

Relationship Between Diet and Physical Activity with the Event of Anemia in Pregnant Women

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ABSTRACT

The prevalence of anemia in pregnant women is 41.8 % . The causes of anemia in pregnancy include gravida, age, parity, education level, economic status and compliance with Fe tablet consumption, diet and physical activity. The purpose of this study was to determine the relationship between diet and physical activity with the incidence of anemia in pregnant women at Batunadua Health Center, Padangsidempuan City in 2021 . The type of research is *quantitative research with a cross sectional approach study* . The population in this study were all pregnant women at Batunadua Health Center Padangsidempuan City as many as 229 people. The sample in this study were 70 pregnant women at Batunadua Public Health Center, Padangsidempuan City using *random sampling method* . The analysis used is *Chi Square and Kolmogorov-Smirnov test* . The results of this study indicate that there is a relationship between diet ($p=0.000$) , and physical activity ($p=0.000$) with the incidence of anemia in pregnant women. The conclusion is that diet and physical activity have a relationship with the incidence of anemia in pregnant women. Suggestions for pregnant women to increase antenatal care visits and find out about the incidence of anemia in pregnancy.

Keywords:

Diet, Physical Activity, Anemia, Pregnant Women

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1. INTRODUCTION

The nutritional status of the mother before and during pregnancy can affect the growth of the fetus being conceived. If the nutritional status of the mother is normal before and during pregnancy, it is likely that she will give birth to a healthy, full-term baby with a normal weight [3]. Malnutrition in pregnant women can cause blood deficiency (anaemia). Anemia is a global public health problem that affects human health conditions as well as social and economic development in both developing and developed countries [8].

According to the World Health Organization (WHO) in 2019, it is estimated that maternal mortality is 303,000 people or around 216/100,000 live births worldwide. Globally, the prevalence of anemia in pregnant women is 41.8 % . About half of the incidence of anemia is caused by iron deficiency. The prevalence of anemia in pregnant women in Africa is 57.1% , Asia is 48.2%, Europe is 25.1% and America is 24.1%. A person is said to be anemic if the hemoglobin (Hb) level is below 11 g% in the first and third trimesters or < 10.5 % g% in the second trimester [12].

The prevalence of anemia in pregnancy in Indonesia in 2019 was 48.9% and this figure experienced a fairly high increase compared to the 2013 Riskesdas results of 37.1%. Anemia in pregnancy that most often occurs in Indonesia is caused by iron deficiency as much as 62.3% which can cause miscarriage, premature labor, uterine inertia, prolonged labor, uterine atony and cause bleeding and shock. The impact that can be caused by iron deficiency anemia in pregnant women is 12% - 28% fetal mortality, 30% perinatal mortality and 7% - 10% neonatal mortality [5].

The results of the Basic Health Research (Rikesdas) issued by the Health Research and Development Agency (Baritbankes) of the Indonesian Ministry of Health in 2018 stated that the prevalence of anemia in pregnant women in Indonesia was 48.9%. In the district/city of North Sumatra, namely the city of Medan, it is known that pregnant women experience anemia as much as 40.5 % (North Sumatra Health Office, 2019). The direct impact of anemia in pregnant women during childbirth is the occurrence of bleeding by 17,24 % . This condition certainly requires special attention to be able to reduce maternal and child mortality. Although the government has carried out an anemia control program for pregnant women by giving 90 Fe (iron) tablets to pregnant women during the pregnancy period, the incidence of anemia is still high [8]

Factors that can cause anemia in pregnancy include gravida, age, parity, education level, economic status and compliance with Fe tablet consumption, diet and physical activity. An unbalanced diet will cause an imbalance of nutrients that enter the body and can lead to malnutrition. Lack of nutritional intake in pregnant women during pregnancy in addition to having an impact on the birth weight of the baby will also have an impact on pregnant women, which will cause anemia in pregnant women (Keisnawati et al, 2015). Lack of physical activity causes the body's cell metabolism to decrease, causing a decrease in iron metabolism in the body. Iron is a component substance that forms Hb, if iron production decreases it will affect the formation of Hb which will have an impact on decreasing oxygen transport to all body cells [13].

