Research Article

Prevalence of Anemia in Pregnant Women at Medan Tuntungan Health Center Medan City in 2023

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ABSTRACT

Background: Anemia in pregnancy can have a negative impact on pregnant women and the fetus in the womb. **Objective:** This study aimed to determine the prevalence of anemia in pregnant women at the Medan Tuntungan Health Center in 2023. **Methods:** This research was conducted at the Medan Tuntungan Health Center with data for 2023. The research design was a cross-sectional, quantitative descriptive design. The research 8sample was pregnant women who carried out Antenatal Care (ANC) examinations at the Medan Tuntungan Health Center. **Results:** A total of 107 pregnant women met the inclusion criteria. The majority of pregnancies were in the second trimester (46,7%), primigravida (40,2%), good nutrition (88.8%), below middle school education (53,3%), and non-working (73,8%). The prevalence of anemia for pregnant women at the Medan Tuntungan Health Center in 2023 was 27,1% with an average Hb level of pregnant women experiencing anemia of 9,48 g/dL. **Conclusion:** The prevalence of anemia in pregnant women was 27,1%.

Keywords: anemia, pregnant women, prevalence

1. Introduction

The World Health Organization (2019) has reported that the prevalence of anemia in pregnant women worldwide is 36.5% [1]. Meanwhile, in 2022, the prevalence of anemia in pregnant women in Indonesia was 27.7% [2]. Anemia in pregnancy can be determined if the Hb level is <11 g/dL [3]. Anemia in pregnant women can be physiological or pathological. Physiological anemia is caused by hemodynamic changes. During pregnancy, there is a greater increase in plasma volume compared to the increase in red blood cell mass (erythrocytes) [4]. Pathological anemia in pregnant women is generally in the form of nutritional deficiency anemia; this is due to physiological changes that occur in pregnant women, so that the body needs more nutrients. This causes the most common anemia in pregnant women to be nutritional deficiency anemia [5].

Medan Tuntungan Primary Health Center has a working area covering 11 sub-districts in the East Medan District. Based on preliminary research, 239 pregnant women visited Medan Tuntungan Primary Health Center in 2021. Because of the lack of data and research that has been conducted about the prevalence of anemia in pregnant women at the Medan Tuntungan Health Center, Medan City, the researcher is interested in conducting a study.

2. Methods

This research is a cross-sectional, quantitative, descriptive study [6]. The research was conducted at the Medan Tuntungan Health Center in Medan City. The data used in this study is in the form of secondary data, where the data is obtained from the register book available at the Medan Tuntungan Health Center in Medan City. The measurement aspect used in this study to measure the prevalence of anemia in pregnant women is using data taken from the register book at the Medan Tuntungan Health Center in Medan City in 2023, and measured according to the 2021 Permenkes regulation, which states that stated anemia is defined as a hemoglobin concentration of less than 11 g/dL for pregnant women [7].

3. Results

The research was done in Medan Tuntungan Health Center at Medan, and data was taken from the register Report between January 2023 and December 2023. The data obtained was from 396 pregnant women, 107 of whom fulfilled the inclusion and exclusion criteria of this research.

Table 1. Pregnant Woman Characteristics Karakteristik

Anemia Status	n	%
Anemia	29	27,1
Not Anemia	78	72,8
Gestational Age		
Trimester I	16	15
Trimester II	50	46.7
Trimester III	41	38.3
Gravida Status		
Primigravida	43	40.2
Secundgravida	33	30.8
Multigravida	25	23.3
Grandegravida	6	5,7
Nutritional Status		
Poor Nutrition	12	11,2
Good Nutrition	95	88,8
Educational Status		
Above Primary	50	46.7
Below Primary	57	53.3
Primary School Work Status		
Unemployed	79	73.8
Employed	28	26.2
Total N	107	100

According to Table 1, the majority of the trimesters of pregnancy are the second trimester, with 50 (46.7%). The majority of gravida were primigravida, 43 (40.2%). The majority are well nourished, 95 (88.8%). The majority of last education was below primary school, 57 (53.3%). The majority of the subjects were unemployed, 79 (73.8%).

