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RISK FACTORS FOR ANEMIA IN PREGNANCY

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ABSTRAK : FAKTOR RISIKO ANEMIA PADA MASA KEHAMILAN

Latar Belakang: Permasalahan ibu hamil yang mengalami anemia merupakan permasalahan mendasar yang perlu mendapatkan penanganan yang lebih baik. Menurut data di PMB Bidan Ketut dani SST menunjukkan ibu hamil yang berkunjung ke PMB Bidan Ketut dani SST berjumlah 485 orang. Berdasarkan observasi ada 42 (0,08%) ibu hamil yang mengalami anemia.

Tujuan: Mengetahui faktor-faktor yang berhubungan dengan kejadian anemia pada ibu hamil di PMB Bidan Ketut Dani SST Tahun 2023.

Metode: Penelitian merupakan kuantitatif, desain penelitian *cross sectional*. Populasi ibu hamil di PMB Bidan Ketut dani SST yang melakukan kunjungan dan pemeriksaan kehamilan pada Tahun 2023 sebanyak 485 orang. Sampel dalam penelitian ini adalah 87 responden. Tekhnik sampling *random sampling*, Analisa data univariate dan bivariate menggunakan *uji chi square.*

Hasil: Hasil dari 87 responden dengan status anemia sebanyak 42 responden (48,3%) dan yang tidak anemia sebanyak 45 responden (51,7%). Faktor yang berhubungan dengan anemia pada kehamilan adalah usia kehamilan p-value 0,000 (<0,05), usia ibu p-value 0,000 (<0,05), paritas p-value 0,000 (<0,05), jarak kehamilan p-value 0,000 (<0,05), Kekurangan Energi Kronis (KEK) p-value 0,000 (<0,05), dan Indeks Massa Tubuh (IMT) 0,491(>0,05).

Kesimpulan: Terdapat hubungan bahwa usia kehamilan, usia ibu, paritas, jarak kehamilan dan KEK berpengaruh terhadap anemia pada kehamilan dan tidak ada pengaruh statistic antara IMT terhadap anemia pada kehamilan.

Saran: Diharapkan bagi ibu hamil agar mencegah terjadinya anemia dengan mengkonsumsi makanan yang tinggi energi atau kalori dan memahami faktor resiko maternal terjadinya anemia.

Kata Kunci : Anemia, IMT, KEK, Paritas, Usia

ABSTRACT

Background: The problem of pregnant women experiencing anemia is a fundamental problem that needs better treatment. According to data from PMB Bidan Ketut Dani SST, there were 485 pregnant women visiting PMB Bidan Ketut Dani SST. Based on observations, there were 42 (0.08%) pregnant women who experienced anemia.

Objective: Knowing the factors associated with the incidence of anemia in pregnant women at PMB Bidan Ketut Dani SST in 2023.

Methods: The type of quantitative research, cross-sectional research design. The population of pregnant women at PMB Bidan Ketut Dani SST who made visits and pregnancy checks in 2023 was 485 people. The sample in this study was 87 respondents. The sampling technique was random sampling, univariate and bivariate data analysis using the chi square test.

Results: The results of 87 respondents with anemia status were 42 respondents (48.3%) and those who were not anemic were 45 respondents (51.7%). Factors associated with anemia in pregnancy are gestational age p-value 0.000 (<0.05), maternal age p-value 0.000 (<0.05), parity p-value 0.000 (<0.05), pregnancy spacing p-value 0.000 (<0.05), Chronic Energy Deficiency (CED) p-value 0.000 (<0.05), and Body Mass Index (BMI) 0.491 (>0.05).

Conclusion: It was concluded that gestational age, maternal age, parity, pregnancy spacing and CED had an effect on anemia in pregnancy and there was no statistical effect between BMI and anemia in pregnancy.

Suggestions: It is expected for pregnant women to prevent anemia by consuming foods high in energy or calories and understanding maternal risk factors for anemia.

INTRODUCTION

The condition known as pregnancy is a physiological condition. The pregnancy process has certain factors that can worsen the condition of the mother and child, In some cases even causing death. One of the factors is anemia. Anemia in pregnancy is defined as pregnant women who experience iron deficiency in the blood. In addition, anemia in pregnancy is defined as a condition of the mother with hemoglobin (HB) levels <11 gr / dl or hematocrit (Ht) <33%. The Center for Disease Control and Prevention defines anemia as a condition with Hb levels <11g / dL in the 1st and 3rd trimesters, Hb <10.5 g / dL in the 2nd trimester (Wibowo, 2021).

