

Relationship of Nutrition Status and Dietary Patterns to the Incidence of Anemia in Pregnant Mothers in the Third Trimester in the Working Region of Puskesmas Tanjung Enim 2023

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ABSTRACT

Background: Anemia in pregnant mothers is a condition of mothers with hemoglobin levels below 11g/dL in trimesters 1 and 3 or hemoglobins below 10.5g/dl in trimester 2 (Soebroto, 2010). Some of the factors that can cause pregnancy anemia include pregnant, age, parity, educational level, economic status, consumption of Fe tablets and dietary patterns. (Krisnawati, Yanti dan Sulistianingsih, 2015). During pregnancy, nutrients are necessary for the growth of the mother's reproductive organs as well as for the development of the fetus. The mother's requirement of iron during pregnancy is 800mg of iron. **Objective of the research:** to find out the relationship between nutrition and dietary patterns to the incidence of anemia in pregnant mothers in Puskesmas Tanjung Enim in 2023. **Research Methods:** This research is an analytical study with a cross-sectional study design or survey, and a sample of 50 respondents. This research instrument uses a food frequency questionnaire that has been validated and realistic. **Research results:** The results of the Spearman Rank Correlation Test Nutrition Status and Anemia incidence were obtained P-Value 0.04, as well as the result of the Spearman rank correlation test Eating patterns and anemia incidences < 0,000 which means there is a relationship between the nutritional status and the dietary pattern of pregnant mothers in the third trimester with the incidence of anemia. **Conclusion And Advice:** There is a significant influence on nutritional status and dietary patterns in the incidence of anemia in pregnant mothers in Puskesmas Tanjung Enim. It is recommended for pregnant mothers to apply a good diet during pregnancy, as well as can increase nutritional intake during pregnant.

Keywords: Nutrition status, Dietary patterns, Anemia, Pregnant mother

Introduction

A woman of fertile age (WUS) is a woman whose reproductive organs are functioning well between the ages of 20-45 years. The fertility age is in the range of 20-29 years. At this age a woman has a 95% chance of becoming pregnant. Pregnancy is the time when a woman carries an embryo or fetus in her body. The age of pregnancy can be determined by the egle formula, the first movement of the fetus, palpation of the abdomen, estimated height of the uterine fundus, and ultrasound. Every day there are women who die from complications of pregnancy and childbirth.

In 2010, the number of maternal deaths due to pregnancy complications in developed countries was 16 per 100,000 live births, while in the developing world it was 240 per 100 000. The figure has not met the MDGs target of a maternal mortality rate of 102 per 100,000 live births. (WHO, 2013).

The goal of national health development is to increase the ability and awareness of every person to live a healthy life in order to realize optimal public health, through the

creation of the society of the nation and the country of Indonesia characterized by its inhabitants who live with healthy behavior and a healthy environment, have

The ability to access quality and equitable health care for the achievement of an optimal level of health. To support that goal, one of the main goals is to reduce the mortality rate of mothers and babies. (Kemenkes RI, 2015).

One of the highest factors in maternal mortality is the presence of high-risk pregnancies, which are accompanied by diseases or conditions that can affect neither the mother nor the fetus. (Mardalena, 2017). Health problems in pregnant mothers are a complex problem. In Indonesia in 2017, there were 44,460 pregnant women with pregnancy complications and the maternal mortality rate was 91 per 100,000 live births. (Kemenkes RI, 2017). In Indonesia, the prevalence of anaemia among pregnant mothers in 2013 was 37.1% and in 2018 was 48.9% (Riskesdas, 2018). (Dinkes Profile Sumatera Selatan, 2017).

Anemia is one of the nutrient deficiency problems that most often strikes pregnant women. (Lone & et.al, 2018). Anemia in pregnant mothers is a condition of mothers with hemoglobin levels below 11g/dL in trimesters 1 and 3 or hemoglobins below 10.5g/dl in trimester 2. (Soebroto, 2010).

Some of the factors that can cause pregnancy anemia include pregnant, age, parity, educational level, economic status, consumption of fe tablets and dietary patterns. (krisnawati, yanti dan sulistianingsih, 2015).

Indonesian diet generally contains low animal iron sources and high vegetable iron sources that are inhibitors of nutritional absorption. (FKMUI, 2007). Good quality protein comes from animals. (Puji, Esse, Nadimin, & Fathiyatul, 2010).

During pregnancy, nutrients are necessary for the growth of the mother's reproductive organs as well as for the development of the fetus. The mother's requirement of iron during pregnancy is 800mg of iron including 300mg for the placenta fetus and 500mg for maternal erythrocytes, for which the pregnant woman needs 2-3mg of ferrous fats per day. (Manuaba, 2010). A diet is a variety of information that gives an overview of the kinds and quantities of foods that a person eats every day and is characteristic of a particular group of people. (Sulistyoningsih, 2011).