Table 2. Mean Hb and Anemia Status

Anemia Status	Mean Hb (g/dL)	n	%
Anemia	9,48	29	27.1
Not Anemia	13,31	75	72.9
N	11.18	107	100,0

According to Table 2, the prevalence of anemia in pregnant women in 2023 is 27.1%. It was also found that the average Hb level of all pregnant women was 11.18 g/dL. The average Hb level in pregnant women

who have anemia is 9.48 g/dL, while the average Hb level in normal pregnant women is 13.31 g/dL.

Table 3. Anemia Status and Gestational Age

| | Gestational Age | | | | | | Total | |
| | Trimester 1 | | Trimester 2 | | Trimester 3 | | | |
	N	%	N	%	N	%	N	%
Anemia Status	3	2,8%	12	11,2%	14	13,1%	29	27,1%
	13	12,1%	38	35,5%	27	25,2%	78	72,9%
	16	15%	50	46,7%	41	38,3%	107	100%

According to Table 3, the result of crosstabulation of anemia status with gestational age, of the 16 pregnant women in the first trimester, 3 (2.8%) experienced anemia, while 13 (12.1%) were not anemic. Of the 50 pregnant women in the second trimester, 12 (11.2%) experienced anemia, while 38 (35.5%) were not anemic. Of the 41 pregnant women in the third trimester, 14 (13.1%) experienced anemia, while 27 (25.2%) were not anemic.

Table 4. Anemia Status and Gravida Status

| | Gravida Status | | | | |
Anemia Status	Primigravida	Secundgravida	Multigravida	Grandegravida	n
Anemia	12 (27,9%)	11 (33,3%)	5 (20%)	1 (16,6%)	29
Not	31 (72,1%)	22 (66,7%)	20 (80%)	5 (83,7%)	78
Total	43	33	25	6	107

According to Table 4, the result of crosstabulation of anemia status with gravida status, of the 43 pregnant women with primigravida, 12 (27.9%) had anemia, while 31 (72.1%) were not anemic. Of the 33 pregnant women with second gravida, 11 (33.3%) had anemia, while 22 (66.7%) were not anemic. Of the 25 mothers with multigravida, 5 (20%) had anemia, while 20 (80%) were not anemic. Of the 6 pregnant women with grand multipara, 1 (16.6%) had anemia, while 5 (83.7%) were not anemic.

Table 5. Nutritional Status and Anemia Status

| | | Nutritional Status | | |
		Poor Nutrition	Good nutrition	n
Anemia Status	Anemia	2 (6,9%)	27 (93,1%)	29
	Not anemia	10 (12,8%)	68 (87,2%)	78
N		12	95	107

According to Table 5, the result of crosstabulation of anemia status with nutritional status, of the 12 pregnant women with poor nutritional status, 2 (6.9%) suffered from anemia, while 10 (12.8%) were not anemic. Of the 95 pregnant women with good nutritional status, 27 (93.1%) suffered from anemia, while 68 (87.2%) were not anemic. The results of statistical tests using Pearson, $p > 0.05$ ($p = 0.393$), show that there is no relationship between nutritional status and the incidence of anemia in pregnant women.

Table 6. Work Status and Anemia Status

Work Status	Anemia Status	Normal Status	Total
Unemployed	23	56	79
Employed	6	22	28
Total	29	78	107

According to Table 6, the result of crosstabulation of anemia status with work status, of the 79 pregnant women who did not work, 23 (21.4%) had anemia, while 56 (52.3%) were not anemic. Meanwhile, of the 28 pregnant women who worked, 6 (5.6%) had anemia.

Table 7. Education Status and Anemia Status

Education Status	Anemia Status	Normal	Total
Above Primary	15	35	50
Below Primary	14	43	57
Total	29	78	107

According to Table 7, the result of the crosstabulation of anemia status and education status, of the 50 pregnant women educated above Primary, 15 (14%) experienced anemia. Meanwhile, of the 57 pregnant women educated below Primary, 14 (13%) experienced anemia.

Table 8. Mean and Median of MUAC

	MUAC
Mean	26.28
Median	26.00
Std Deviation	3.036

According to Table 8, the results of mean and median for MUAC (Mid Upper Arm Circumference), The Mean MUAC data was found to be 26.28, while the Median MUAC was 26.00.