According to data from the World Health Organization (WHO) in 2018, the prevalence of anemia is still quite high. The prevalence of anemia in pregnant women in Indonesia is 41.8%, in Asia it is 48.2%, Africa 57.1%, America 24.1%, and Europe 25.1%. In Indonesia (Riskesdas, 2018) it was obtained as much as 48.9%, this percentage increased from 2013 which was around 37.1%. Data from the Lampung Province Health profile showed that 5.4% of anemia cases occurred during pregnancy, Bandar Lampung City had the highest cases of anemia during pregnancy at 10% (Kemenkes RI, 2019 dalam Carolin, 2023; Dinas Kesehatan Provinsi Lampung, 2022).

The National Maternal Mortality Rate (MMR) is stated at around 307/100,000 in live births. The triggers for death in mothers in labor include bleeding 58% with one of the triggers being anemia during pregnancy. While the neonatal mortality rate is 987/100,000 live births. If the mother experiences anemia during pregnancy, it will have a bad effect on her and the fetus. The mother will experience the risk of abortion, congenital abnormalities, premature delivery, antepartum bleeding. The fetus will be at risk of growth disorders in the womb, intrauterine asphyxia, LBW, gestosis and often infected, low IQ and can cause death (Lestari s, 2018; Priyanti, 2020).

Research conducted by Bansal, (2020) regarding the prevalence and risk factors for anemia in pregnancy, the majority of pregnant women in this study were 26-30 years old. Based on obstetric history, the majority of pregnant women were multigravida in the second trimester, 22.4% of mothers with a pregnancy gap of <2 years. The assessment obtained from mothers with comorbid conditions during pregnancy showed that the mother had a BMI> 24.9. As many as 74.8% were not compliant in consuming iron and folic acid tablets. Anemia occurs due to repeated childbirth which makes pregnant women more susceptible to malnutrition which can result in anemia and reduced iron reserves in pregnant women, so that pregnant women are at risk of losing a lot of blood during childbirth. There are a number of factors that trigger anemia cases in pregnant women, including age, parity, consumption of iron tablets, coffee and tea consumption, frequency of ANC visits, pregnancy spacing, CED status, and Body Mass Index (BMI), education status, number of family members, income, gestational age, diet, and vegetable and meat consumption habits (Amalia Djamil, 2023; Amanupunnyo, 2018; Bansal, 2020; Lugita Sari, 2021; Rizki Fauzan, 2022).

According to WHO, the large iron requirement (1000 mg) during pregnancy is not sufficient if obtained from food alone, therefore pregnant women must be assisted with iron tablet supplements. Iron supplements are given for preventive efforts and to overcome anemia which is prioritized in pregnant women. Therefore, to prevent anemia cases in pregnant women, iron supplements are given daily as much as 1 tablet (60 mg) of elemental iron 0.25 g folic acid for at least 90 days in sequence during pregnancy (Sulistyawati, 2019).

Based on PMB Midwife Ketut Dani SST, in 2023 there were 485 pregnant women who visited for antenatal care and there were 42 (0.08%) mothers who experienced anemia during pregnancy. From this background, the researcher aims to conduct a study on the risk factors for anemia during pregnancy at PMB Midwife Ketut Dani SST Rajabasa Bandar Lampung in the period October-December 2023.

RESEARCH METHODS

This study is a quantitative study with an observational analytical approach using a cross-sectional design. This study was conducted at PMB Bidan Ketut Dani, SST Rajabasa, Bandar Lampung City in 2023. This study was conducted on June 6. The population in this study were all pregnant women who visited PMB Bidan Ketut Dani SST to carry out ANC in 2023 as many as 485. The sample in this observation was 87 pregnant women who underwent HB examination and 42 pregnant women with anemia were found: 45 normal pregnant women.

The independent variables in this study are gestational age, maternal age, parity, pregnancy spacing, KEK, and BMI. Meanwhile, the dependent variable in this study is pregnant women with anemia.

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Secondary data collection was carried out by looking at patient records to evaluate the risk factors experienced by mothers with anemia. In addition, documentation was carried out using notes, transcripts, medical records.