A pregnant mother needs a lot of energy produced from a source of food to be consumed with. Follow a healthy diet (Sulistyoningsih, 2011).

A healthy diet in a pregnant woman is that the food consumed by the pregnant mother should have the amount of calories and nutrients that fit her needs such as carbohydrates, fats, proteins, vitamins, minerals, fiber and water. (Manuaba, 2010). If this balanced diet is not met, then it tends to lead to pregnancy anemia.

In addition to the diet, there are a number of things that affect the availability of iron in foodstuffs, one of which is the way of processing the foodstuff. The way the processing of iron can affect the bioavailability (availability) of the iron in the food, the way the washing, for example, can dissolve iron in water. (Mariana, Wulandari, & Padila, 2018).

Prevalence of anemia in Puskesmas Tanjung Enim in January-March 2023 was 71 pregnant women. In April-May, researchers found 30 pregnant women with anemia. This high incidence of anemia in pregnant mothers makes researchers want to do it.

Methods

This research is an analytical study with a cross-sectional study design or survey. and sample *Research design* Describe the specific research design used, such as correlational, experimental, quasi-experimental, cross-sectional, and others. Provide relevant descriptions regarding the design applied in the study.

1.1 Setting and samples

State when and where the study was conducted without mentioning the specific name of the research site. Identify the sampling strategy used to recruit the samples/participants

as well as the inclusion and exclusion criteria. How samples/participants were recruited should also be stated. Also, identify the sample size (and the population, if applicable) and sample size justification, including sample size calculation or power analysis, if applicable.

1.2 *Intervention (applies to experimental studies)*

Describe the intervention, setting, and those who provided the intervention. If the study included a control group, explain what kind of intervention was provided to this group.

1.3 *Measurement and data collection;*

Mention and describe the instrument used for data collection. Clearly state whether the researchers develop, adopt, or modify the instrument from previous studies, including its citations and references. Mention the validity and reliability of the instrument, the scale, interpretation, and administration. If a translation was conducted from the original language, authors should explain the procedures used to maintain the validity and reliability of the translated instruments. Describe how data were collected. If the data were collected by research assistants, please identify this in the manuscript.

1.4 *Data analysis;*

Clearly describe the techniques used for data analysis, including the computer software used, if appropriate. Please provide relevant references for specific analytic approaches/ techniques (for qualitative studies).

1.5 *Trustworthiness/rigor (applies to qualitative studies)*

The manuscript should describe strategies used to maintain the trustworthiness/rigor of the qualitative data, such as credibility, transferability, dependability, and confirmability.

1.6 *Ethical considerations.*

Please describe the ethical issues in the study, including how informed consent was obtained from respondents/participants. Provide a statement of approval from the health research ethics committee, including its reference number.

Results

Univariate Analysis

A total of 50 respondents. This research instrument uses a food frequency questionnaire that has been validated and realised.

Frequency Distribution Based on Pregnant Mother's Nutritional Status Trimester III Puskesmas Tanjung Enim Table 1 Distribution of Frequencies

No	nutritional status	F	%
1	Very Thin IMT <17	1	2
2	Thin IMT 17-18.5	10	20
3	Normal IMT 18.5-25.0	32	64
4	Gemuk IMT >25-27	7	14
	Total	50	100

Source: Primary Data 2023

Based on table 1 of 50 respondents of pregnant mothers of trimester III in Puskesmas Tanjung Enim showed that the distribution of frequency based on the nutritional status of the pregnant mother of Trimester III more than half of the respondents had normal nutrition status 64%, but there are still respondents who have a very thin nutritive status of 2%, a thin nutrient status of 20% and an obese nutritional state of 14%.

**Frequency Distribution Based on Pregnant Mother's Diet Trimester III
Puskesmas Tanjung Enim Table 2**

No	Pola Makan	F	%
1	Kurang (128-235)	8	16
2	Cukup (236-343)	12	24
3	Baik (344-452)	30	60
	Total	50	100

Source: Primary Data 2023

Based on table 2 of 50 respondents of pregnant mothers of trimester III in Puskesmas Tanjung Enim showed that the distribution of frequency based on dietary patterns of the pregnant women of Trimester III more than half of the respondents had a diet of well 60%, but still there are respondents who have a diet less 16% and a diet quite 24%.

**Frequency distribution based on incidence of pregnant mother anemia Trimester III
Puskesmas Tanjung Enim**

Table 3 Distribution of incidence frequency Anemia Pregnant Mother

No	Kejadian Anemi	F	%
1	Anemia (11g/dL)	23	46
2	Tidak Anemia (≥ 11 g/dL)	27	54
	Total	50	100

Source: Primary Data 2023

Based on table 3 of 50 respondents pregnant mothers trimester III in Puskesmas Tanjung Enim showed that the distribution of frequency based on incidences of pregnant mother anemia III trimester more than half of the respondents did not have anemia 54% but still there are respondents with anemia 36%.