The Indonesian government has developed a Guide to Balanced Nutrition (PGS). These guidelines aim to provide guidelines for healthy eating and behavior for all levels of society based on the principles of consuming a variety of foods, clean living behavior, maintaining a normal weight and physical activity. The hope is that the community can comply with these guidelines so that the anemia rate will decrease [5].

Research by [9] regarding the relationship between diet and physical activity with the incidence of anemia in pregnant women in the Limboto Health Center Work Area, shows that there is a relationship between diet and physical activity with the incidence of anemia in pregnant women. Pregnant women who suffer from anemia should be able to choose and consume balanced foods in accordance with the recommended nutritional adequacy rate for pregnant women, maintain a sleep pattern of at least 7-8 hours / day and adequate rest, namely not doing strenuous activities. Data from the Padangsidempuan City Health Office showed the incidence of anemia in pregnant women in 2019 was 27.87% and in 2020 there was a decrease in the incidence of anemia in pregnant women by 15.54%. Data on pregnant women at the Batunadua Health Center from January to July 2021 were 229 people, 38 people had anemia.

Based on a preliminary survey that the researchers conducted at the Batunadua Health Center, Padangsidempuan City by looking at the medical record status and direct interviews of 10 pregnant women, that 7 pregnant women experienced anemia consisting of 6 people experiencing mild anemia (hemoglobin levels between 8-11 g%) .) and 1 mother had moderate anemia (hemoglobin level 7.8 g%). The reason for pregnant women who experience anemia is due to irregular eating patterns and the food menu served is sober. This is due to inadequate economic conditions while the prices of all necessities are expensive, Fe tablets are consumed irregularly, less active physical activities are mostly sitting and lying down, and pregnant women check their pregnancy only because there are complaints such as dizziness, nausea, not according to the ANC schedule. .

Based on this background, researchers are interested in conducting research on the relationship between diet and physical activity with the incidence of anemia in pregnant women at Batunadua Health Center, Padangsidempuan City in 2021 . The purpose of this study was to determine the relationship between diet and physical activity with the incidence of anemia in pregnant women at Batunadua Health Center, Padangsidempuan City in 2021

2. METHOD

This type of research is a quantitative study with a cross sectional study approach with the aim of knowing the relationship between diet and physical activity with the incidence of anemia in pregnant women at Batunadua Health Center, Padangsidempuan City in 2021 which was observed in the same time period. This research was conducted at Batunadua Public Health Center, Padangsidempuan City. The population in this study were all pregnant women at Batunadua Health Center Padangsidempuan City as many as 229 people from January 2021 to July 2021. The sample in this study was taken by random sampling technique . The number of samples in this study were 70 people.

The research procedure started from data collection, namely, first, the researcher applied for a research permit to the Head of the Batunadua Health Center, then asked the respondent for permission to conduct research and explained the purpose of this research and asked the respondent's consent. All respondents signed the informed consent form before filling out the questionnaire, then the researcher distributed the questionnaires to the respondents. The researcher collected the questionnaire sheet again after the respondent had finished filling it out. The researcher checked the completeness of the questionnaire that had been submitted and asked the respondent to complete it if there were incomplete answers to the questionnaire and collect it again. Analysis of the data used is Chi-square and Kolmogorov-Smirnov.

3. RESULTS AND DISCUSSION

3.1. Results

Table 1. Frequency Distribution of Respondents ' Characteristics

Characteristics	n	%
Age		
At risk (<20 years >35 years)	37	52.9
No Risk (20-35 years old)	33	47.1
Education		
Tall	32	45.7
Low	38	54.3
parity		
Primigravida	43	61.4
multigravida	27	38.4
Job status		
Working	48	68.6
Doesn't work	22	31.4
Consumption of Fe tablets		
Yes	29	41.4
Not	41	58.6
Amount	70	100

Table 1 shows that the age of respondents at risk (<20 years and >35 years) is 37 people (52.9%) and the minority age is not at risk (20-35 years) is 33 people (47.1%). Based on low education as many as 38 people (54.3%) and higher education as many as 32 people (45.7%). Based on primipara parity as many as 43 people (61.4%) and multipara parity as many as 27 people (38.6%). Based on the working status as many as 48 people (68.6%) and the status not not working as many as 22 people (31.4%). Based on consuming Fe tablets as many as 29 people (41.4%) and not consuming Fe tablets as many as 41 people (58.6%).