Univariate analysis was applied in this study to understand the characteristics of pregnant women as a whole. Bivariate analysis was used to show the risk factors for anemia in pregnancy at PMB Bidan Ketut Dani, SST Rajabasa Bandar Lampung in 2023. The bivariate analysis applied in this study was the Chi-Square test. The alternative hypothesis (Ha) is accepted if the p-value generated from the Chi-Square test is less than 0.05, this implies that the observed variables have a significant relationship. Conversely, the null hypothesis (Ho) which states that there is no significant relationship between the variables studied is accepted if the p-value is greater than 0.05.

This study has received ethical eligibility information from the Malahayati University Health Research Ethics Commission, with an ethical eligibility number: No.4330/EC/KEP-UNMAL/V/2024 which is valid from May 31, 2024 to May 31, 2025.

RESEARCH RESULT
Characteristics of Pregnant Women

Based on table 1. the results were obtained from 87 respondents with anemia status as many as 42 respondents (48.3%), and not Anemia as many as 45 respondents (51.7%). The most gestational age of trimester I and III as many as 52 respondents (59.8%). Mothers with risk age as many as 26 respondents (29.9%), and the majority of reproductive age as many as 61 respondents (70.1%). The majority of mothers with multiparity parity as many as 50 respondents (57.5%) with the most pregnancy interval ≥2 years as many as 56 respondents (64.4%). The nutritional status of the mother most did not experience KEK with normal BMI as many as 55 respondents (63.2%).

Table 1
Characteristics of Pregnant Women at PMB Midwife Ketut Dani SST Bandar Lampung in 2023

Variable	n	Percentage
Hemoglobin		
Anemia	42	48,3%
Non-Anemia	45	51,7%
Gestational Age		
Trimester I dan III	52	59,8%
Trimester II	35	40,2%
Mother's Age		
<20 and >35 Years	26	29,9%
20-35 Years	61	70,1%
Parity		
Multipara	50	57,5%
Primipara	37	42,5%
Pregnancy Spacing		
<2 Years	31	35,6%
≥2 Years	56	64,4%
CED		
CED	32	36,8%
Non-CED	55	63,2%
BMI		
Abnormal	32	36,8%
Normal	55	63,2%

Table 2
Relationship between Gestational Age, Maternal Age, Parity, Pregnancy Spacing, CED and BMI to the Incidence of Anemia

Variable	Hemoglobin	Amount	p-value

		Anemia		Non-Anemia				
		n	%	n	%	n	%	
Gestational Age	Trimester I and III	34	80,1	18	40	52	59,9	0,000
	Trimester II	8	19,9	27	60	35	40,1	
Mother's Age	<20 and >35 Years	25	59,5	1	2,2	26	29,8	0,000
	20-35 Years	17	40,5	44	97,8	61	70,2	
Parity	Multipara	33	78,6	17	37,8	50	57,4	0,000
	Primipara	9	21,4	28	62,2	37	42,6	
Pregnancy	<2 Years	26	61,9	5	11,1	31	35,9	0,000
Spacing	≥ 2 Years	16	38,1	40	88,9	56	64,1	
CED	CED	28	66,7	4	8,9	32	36,8	0,000
	Non- CED	14	33,3	41	91,1	55	63,2	
IMT	Abnormal	16	38,1	16	35,6	32	36,8	0,491
	Normal	26	61,9	29	64,4	55	63,2	

Based on table 2. the results obtained respondents who experienced anemia were (48.3%), with the first and third trimester gestational age of 34 respondents (80.1%), and the second trimester age of 8 respondents (19.9%). While those who were not anemic were 45 respondents (51.7%) the first and third trimesters were 18 respondents (40%), and the second trimester gestational age of 27 respondents (60%). The results of the study obtained a p-value of 0.000 (<0.05) which means that there is a relationship between gestational age and the incidence of anemia in pregnancy at PMB Bidan Ketut Dani SST Rajabasa Bandar Lampung in 2023, with an Odds Ratio of 6.375 which means that mothers who have a gestational age at risk have a risk of causing anemia in pregnancy.

Pregnant women who experience anemia with maternal age <20 and >35 years were 25 respondents (59.5%), and maternal age 20-35 years were 17 respondents (40.5%). Meanwhile, those who were not anemic with maternal age <20 and >35 years were 1 respondent (2.2%), and those aged 20-35 years were 44 respondents (97.8%). The results of the study obtained a p-value of 0.000 (<0.05) which means that there is a relationship between maternal age and the incidence of anemia in pregnancy at PMB Bidan Ketut Dani SST Rajabasa Bandar Lampung in 2023, with an Odds Ratio of 64,706 which means that mothers who are <20 and >35 years old have a risk of causing anemia in pregnancy.

