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The Influence of Education Level, Knowledge, and Pregnancy Spacing on the Incidence of Anemia Among Pregnant Women

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ABSTRACT

A pregnant woman is considered to have anemia if her hemoglobin level is less than 11 grams/dl. This disease causes problems for the mother and the fetus, including infection, bleeding, birth defects, and possibly maternal and infant death. Purpose : The purpose of this research is to identify the variables linked to the prevalence of anemia in expectant mothers at the Community Health Center. Methods : This research is cross-sectional and analytical in nature. All pregnant women in the vicinity of the Bungus Community Health Center made up the study population, and 80 pregnant women were chosen as a sample using the incidental sampling technique. Questionnaires and a digital hemoglobin equipment were used to measure hemoglobin levels. The Chi-Square statistical test was used to conduct the analysis both univariately and bivariately. Result : According to the findings, anemia affected 66.2% of expectant mothers. Factors found to be associated with the incidence of anemia were education level (p = 0.00) and pregnancy spacing (p = 0.02), while knowledge level did not have a significant relationship (p = 0.073). Implications : The study's findings indicate that while there is no appreciable relationship between knowledge level and anemia incidence, the incidence of anemia in pregnant women is connected with both pregnancy spacing and educational attainment. Conclusion : To prevent anemia, it is hoped that health professionals will take a more active role in educating expectant mothers about the value of proper diet and prenatal monitoring.

Keywords *: Anemia, Education, Knowledge, Pregnancy Spacing*

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INTRODUCTION

When the blood's hemoglobin level is below normal, it's called anemia. When there is not enough hemoglobin, the red blood cells are either too few or too distorted, or both. Symptoms include weakness, fatigue, chest tightness, shortness of breath, and others. Anemia is most frequently caused by nutritional inadequacies, particularly iron deficiency. Anemia mostly affects young people and pregnant women and is a global health problem (World Health Organizations, 2022). Anemia in pregnant women is a widespread health issue influenced by various factors, including gestational age, maternal age, economic status, and education level (Amalia Lia Nur, 2024). Specifically, a lack of knowledge about anemia is a significant determinant of anemia in pregnant women (Rismayani et al., 2023).

The growth of the fetus's brain and body cells may be hampered by iron shortage. In addition to causing low birth weight (LBW), anemia in babies, abortion, fetal death in utero, and birth defects, nutritional anemia also dramatically increases maternal morbidity and mortality as well as perinatal mortality. LBW and preterm newborns are more likely to be born to pregnant women with severe anemia, which also raises the risk of maternal and infant morbidity and mortality. A health issue that impacts the deterioration of human resource quality is anemia, which is a reflection of the importance of socioeconomic welfare in society. The term "possible danger of mother and child" refers to anemia in pregnant women that poses a risk to the mother's and the unborn child's health. According to Waryana, to diagnose anemia in pregnancy, a Hemoglobin (Hb) examination can be carried out with a Sahli tool and supervision (Nita Rukmana et al., 2023) .

According to data from the World Health Organization, 29.9% of women aged 15 to 49 had anemia globally in 2019. As the population grew, the overall number of anemic women rose quickly, from 492.9 million in 2018 to 570.8 million in 2019. The global prevalence in 2021 had cases of anemia in all ages, namely 24.5% (Gardner et al., 2023). Meanwhile, for the ASEAN region itself, the incidence of anemia reached 45.6% (World Health Organizations, 2022).

According to the Ministry of Health's (Kemenkes) from Riskesdas, the prevalence of anemia in the 15–24 age range increased from 2013 to 2018 by 18.4% to 32%, or 14.7 million persons (Kementrian Kesehatan Republik Indonesia, 2019). In 2023, 14.6% of people in the 15–24 age range had anemia (Kementerian Kesehatan RI, 2023). Worldwide, 29.9% of women of working age suffer from anemia. The anemia population group includes women of childbearing age, ages 15–49, and children under the age of five or 6–50 months, of whom 39.8% suffer from anemia. Women between the ages of 15 and 49 who are married and not pregnant, as well as those who are pregnant. Anemia is a major public health issue on a global scale. The World Health Organization estimates that anemia affects 30% of women aged 15 to 49, 37% of pregnant women, and 40% of children aged 6 to 59 months globally(Fauziah et al., 2024).