Table 2. Distribution of the Frequency of Eating Patterns for Pregnant Women

Pregnant Mother's Diet	n	%
Not enough	37	52.9
Enough	22	31.4
Well	11	15.7
Amount	70	100

Table 2 shows that the majority of pregnant women eat a poor diet as many as 37 people (52.9%) and a minority have a good diet as many as 22 people (31.4%).

Table 3. Distribution of Physical Activity Frequency of Pregnant Women

Physical Activity of Pregnant Women	n	%
Heavy	33	47.1
Currently	31	44.3
Light	16	8.6
Amount	70	100

Table 3 shows that the majority of pregnant women are physically active as many as 33 people (47.1%) and a minority of light activities are 16 people (8.6%).

Table 4. Distribution of the Frequency of Anemia in Pregnant Women

The incidence of anemia in pregnant women	n	%
Yes	38	54.3
Not	32	45.7
Amount	70	100

Table 4 shows that the majority of pregnant women experienced anemia as many as 38 people (54.3%) and the minority did not experience anemia as many as 32 people (45.7%).

Table 5. Relationship between eating patterns and the incidence of anemia in pregnant women

Dietary habit	The incidence of anemia in pregnant women				Amount		P-value
	Yes		Not		n	%	
	n	%	n	%			
Not enough	32	86.5	5	13.5	37	100	0.000
Enough	4	18.2	18	81.2	22	100	
Well	2	18.2	9	81.8	11	100	
Amount	38	54.3	32	45.7	70	100	

Table 5 shows that respondents who eat less and have anemia in pregnant women are 32 people (86.5%), respondents have adequate diet and experience anemia in pregnant women are 4 people (18.2%), and respondents have good diet experienced anemia in pregnant women as many as 2 people (18.2%). Then respondents who eat less and do not experience anemia in pregnant women are 5 people (13.5%), respondents eat enough and do not experience anemia in pregnant women as many as 18 people (81.8%), and respondents who eat well do not experience anemia in pregnant women as many as 9 people (81.8%).

Based on the *Chi-Square* analysis, it was found that there was a relationship between diet and the incidence of anemia in pregnant women at Batunadua Health Center, Padangsidempuan City in 2021 with $p = 0.000$ ($p < 0.05$).

Table 6. Relationship between physical activity and the incidence of anemia in pregnant women

		Unstandardized Residual
N		70
Normal Parameters ^{a,b}	mean	.0000000
	Std. Deviation	.38400846
	Most Extreme Differences	
	Absolute	.251
	Positive	.251
	negative	-.246
Kolmogorov-Smirnov Z		2,099
asympt. Sig. (2-tailed)		.000

Based on the results of the *Kolmogorov-Smirnov test* in table 4.6 it can be seen that the number of respondents is 70 people with a significant magnitude of 0.000 which is smaller than (0.05). This means that the residual data is not normally distributed, so it can be concluded that the regression model does not meet the normality assumption.

3.2. Discussion

3.2.1. Relationship between diet and the incidence of anemia in pregnant women

Based on the results of the study showed that the diet with the incidence of anemia in pregnant women with a value of $p = 0.000$. In this study, it was found that the majority of pregnant women had a poor diet as many as 37 people (52.9%) and a minority with a good diet as many as 22 people (31.4%). A good diet during pregnancy can help the body cope with the special demands of being pregnant, and have a positive effect on the health of the baby. A healthy diet for pregnant women is food consumed by pregnant women must have the right amount of calories and nutrients such as carbohydrates, fats, proteins, vitamins, minerals, fiber and water. This diet is influenced by several things, namely habits, pleasures, culture, religion, economic level and nature. So that the factors that experience the diet of pregnant women affect the nutritional status of the mother [7].

Nofita et al's research [10] found a relationship between the types of food consumed by pregnant women and the incidence of high risk of anemia in pregnancy. With an OR of 1.49, which means that pregnant women who eat foods with an unbalanced menu have a 1.49 times risk of experiencing anemia compared to pregnant women who consume foods with a balanced menu during pregnancy. The more diverse types of food consumed, the easier it is to meet nutritional needs. In fact, the more diverse the food consumed, the easier it is for the body to obtain various other substances that are beneficial to health.