The parity status of respondents who experienced anemia with multiparous parity was 33 respondents (78.6%), and primiparous parity was 9 respondents (21.4%). Meanwhile, those who were not anemic with multiparous parity were 17 respondents (37.8%), and primiparous parity was 28 respondents (62.2%). The results of the study obtained a p-value of 0.000 (<0.05) which means that there is a relationship between parity and the incidence of anemia in pregnancy at PMB Bidan Ketut Dani SST Rajabasa Bandar Lampung in 2023, with an Odds Ratio of 6.039 which means that mothers who have multiparity have a risk of causing anemia in pregnancy. Respondents who experienced anemia with a pregnancy interval of <2 years were 26 respondents (61.9%), and a pregnancy interval of ≥2 years were 16 respondents (38.1%). While those who were not anemic with a pregnancy interval of <2 years were 5 respondents (11.1%), and a pregnancy interval of ≥ 2 years were 40 respondents (88.9%). The results of the study obtained a p-value of 0.000 (<0.05), which means that there is a relationship between maternal age and the incidence of anemia in pregnancy at PMB Bidan Ketut Dani SST Rajabasa Bandar Lampung in 2023, with an Odds Ratio of 13,000, which means that mothers who have a pregnancy gap of <2 years have a risk of causing anemia in pregnancy.

Pregnant women who experience anemia with CED are 28 respondents (66.7%), and not CED are 14 respondents (33.3%). While those who are not anemic with CED are 4 respondents (8.9%), and not CED are 41 respondents (91.1%). The results of the study obtained a p-value of 0.000 (<0.05), which means that there is a relationship between CED and the incidence of anemia in pregnancy at PMB Bidan Ketut Dani SST Rajabasa Bandar Lampung in 2023, with an Odds Ratio of 20,500, which means that mothers who have CED have a risk of causing anemia in pregnancy.

Pregnant women who experience anemia with abnormal BMI are 16 respondents (38.1%), and normal BMI are 26 respondents (61.9%). While those who are not anemic with abnormal BMI are 16 respondents (35.6%), and normal BMI are 29 respondents (64.4%). The results of the study obtained a p-value of 0.491 (> 0.05) which means that there is no relationship between CED and the incidence of anemia in pregnancy at PMB Bidan

Ketut Dani SST Rajabasa Bandar Lampung in 2023, with an Odds Ratio of 1.115 which means that mothers who have abnormal BMI do not have the risk of causing anemia in pregnancy.
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DISCUSSION
Anemia in Pregnancy

The results of the study were obtained from 87 respondents with anemia status of 42 respondents (48.3%), and non-anemia of 45 respondents (51.7%). The theory put forward by R. Y. Astutik & Fitriana, (2018) states that anemia in pregnancy occurs because the body lacks erythrocytes in the blood circulation or hemoglobin mass (HB) so that it is unable to fulfill its function as a carrier of oxygen to all tissues. HB measurement is a way to determine the risk of anemia in pregnant women. Laboratory tests can be carried out for, such as HB, Ht, RBC count, RBC shape, erythrocyte count determines the degree of anemia and iron deficiency testing, which can be done using laboratory tests, determining the degree of anemia can be done through routine blood tests.

According to the researcher's opinion, anemia in pregnancy is caused by iron deficiency, pregnant women are very susceptible to iron deficiency anemia because during pregnancy the need for oxygen is higher, triggering an increase in erythropoietin production. As a result, plasma volume increases and red blood cells (erythrocytes) increase. However, the increase in plasma volume occurs in a greater proportion when compared to the increase in erythrocytes so that there is a decrease in hemoglobin (Hb) concentration due to hemodilution.

Iron reserves in pregnant women can be low due to menstruation and poor diet. Pregnancy can increase iron requirements by two or three times. Iron is needed for the production of extra red blood cells, for certain enzymes needed for tissues, the fetus and placenta, and to replace the normal daily increase in losses. The greatest fetal iron requirement occurs during the last four weeks of pregnancy, and this requirement will be met at the expense of the mother's needs. Iron requirements during pregnancy are partially met because menstruation does not occur and there is increased absorption of iron from the diet by the intestinal mucosa although it also depends only on the mother's iron reserves. Iron contained in food is only absorbed by less than 10%, and the usual diet cannot meet the iron needs of pregnant women. Unmet iron requirements during pregnancy can result in iron deficiency anemia which can have a negative effect on both the mother and the fetus, this can cause complications of pregnancy and childbirth. In this study, indirect factors that cause anemia are gestational age, maternal age, parity, pregnancy spacing and KEK.