**Bivariate Analysis 1. Relationship of Nutrition Status with Pregnancy
Anemia Incidence of Pregnant Mother Trimester III in Puskesmas Tanjung
Enim**

Table 4 Relationship of Nutrition Status with the Incidence of Anemia

No	Status Gizi	Kejadian Anemia						Uji Spearman rho
		Anemia (11g/dL)				Total		
		F	%	F	%	F	%	

1	Sangat Kurus	1	2	0	0	1	2	
2	Kurus IMT 17-	8	16	2	4	10	20	

Source: Primary data 2023

Based on table 4, can be known of 50 respondents pregnant mothers trimester III in Puskesmas Tanjung Enim showed that most have normal nutritional status and do not experience anemia 40%, But still there is a very slim nutrition status and have anemia 2%, poor nutritional state and have anaemia 16%, low nutritional Status have no anemia 4%, normal nutritive status have a anemia 24%, obese nutritional statuses have a anaemia 4% and obese dietary status have no anaemia 10%. Results of the correlation test Speramean Rank obtained P-Value 0.04 < 0.05 which means there is an relationship between pregnant mother's status of the III trimester and the occurrence of anemia.

Relationship of eating patterns with the occurrence of anemia of pregnant mothers Trimester III in Puskesmas Tanjung Enim

Table 5 Relationships between eating pattern and anemia

No	Pola Makan	Kejadian Anemia						Uji Spearman rho
		Anemia (11g/dL)				Total		
		F	%	F	%	F	%	
1 2	Kurang (128-235)							
	Cukup (236-343) 7	14	1	2	8	16		
		8	16	4	8	12	24	

P Value :0.000

3	Baik (344-452)	8	16	22	44	30	60
Total		23	46	27	54	50	100

Source: Primary data 2023

Based on table 5 can be known of 50 respondents pregnant mothers trimester III in Puskesmas Tanjung Enim showed that most respondents have a good diet and do not experience anemia 44%, but still there are respondents who have a less diet and have anemia 14%, less diet has no anemia 2%, enough diet has anemia 16%, sufficient diet has not experienced anemia 8%, and have a healthy diet has anaemia 16%. Results of the Speramean Rank correlation test obtained P-Value $0,000 < 0.05$ which means there is a relationship between the diet of pregnant mother trimester 3 and the occurrence of anemia.

Discussion

Based on research conducted by researchers of 50 respondents of pregnant mothers of trimester III in Puskesmas Tanjung Enim showed that most had normal nutritional status and did not experience anemia 40%, but still there was a very thin nutrient status and suffered anemia 2%, thin dietary status and suffering anemia 16%, the thin nutrition status did not suffer anemia 4%, the normal nutritive status suffers anemia 24%, the fat nutritional Status suffer from anemia 4% and the fat nutrient Status does not experience anaemia 10%. The results of the correlation test Speramean Rank obtained P-Value $0.04 < 0.05$ which means there is

The relationship between the nutritional status of pregnant women in the third trimester and the incidence of anemia. Nutritional status is the interaction between energy consumption and protein and other nutrients with the health of the body, which affects the physical condition of the individual. (Ningrum, 2022).

The nutritional status of women of fertile age is measured using the Body Mass Index by age (BMI/U) and the assessment of nutrient status can be known by measuring human body dimensions or called anthropometry. The IMT formula according to Supriasi (Zurnila Marli, 2018) The body mass index is the standard used to determine a person who

included in the good and bad weight categories (kurang ataupun lebih). The nutritional status of the pregnant mother is based on the Body Time Index, measured by the weight before pregnancy in kilograms (kg) divided by the height in square meters (m²) and then compared to age. (Muzdalifah 2021).

Pregnant mothers who have a BMI < 18.5 (Very Slim and Slim BMI category), it is recommended to gain weight during pregnancy up to 13-18 kg. Pregnants who have an BMI 18.5-24.9 (Normal BMI) are suggested to increase weight 11-16 kg while pregnant, and pregnant mothers with an IMT > 25.00 (Fat IMT) are recommended that they gain weight in the range of 7-9 kg. (Kemenkes 2022)

The results of this study in accordance with the study conducted by Diah Mutiarasari (2019) there is a relationship between nutritional status with anemia incidence, where pregnant mothers with a good nutrition status tend to be at risk of non-anemia as much as 6.500 times compared with a lower nutritional state. In addition, nutritional Status contributes by 30.6% in affecting the occurrence of anemia. This comparative figure plays

a considerable role in affecting the health of pregnant mothers. An estimate of the determinant R^2 of 0.047 means nutritional status contributes 4.7% in influencing

There was anemia. Although the contribution value is small, as long as the β_1 regression coefficient is not statistically zero, it can scientifically prove that there is an influence between nutritional status on the incidence of anemia.