One indicator of a country's socioeconomic well-being is the Maternal Mortality Rate (MMR). The World Health Organization (WHO) estimates that the global maternal mortality rate in 2021 was 216 per 100,000 live births, or 303,000 maternal deaths. Compared to the maternal death rate in industrialized countries, which is only 12 per 100,000 live births in 2021, the rate in underdeveloped

countries is 20 times higher, at 239 per 100,000 live births. According to the World Health Organization, anemia during pregnancy accounts for 40% of maternal fatalities in developing nations. Iron deficiency and severe hemorrhage are the main causes of anemia during pregnancy, and they frequently interact. Approximately 35–37% of pregnant women have iron deficiency anemia, and the World Health Organization (WHO) reports that this frequency increases with gestational age. In 2021, the World Health Organization reported that 41.8% of pregnant women worldwide had anemia. Pregnant women in Asia are projected to have a 48.2% prevalence of anemia, 57.1% in Africa, 24.1% in America, and 25.1% in Europe (Reyna et al., 2021)(Dewi et al., 2023).

Ten pregnant women were interviewed for a preliminary study at the Bungus Health Center. The results showed that seven (70%) of the women had hemoglobin levels below 11 grams per deciliter, six (60%) had only a junior high school education or less, six (60%) had inadequate knowledge, and five (50%) had a pregnancy interval of less than 24 months. Finding the factors associated with the prevalence of anemia in expecting mothers at the Bungus Health Center is the aim of this study.

METHODS

It is an analytical survey research with a cross-sectional design. The study's participants were 503 expectant mothers who came to the KIA polyclinic at the Community Health Center to inquire about their health. Pregnant women in the first and third trimesters who visited the KIA polyclinic at the Bungus Community Health Center in Padang City to have their pregnancies checked made up the study's sample. The Lameshow formula with inclusion and exclusion criteria was used to gather samples using the accidental sampling technique. Therefore, with data collecting time, a minimum of 80 samples are required, with reserve samples accounting for 10% of the total sample. Questionnaires containing primary and secondary data kinds are used in data gathering methods. Data processing is carried out with the stages of editing, coding, entry, tabulating, and cleaning. The Chi-Square statistical test was used to assess the data both univariately and bivariately.

RESULTS

A. Univariate

1. Frequency Distribution of Anemia Incidence

Table 1. Frequency Distribution of Anemia Incidence in in Pregnant Women

No.	Anemia Occurrence	f	%
1.	Anemia	53	66.2
2.	No Anemia	27	33.8
Amount		80	100

According to Table 1, it can be seen that of the 80 respondents, 53 respondents (66.2%) were anemic, while 27 respondents (33.8%) were not anemic.

2. Frequency Distribution of Education Level on Anemi

Table 2. Frequency Distribution of Education Level in Pregnant Women

No.	Level of education	f	%
1.	basic education	54	67.5
2.	Secondary Education	23	28.8
3.	higher education	3	3.8
Amount		80	100

According to Table 2, it shows that out of 80 respondents, 23 respondents (28.8%) had Secondary Education, 54 respondents (60.0%) had basic education, and only 3 respondents (6.2%) had higher education.

3. Frequency Distribution of Knowledge in Pregnant Women

Table 3. Frequency Distribution of Knowledge in Pregnant Women

No.	Level of Knowledge	f	%
1.	insufficient knowledge	27	33.8
2.	sufficient knowledge	48	60.0
3.	good knowledge	5	6.2
Amount		80	100

According to Table 3, it shows that out of 80 respondents, 27 respondents (33.8%) had insufficient knowledge, 48 respondents (60.0%) had sufficient knowledge, and only 5 respondents (6.2%) had good knowledge.