Gestational Age with Anemia Incidence in Pregnancy

The results of the study obtained a p-value of 0.000 (<0.05), which means that there is a relationship between gestational age and the incidence of anemia in pregnancy. This is in line with research by Bansal, (2020) which found that gestational age (p-value = 0.0001) is related to the incidence of anemia, then research conducted by Yudhya Muliani, (2020) stated that gestational age (p-value = 0.000) is related to the incidence of anemia. However, this study is not in line with Lestari, (2018) who explained that gestational age (p-value = 0.17) is not related to the incidence of anemia. Hemoglobin examination to find anemia in pregnant women is carried out in the first trimester (<3 months) and the third trimester (>6 months) of pregnancy.

Trimester III, in particular, is considered an important period where nutritional needs increase significantly. Lack of iron in the blood can cause a decrease in hemoglobin levels, which in turn can interfere with fetal growth. Several studies have shown that hemoglobin levels in pregnant women in the final trimester and high levels of anemia in the third trimester can have an impact on the birth weight of babies. Although iron intake from daily food is sufficient, additional iron tablets or vitamin supplements containing iron are still needed. Iron is not only important for maintaining a healthy pregnancy, but also to prevent the risk of postpartum hemorrhage, infection, fetal death in the womb, congenital abnormalities, and miscarriage in pregnant women who are iron deficient. In this study, pregnancy, especially the third trimester, is a critical period where the need for nutrients increases. If iron in the blood is lacking, hemoglobin levels will decrease, resulting in fetal growth disorders (Andyarini, 2018). Based on the results of research conducted by Padma, (2017) regarding the factors that influence the incidence of anemia in pregnant women, it states that trimesters 1 and 3 have a higher risk of experiencing anemia.

According to researchers, gestational age is more at risk in the first and third trimesters. The hemodilution process that begins in the first trimester causes blood volume to increase in this trimester. During hemodilution, Hb levels increase. However, because plasma volume increases by 25-30%, while the number of blood cells increases by about 20%, it results in blood dilution called hemodilution. In the first trimester, pregnant women can lose their

appetite and experience morning sickness so that the amount of food that should be consumed also decreases, accompanied by a lack of nutrients absorbed by the body, including iron. In the third trimester, the need for high nutrition for fetal growth and sharing iron in the blood to the fetus will reduce the mother's iron reserves. Therefore, pregnant women in the third trimester are at greater risk of anemia.

In this study, in the anemia group, 7 respondents were in the first trimester, 8 respondents were in the second trimester, and 27 respondents were in the third trimester. While in the non-anemia group, 5 respondents were in the first trimester, 27 respondents were in the second trimester, and 13 respondents were in the third trimester. The majority of respondents in the anemia group were in the third trimester which is a risky gestational age, while in the non-anemia group, the majority of respondents were in the second trimester, which is a non-risk gestational age. It can be concluded that gestational age (trimesters I and III) is a risk factor associated with the occurrence of anemia. However, there were 8 respondents who experienced anemia in the second trimester of pregnancy (not at risk), possibly because they had other factors because even though the 8 respondents were in a non-risk gestational age, some of them had poor age, parity, pregnancy spacing, and nutritional status so that they still had risk factors for anemia in pregnancy. Meanwhile, there were 19 respondents who did not experience anemia in the first and third trimesters of pregnancy (at risk), because even though they were at risk of pregnancy, they were at reproductive pregnancy age, had a history of parity, safe pregnancy spacing and had good nutritional status so that their pregnancy was safe and iron needs during pregnancy could be met, thus reducing the risk of anemia and no anemia occurred in pregnancy. It was found that there were 4 respondents who had very low levels (hemoglobin) of 8.3 to 7.0, it was known that 2 respondents had 5 risk factors of gestational age, maternal age, parity, pregnancy spacing and poor nutritional status, and 2 of them had 3 risk factors including parity, CED, and BMI at risk and gestational age, parity, and CED. 2 of these respondents had an age at risk and 2 of them had CED, in this study it was found that maternal age was the most influential risk factor 64 times and CED was the second highest risk factor, namely 20 times having a risk of causing anemia in pregnancy.