According to Handayani (2014) submitted that the low educational level factor is one of the risk factors for anemia in pregnant mothers. Based on the Nutrition Surveillance System (NSS), the educational level is used as a projection of indicators related to family socio-economic and family care patterns. A smart mother can manage nutritional food intake during pregnancy. Nutritional requirements in pregnancy vary greatly from trimester to trimester, the older pregnancies the higher nutritional requirements, so it is important that intervention reaches women before and during pregnancy so that their nutritional needs are controlled and targeted to suppress the occurrence of malnutrition during the first 1000 days. (Ghos S, dll 2019).

The strategy of the program for the prevention of anaemia in pregnant mothers according to WHO (2016) includes a diet-based approach by increasing nutritional diversity remains a major intervention when socializing with the community, the availability and accessibility of micronutrients, exclusive breastfeeding of babies up to the age of at least 6 months, improving the supply of breast-feeding, and fortification of food. Increased knowledge and

Dietary behavior changes also play a crucial role in preventing anaemia in pregnant mothers. Research conducted by Sunuwar et al (2019) revealed the need to implement educational programmes to improve the nutritional knowledge of pregnant mothers and iron-based foods such as red meat, fish, vitamin C-rich fruits, milk, eggs, and green vegetables.

Based on research conducted by researchers of 50 respondents of pregnant mothers of trimester III in Puskesmas Tanjung Enim showed that most respondents had a good diet and did not have anemia 44%, but still there are respondents who had a fewer diet and had anemia 14%, less diet did not experience anemia 2%, enough diet and suffered anemia 16%, sufficient diet does not suffer anemia 8%, and have good dietary patterns have anaemia 16%. Results of the Spearman Rank correlation test obtained P-Value $0,000 < 0.05$ which means there is a relationship between the diet pattern and the occurrence of anemia. A diet is defined as a characteristic of the activity that repeatedly eats an individual or everyone eats in meeting food needs.

(Sulistyoningsih, 2011).

A pregnant mother needs a lot of energy produced from food sources that should be consumed by following a healthy diet.

A healthy diet in a pregnant woman is that the food consumed by the pregnant mother should have the amount of calories and nutrients that fit her needs such as carbohydrates, fats, proteins, vitamins, minerals, fiber and water. (Manuaba, 2010).

This study is in line with the study carried out by Mita Mardiana (2020) the results of her research showed that pregnant mothers with anemia the majority of their diet fewer than there were 10 respondents (45,5%), while pregnant women with no anemia diet is sufficient and good that is 11 respondents each (50%). From the results of the statistical test chi square with the result of the calculation of P-values greater than 0,001 to p value ($<0,05$) and can be read H_0 in reject and H_a received which means there is a connection of

dietary patterns with the incidence of anemia in pregnant mothers in Puskesmas Banguntapan III City of Yogyakarta.

The results of this study are in line with the study conducted by Yeni Wahyuni (2019) the results of the research showed a good diet and no anemia as 34%, respondents who have a good food and anemia 0%, respondent who have enough diet and not anemia 6%, while respondents with enough diet, and anemias as 26%, respondents who have less diet and don't anaemia as 0%, responders who have fewer diet and have anemia 34%. Results of the Statistical Test with the correlation Spearman rho known indication value 0,000 <0.05, then it can be concluded there is a relationship.

According to the researchers, respondents who have a low diet and have anemia 14%, have a sufficient diet and anemia 16% and have a good diet have anemias 16%. After observing that some pregnant mothers are not regularly eating breakfast, most pregnant women prefer to eat ready-made foods without worrying about the health and calories contained in ready-to-eat foods, prefer to consume sweet tea or coffee to reduce pain and nausea during pregnancy. Pregnant mothers who consume sweet tea and coffee researchers have also recommended to eat before, to drink tea or coffee by consuming Fe tablets at least 2 hours before and 2 hours after drinking tea or tea, alternative ways in replacing drinking coffee and tea pregnant mothers can replace them with the consumption of juice, ginger juice to alleviate nausea, sensation of thin orange and sugar as well as consuming breast milk. In addition to dietary patterns, a factor that a pregnant woman should pay attention to is quality. And the quantity in the food, the food should contain carbohydrates, animal proteins, vegetable proteins and vegetables and fruits.

2. Implication and limitations

The manuscript should describe the implications of the study on nursing practices and policies based on the findings and also the limitations.

3. Conclusion

The results of the Speramean Rank Nutrition Status Correlation Test and Anemia incidence were obtained P-Value 0.04, as well as the result of the speramean rank correlation test Eating patterns and anemia incidences < 0,000 which means there is a relationship between the nutritional status and the dietary pattern of pregnant mothers in the third trimester and the incidence of anemia.

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