4. Frequency Distribution of Pregnancy Spacing

Table 4. Frequency Distribution of Pregnancy Spacing

No.	Pregnancy Spacing	f	%
1.	At risk	32	40.0
2.	No Risk	48	60.0
Amount		80	100

According to Table 4, it shows that of the 80 respondents, 32 respondents (40%) had a risky pregnancy interval, and 48 respondents (60%) had a non-risky pregnancy interval.

B. Bivariate Analysis

1. Relationship between Education Level and the Incidence of Anemia in Pregnant Women

Table 5. Relationship between Education Level and the Incidence of Anemia in Pregnant Women

No.	Level of education	Anemia		Amount	%	*p-value*
		Anemia	No Anemia			

		f	%	f	%			
1.	basic education	**45**	**83.3**	**9**	**16.7**	**54**	**100**	**0.00**
2.	Secondary Education	**8**	**34.7**	**15**	**65.3**	**23**	**100**	
3.	higher education	**0**	**0**	**3**	**100**	**3**	**100**	
Amount		**53**	**66.25**	**27**	**33.75**	**80**	**100**	

Table 5 indicates that 45 (83.3%) of the 54 pregnant women with basic education had anemia, while 9 (16.7%) did not; 8 (34.7%) of the pregnant women with secondary education had anemia, while 15 (65.3%) did not; and 3 (100%) of the pregnant women with higher education did not have anemia. Based on statistical testing utilizing Chi-Square, the results showed a p-value of 0.00 (p <0.05). Given that H0 is rejected, it can be concluded that there is a correlation between pregnant women's anemia incidence and their educational attainment.

2. Relationship between Knowledge Level and Anemia Incidence in Pregnant Women

Table 6. Relationship between Knowledge Level and the Incidence of Anemia in Pregnant Women

No.	Level of Knowledge	Anemia				Amount	%	*p-value*
		Anemia		No Anemia				
		f	%	f	%			
1.	insufficient knowledge	**18**	**66.7**	**9**	**33.3**	**27**	**100**	**0.73**
2.	sufficient knowledge	**34**	**70.8**	**14**	**29.2**	**48**	**100**	
3.	good knowledge	**1**	**20**	**4**	**80**	**5**	**100**	
Amount		**53**	**66.25**	**27**	**33.75**	**80**	**100**	

Table 6 indicates that of the 27 pregnant women with low knowledge, 18 (66.7%) had anemia, which was more than the number of those without anemia, which was 9 (33.3%). Of the pregnant women with sufficient knowledge, 34 (70.8%) had anemia, while 14 (29.2%) did not, and only one (20%) had anemia, while four (80%) did not. Chi-Square statistical test findings showed a p-value of 0.073 (p>0.05). This suggests that Ha is disregarded, indicating that there is no connection between pregnant women's anemia incidence and their degree of knowledge.

3. Relationship between Pregnancy Spacing and the Incidence of Anemia in Pregnant Women

Table 7. Relationship between Pregnancy Spacing Level and the Incidence of Anemia in Pregnant Women

No.	Pregnancy Spacing	Anemia				Amount	%	*p-value*
		Anemia		No Anemia				
		f	%	f	%			

1.	At risk	**26**	**81.25**	**6**	**18.75**	**32**	**100**	**0.021**
2.	No Risk	**27**	**56.25**	**21**	**43.75**	**48**	**100**	
Amount		**53**	**66.25**	**27**	**33.75**	**80**	**100**	

According to Table 7, it shows that, out of 26 people (81.25%) pregnant women at risk of experiencing anemia are higher than those without anemia, namely 6 people (18.75%), and pregnant women without risk as many as 27 people (56.25%) experience anemia, while those without anemia are 21 people (43.75%). The results of statistical tests using Chi-Square obtained a p-value = 0.02 (p <0.05). This means that H0 is rejected so that it can be interpreted that there is a relationship between pregnancy spacing and the incidence of anemia in pregnant women.