Maternal Age with Anemia in Pregnancy

The results of the study obtained a p-value of 0.000 (<0.05), which means that there is a relationship between maternal age and the incidence of anemia in pregnancy. This is in line with what was done by Sari S, (2021) which found that maternal age (p-value = 0.001) is related to the incidence of anemia in pregnancy, then research conducted by Amini, (2018) found that maternal age (p-value = 0.01) is related to the incidence of anemia in pregnancy, However, this study is not in line with Sari & Romlah, (2019) who explained that maternal age (p-value = 0.23) is not related to the incidence of anemia. The ideal age for a woman to get pregnant is 20-35 years, at that age women are less at risk of experiencing pregnancy complications and have healthy reproduction. This is related to the biological and psychological conditions of pregnant women. Anemia in pregnant women will be worse if pregnant under the age of 20, because young mothers need more iron for their own growth and the growth of the baby they are carrying. The risk of death in the age group under 20 years and over 35 years is three times higher compared to the healthy reproductive age group Astuti & Ertiana, 2018; Priyanti, (2020)

According to the researcher's opinion, the younger and older the age of a pregnant mother will affect the nutritional needs required. Lack of fulfillment of nutrients during pregnancy, especially at the age of less than 20 years and more than 35 years, will increase the risk of anemia. Pregnancy at the age of 35 years is at risk of anemia. This happens because in pregnancy at the age of <20 years, biologically, human emotions are not optimal and tend to be unstable and mentally immature. This results in a lack of attention to meeting nutritional needs during pregnancy.

At the age of <20 years, a woman's body condition is not ready to accept pregnancy because it is still growing. Therefore, nutrients are still needed by pregnant women for their growth and nutrition for their own pregnancy is reduced so that they are susceptible to anemia. The age of pregnant women >35 years is also related to the decline and decrease in immunity and the condition of the biological organs of pregnant women experiences a decline which causes hemoglobin production to decrease so that they are susceptible to anemia. In this study, in the anemia group, 7 respondents were aged <20 years, 19 respondents were aged >35 years, and 16 respondents were in the reproductive age of 20-35 years. While in the non-anemia group, 1 respondent was aged <20 years, and 44 respondents were in the reproductive age of 20-35 years. The majority of respondents in the anemia group were at risk of <20 and >35 years, while in the non-anemia group, the majority of respondents were in the reproductive age of 20-35 years, it can be concluded that maternal age

<20 and >35 years is a risk factor associated with the occurrence of anemia. However, there were 16 respondents in the reproductive age (20-35 years) who experienced anemia, possibly because they had other factors because even though the 16 respondents were at a safe age, some of them had poor gestational age, parity, pregnancy spacing and nutritional status so that they still had risk factors for anemia in pregnancy. Meanwhile, there was 1 respondent who did not experience anemia at a risky age <20 years, possibly because even though she was at risk, she had a history of parity, pregnancy spacing and good nutritional status so that her pregnancy was safe and her iron needs were met during pregnancy so that anemia did not occur in pregnancy.

Parity with Anemia in Pregnancy

The results of the study obtained a p-value of 0.000 (<0.05) which means that there is a relationship between parity and the incidence of anemia in pregnancy. This is in line with the research of Lestari, (2018) et al., it is known that parity (p-value = 0.04) is related to the incidence of anemia. Then research conducted by (Yudhya Muliani et al., 2020) stated that parity (p-value = 0,001) is related to the incidence of anemia.

According to the researcher's opinion, anemia has a greater risk in mothers who have high parity. the more often a woman gives birth, the more. Pregnant women with high parity or frequent childbirth will experience a greater increase in plasma volume, causing greater hemodilution. Mothers who give birth more than three times are at risk of bleeding complications which can be influenced by anemia during pregnancy and the risk of recurrent bleeding in subsequent pregnancies due to decreased hemoglobin levels. This is explained in a study conducted by Edah, (2019) in Belo Ximenes. (2021) on literature studies on risk factors for postpartum hemorrhage that mothers who have given birth >3 times are at greater risk of experiencing postpartum hemorrhage than mothers with parity 1-3. At parity >3, reproductive function declines so that the possibility of postpartum hemorrhage becomes greater. With increasing parity, there will be more connective tissue in the uterus so that the ability to contract decreases, resulting in difficulty in applying pressure to blood vessels that are open after the placenta is released. In addition, there is also regression and defects in the endometrium which results in fibrosis in the placental implantation site so that vascularization can be reduced.

