, knowledge, Fe tablet consumption, and participation in maternity classes affect the occurrence



of anaemia among pregnant women in the area. Health workers are expected to monitor Fe tablet consumption through family empowerment and health cadres.

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