DISCUSSION

1. Relationship between Education Level and the Incidence of Anemia in Pregnant Women

The p-value, according to the analysis, was 0.00 (p <0.05). The fact that H0 is rejected suggests that there is a connection between educational attainment and the prevalence of anemia in expecting moms. The Syafyeni Curug Tangerang Specialist Clinic found that "there is a significant relationship between the level of education and the incidence of anemia" (p-value 0.000 <0.05), which is consistent with earlier studies on risk factors for the incidence of anemia in expecting mothers. Additionally, a pregnant woman may be more susceptible to anemia during pregnancy if she has greater education(N Kamilia Fithri , Putri et., 2021).

The incidence of anemia increases with a person's level of education. The degree of pregnancy is significantly influenced by the pregnant woman's educational attainment. Mothers and their families can manage pregnancy with the aid of education. Education can also influence how pregnant women are perceived, how they handle information, and how they make decisions. Pregnant women's level of understanding about their pregnancy has an impact on pregnancy. Pregnant women's level of knowledge increases with their level of schooling. High-educated pregnant women are better prepared to face the risks of pregnancy since they know more about the condition. Meanwhile, a lack of knowledge brought on by low education results in pregnancy (Suyani, 2018).

2. The Relationship Between Knowledge Level and the Incidence of Anemia in Pregnant Women

The investigation yielded a p-value of 0.073 (p>0.05). This suggests that Ha is disregarded and that pregnant women's anemia has little to do with their educational attainment. Various data from earlier studies indicate a correlation between the occurrence of anemia in pregnant women at the Jongaya Makassar Health Center and the amount of maternal education (p value (0.026) <α value (0.05) (Wulandari, 2018).

Lack of understanding throughout pregnancy will cause pregnant women to disregard their health and ultimately take decisions that put them in risk. Preconceived notions or misconceptions regarding anemia during pregnancy and its associated conditions might make ignorance worse. One of the elements influencing someone's knowledge is information. Information has the power to

energize people. Print media (newspapers, pamphlets, posters), electronic media (television, radio, video), family, and other sources of information can all provide information (Nurdiyana et al., 2024).

3. Relationship between Pregnancy Spacing and the Incidence of Anemia in Pregnant Women

The p-value, as per the study, was 0.021 (p>0.05). Given that H0 is rejected, this implies a relationship between the frequency of anemia in expecting mothers and the interval between pregnancies.

Previous research revealed that 48 pregnant women (55.2%) had a pregnancy interval of at least two years. In comparison, 39 pregnant women (44.8%) had less than two years between pregnancies. In the third trimester, the prevalence of anemia among pregnant women at the Bagelen Health Center in Purworejo Regency was found to be associated with the duration of pregnancy.(Zuliyanti & Krisdiyanti, 2022).

After giving birth, a woman needs two to three years to recoup, get ready for the next delivery, and allow the wound to fully heal. The risk of anemia in pregnant women is one of the risks that short pregnancy intervals will raise for both the mother and the unborn child(Ismiati, 2024)

Anemia can occur in pregnant women whose pregnancy intervals are too close together. This happens because the mother's condition has not improved, resulting in less than ideal nutritional intake for the mother's body. If nutritional intake during pregnancy is insufficient, it can cause pregnant women to have chronic energy deficiency and can cause the mother to experience anemia (Octaviana & Indrasari, 2021).

CONCLUSIONS

The conclusion of this study is that the incidence of anemia among pregnant women at the Bungus Health Center is significantly influenced by education level and pregnancy spacing. The findings indicate that pregnant women with lower education levels and shorter pregnancy intervals are more likely to experience anemia. However, no significant relationship was found between the level of knowledge and the occurrence of anemia. Therefore, greater attention from healthcare professionals is needed to educate expectant mothers about the importance of proper nutrition and safe pregnancy spacing to prevent anemia during pregnancy.

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