In this study, in the anemia group, there were 33 multiparous respondents and 9 primiparous respondents. While in the non-anemia group, there were 17 multiparous respondents and 28 primiparous respondents. The majority of respondents in the anemia group were multiparous, while in the non-anemia group, the majority of respondents were primiparous. It can be concluded that multiparous parity is a risk factor for anemia in pregnancy. However, there were 9 primiparous respondents who experienced anemia possibly because they had other risk factors because even though the 9 respondents were in non-risk parity, some of them had a history of gestational age, maternal age, pregnancy spacing and poor nutritional status so that they still had risk factors for anemia in pregnancy. While there were 17 multiparous respondents who did not experience anemia because even though they were in risky parity, they had a history of gestational age, maternal age, pregnancy spacing and good nutritional status so that their pregnancy was safe and the mother's iron needs could be met during pregnancy so that anemia did not occur in pregnancy.

Pregnancy Spacing with Anemia Incidence in Pregnancy

The results of the study obtained a p-value of 0.000 (<0.05) which means that there is a relationship between pregnancy spacing and the incidence of anemia in pregnancy. This study is in line with research conducted by Sari & Romlah, (2019), it is known that pregnancy spacing (p-value = 0.04) is related to the incidence of anemia, then research conducted by Gusnidarsih, (2020) it is known that pregnancy spacing (p-value = 0.003) is related to the incidence of anemia.

A woman is said to give birth too often if the spacing is less than 2 years. Birth spacing that is too close can increase the risk of anemia. This is because the mother's condition has not fully recovered from the previous pregnancy and the fulfillment of nutrients is not optimal, because the mother must meet the nutritional needs for herself and the fetus she is carrying. birth spacing has a risk of 1,146 times greater risk of experiencing anemia (Astuti & Ertiana, 2018).

According to the researcher, birth spacing that is too close (<2 years) will cause low fetal quality and will also be detrimental to maternal health. Too close birth spacing causes mothers to not have the opportunity to repair their own bodies where mothers need enough energy to recover after giving birth to their children. In this study, in the anemia group, there were 26 respondents with a pregnancy spacing

of <2 years and 16 respondents with a pregnancy spacing of >2 years. While in the non-anemia group, there were 5 respondents with a pregnancy spacing of <2 years and 16 respondents with a pregnancy spacing of >2 years. The majority of respondents in the anemia group were respondents with a pregnancy spacing of <2 years, while in the non-anemia group, the majority of respondents had a pregnancy spacing of >2 years. It can be concluded that a pregnancy spacing of <2 years is a risk factor for anemia in pregnancy. However, there were 6 respondents with a pregnancy spacing of >2 years who experienced anemia, possibly because they had other risk factors because even though the 6 respondents had a risky pregnancy spacing, some of them had a history of gestational age, maternal age, parity, and poor nutritional status so that they still had risk factors for anemia in pregnancy. Meanwhile, there were 5 respondents with a gap of <2 years who did not experience anemia because even though they were at risk of pregnancy spacing, they had a history of good pregnancy age, maternal age, parity and nutritional status so that their pregnancy was safe and the mother's iron needs could be met during pregnancy so that anemia did not occur during pregnancy.

CED with Anemia In Pregnancy

The results of the study obtained a p-value of 0.000 (<0.05), which means that there is a relationship between CED and the incidence of anemia in pregnancy. This study is in line with research conducted by Lestari, (2018) which found that CED (p-value = 0,002) is related to the incidence of anemia, Then research conducted by Widya Larasati, (2018) found that CED (p-value = 0,003) is related to the incidence of anemia. While research conducted by Supriyatun, (2022) explained that CED (p-value = 0,542) is not related to the incidence of anemia.

Pregnant women who experience CED are at 3 times greater risk of experiencing anemia. CED in pregnancy is influenced by the mother's health condition before pregnancy, CED occurs due to insufficient energy intake for a long time (Yudhya Muliani, 2020).

According to the researcher's opinion, this may be related to the negative effects of protein energy deficiency and other micronutrient deficiencies. From the review of the theory, it can be seen that pregnant women who experience CED are at risk of anemia. This occurs because CED describes the nutritional status of pregnant women who are lacking. The fulfillment of pregnant women's nutrition that is still lacking causes pregnant women

with CED to be at greater risk of anemia. In this study, in the anemia group, there were 28 CED respondents and 14 respondents who did not have CED. While in the non-anemia group, there were 4 CED respondents and 41 respondents who did not have CED. The majority of respondents in the anemia group were respondents who had CED, while in the non-anemia group, the majority of respondents did not have CED. It can be concluded that CED is a risk factor for anemia in pregnancy. However, there were 14 respondents who did not have CED who experienced anemia, possibly because they had other risk factors because even though the 14 respondents did not have CED, some of them had poor gestational age, maternal age, parity, and pregnancy spacing so that they still had risk factors for anemia in pregnancy. Meanwhile, there were 4 CED respondents who did not experience anemia because even though they experienced CED, they had a good history of gestational age, maternal age, parity, pregnancy spacing, and BMI so that their pregnancy was safe and the mother's iron needs could be met during pregnancy so that anemia did not occur during pregnancy.