The researcher's assumption is that there is a relationship between the diet of pregnant women and the incidence of anemia because food intake during pregnancy will increase to meet the needs of the mother and her baby. So many mothers do not pay attention to diet. The lack of eating patterns for pregnant women can be seen from the results of the mother's answers to the research questionnaire, where the mother said she did not eat 1 piece of meat every meal in a day, said she did not eat 1 piece of tofu/tempe per meal. In addition, it can also be caused by the mother's lack of desire to eat as recommended by health workers during pregnancy. This is also caused by the

mother's purchasing power of food so that the mother eats modestly during pregnancy. Whereas the choice of food in pregnancy must be diverse and varied which includes carbohydrate sources, protein sources, fat sources, mineral sources, especially iron and vitamin C sources. The various types of food consumed meet carbohydrate sources, protein sources, fat sources, mineral sources, especially iron and vitamin sources will be able to meet the nutritional adequacy of the mother during pregnancy and maintain maternal health and avoid anemia.

The poor diet of respondents is the need for macronutrients (carbohydrates, fats, and proteins) or micro (vitamins and minerals). are not met, resulting in the emergence of various nutritional problems and anemia. The incidence of anemia in pregnant women is not only caused by a poor diet, this is evidenced by the results of research showing that there are respondents who have a sufficient and good diet but experience anemia as much as 18.2 % . This shows not only diet that affects the occurrence of anemia but other factors such as the lack of vitamin B12, protein, and Folic Acid in the food consumed as well as a lack of calcium which is needed for the growth of bones and teeth. During pregnancy, the calcium in the mother's body will be absorbed by the fetus, especially if he does not get it from food. So pregnant women should choose high calcium milk that is non-fat or low-fat. Yogurt, cheese, butter, and ice cream can also be good sources of calcium that can meet the needs of the mother during her pregnancy.

3.2.2. Relationship between physical activity and the incidence of anemia in pregnant women

Based on the results of the study showed that physical activity with the incidence of anemia in pregnant women with a value of $p = 0.000$. In this study, it was found that the majority of pregnant women were physically active with 33 people (47.1%) and a minority with light activities as many as 16 people (8.6%). According to the theory of physical activity is one of the indirect causal factors that affect the incidence of anemia. Physiologically during pregnancy there is an increase in metabolic activity in maternal tissues and additional metabolic activity due to the fetus and placenta. Therefore, strenuous physical activity will worsen the condition of maternal anemia (Ramadani et al, 2012).

This research is supported by research by Agustiana and Rosita [1], someone who has heavy physical activity will experience an oxidation process in cells that are more active than people who do light physical activity. This situation results in different energy expenditures for each activity. A lot of energy expenditure and strenuous activity if not balanced with sufficient energy consumption will result in a certain energy balance resulting in anemia.

The researchers assumed that the mother's physical activity in this study was assessed based on the routine activities carried out by pregnant women every day from waking up to going back to sleep. Heavy or light physical activity is grouped based on total energy expenditure per day. The results of statistical tests on physical activity with the incidence of anemia obtained p value = 0.000 , meaning that there is a significant relationship between physical activity and the incidence of anemia. Work related to the physical activity of pregnant women. Pregnant women as workers and housewives do more physical activity so they need more energy. Energy is produced from metabolic processes in the body. The body's metabolism in pregnant women increases by 15-20%, and will increase if the physical activity of pregnant women increases.

Among all forms of energy stores in the body, stored carbohydrates and fats are the main source of nutrients that will be used to provide energy for muscle contraction. Both will be the main source of energy for the body during activities whose personal contribution to energy production will be determined by the intensity of the activity and the length of time for the activity. Unmet energy and fat needs result in protein stores being broken down to provide the body with energy. Protein stores that are broken down cause pregnant women to experience anemia because the amount of protein that enters the body will be divided to provide energy and the formation of fetal development [4].

4. CONCLUSION

There is a relationship between diet and the incidence of anemia in pregnant women at Batunadua Health Center, Padangsidempuan City with the results of Chi-square test analysis obtained $p = 0.000$ ($p < 0.05$). There is a relationship between physical activity and the incidence of anemia in pregnant women at Batunadua Health Center Padangsidempuan City with the results of Kolmogorov-Smirnov analysis . obtained $p=0.000$ ($p < 0.05$).

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