BMI with Anemia Incidence During Pregnancy

The results of the study obtained a p-value of 0.491 (> 0.05) which means that there is no statistically significant relationship between BMI and the incidence of anemia. In line with the opinion put forward by (Fitriah, 2018) During pregnancy, the growth process continues, namely the growth of the fetus and various growths of body organs that support the growth process so that increased metabolism in pregnant women has an impact on increasing the supply of vitamins and minerals in addition to energy, protein, and fat. If the increased need for energy, protein, fat, vitamins, and minerals cannot be met through the food consumed by pregnant women, then pregnant women will experience malnutrition which will result in low birth weight, premature birth (born prematurely), and birth with various difficulties / to death, and for mothers, the mother's weight in the first trimester <40 Kg, Body Mass Index (BMI) before pregnancy <17.0, Mother suffers from anemia.

Malnutrition in pregnant women not only has an impact on the fetus that will be born, but can also cause problems for the pregnant woman herself. Nutritional problems in pregnant women are caused by the unfulfilled nutritional needs from food, divided into macro-nutritional problems (chronic energy deficiency / KEK) and micro-nutritional problems (lack of iron, iodine and calcium). During pregnancy, mothers need quality food in sufficient quantities (not

lacking and not excessive). To meet the needs of the mother's body during pregnancy, a balanced diet is needed, where all the nutrients are needed by the body every day, although the amounts are not the same, there are nutrients that are needed in small amounts and there are also nutrients that are needed in large amounts. The comparison between carbohydrates, proteins, and fats in the daily menu must be in accordance with the body's needs (Fitriah, 2018).

According to researchers, the statistical results are not significant because BMI is not at risk of having 3 levels, namely KEK, overweight and obesity. In line with the theory presented by Marlapan, (2013); Yudhya Muliani, (2020) Pregnant women who experience KEK are at 3 times greater risk of experiencing anemia. In this theory, it is emphasized that those at risk of experiencing anemia are pregnant women with KEK conditions, while pregnant women with overweight and obese BMI are abnormal BMI but are able to have sufficient nutritional fulfillment and are not at risk of experiencing anemia. Fulfillment of nutrition during pregnancy, food intake is the main factor in meeting nutritional needs as a source of energy, maintaining body resistance in dealing with disease attacks and for growth. To get an ideal BMI, pregnant women must pay attention to the food consumed, not only the requirement to eat but the food must be healthy and nutritious by paying attention to the AKG, AKG is used for planning national food consumption & provision, assessment of food consumption in aggregate (macro) at the national level, and determination of nutritional components in the formulation of the poverty line and minimum wage with adjustments to the level of activity. The level of energy and protein consumption are two indicators of nutritional quality that are commonly used to measure nutritional status.

In this study, in the anemia group, there were 16 respondents who had abnormal BMI (4 KEK, 5 overweight, and 7 obese) and 26 respondents who had normal BMI. Meanwhile, in the non-anemia group, there were 16 respondents with abnormal BMI (1 overweight, and 15 obese) and 29 respondents with normal BMI. The majority of respondents in the anemia group were respondents who had normal BMI, while in the non-anemia group, the majority of respondents also had normal BMI. It can be concluded that in this study, BMI is a risk factor that is not related to the occurrence of anemia in pregnancy

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CONCLUSION

There are risk factors that affect the occurrence of anemia in pregnant women such as gestational age, maternal age, parity, pregnancy spacing and maternal nutritional status against CED which can be the cause of anemia in pregnancy.

SUGGESTION

Pregnant women should prevent anemia by consuming foods that are high in energy or calories and iron such as meat, chicken, fish, eggs, cereals, nuts, fruits and green vegetables and mothers can understand the risk factors for anemia by making ANC visits at least 4 times during pregnancy 1 time in the first and second trimesters, and 2 times in the third trimester.

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