Table 9. Hb and MUAC Crosstabulations

		MUAC															Total
		20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	
Hb	7	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
	8	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1
	9	0	0	0	1	4	0	0	1	2	0	0	0	0	0	2	10
	10	0	1	0	0	1	4	4	1	4	0	1	0	1	0	0	17
	11	2	2	4	0	5	5	4	0	2	2	2	0	3	1	0	32
	12	0	0	2	1	2	9	3	5	2	0	1	2	0	0	0	27
	13	0	0	0	0	1	1	6	1	1	1	1	0	1	1	0	14
	14	0	0	0	0	1	0	0	1	0	1	0	0	0	0	0	3
	15	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	2
	Total	2	3	6	2	15	20	17	10	11	4	6	2	5	2	2	107

According to Table 9, the result of the crosstabulation of Hb and MUAC :
- Hb 7g/dl found, 1 with MUAC 25 cm
- Hb 8 g/dl found, 1 with MUAC 30 cm
- Hb 9 g/dl found, 1 with MUAC 23 cm; 4 with MUAC 24 cm; 1 with MUAC 27 cm; 2 with MUAC 28 cm; 2 with MUAC 34 cm
- Hb 10 g/dl found, 1 with MUAC 21 cm; 1 with MUAC 24 cm; 4 with MUAC 25 cm; 4 with MUAC 26 cm; 1 with MUAC 27 cm; 4 with MUAC 28 cm; 1 with MUAC 30 cm; 1 with MUAC 32 cm
- Hb 11 g/dl found, 2 with MUAC 20 cm, 2 with MUAC 21 cm; 4 with MUAC 22 cm; 5 with MUAC 24 cm; 5 with MUAC 26 cm; 2 with MUAC 28 cm; 2 with MUAC 29 cm; 2 with MUAC 30 cm; 3 with MUAC 32 cm; 1 by 33 cm.
- Hb 12 g/dl found, 2 with MUAC 22 cm; 1 with MUAC 23 cm; 2 with MUAC 24 cm; 9 with MUAC 25 cm; 3 with MUAC 26 cm; 5 with MUAC 27 cm, 2 with MUAC 28 cm; 1 with MUAC 30 cm; 2 with MUAC 31 cm
- Hb 13 g/dl found, 1 with MUAC 24 cm; 1 with MUAC 25 cm; 6 with MUAC 26 cm; 1 with MUAC 27 cm; 1 with MUAC 28 cm; 1 with MUAC 29 cm; 1 with MUAC 30 cm; 1 with MUAC 32 cm; 1 with MUAC 33 cm.
- Hb 14 g/dl found, 1 with MUAC 24 cm; 1 with MUAC 27 cm; 1 with MUAC 29 cm.
- Hb 15 g/dl found, 1 with MUAC 24 cm; 1 with MUAC 27 cm.

4. Discussion

In this study, it was found that the prevalence of anemia in pregnant women at Tuntungan Health Center in Medan City in 2023 was 29 participants (27.1%) out of 107 participants, which is lower than the prevalence of anemia in pregnant women in Indonesia, which was around 27.7% according to Riskesdas in 2023 [2]. This figure is because participants routinely receive iron tablets from the health center every 2 weeks. This figure can be supported by the number of participants who have good nutrition, which is 95 (88.8%) [8].

Out of the desired sample of 386, only 107 participants fulfilled the criteria during this study based from the register book, from cross-tabulation between anemia status and gestational age, the result obtained were: 3 people (2.8%) in the first trimester, 12 people (11.2%) in the second trimester, and 14 people (13.1%) anemia in the third trimester who had anemia. All the pregnant women who came to the Medan Tuntungan Health Center, 19% of pregnant women in the first trimester came with anemia, 24% of pregnant women in the second trimester came with anemia, and 34% of pregnant women in the third trimester came with anemia. In this study, the group with the most pregnant women with anemia was in the third trimester. These results are similar to the research of Wahyuningsih et al. (2023) [9], where pregnant women with anemia were most dominant in the third trimester, with a percentage of 47%. According to WHO [1], the prevalence of pregnant women with iron deficiency anemia is around 35-75% which increases with increasing gestational age. This is because blood thinning during pregnancy will reach a maximum of 5-8 months; this dilution factor can cause the mother's blood hemoglobin levels to decrease to 10 gr / dL. The increasing gestational age of the mother, the greater the risk of suffering from anemia if it is not balanced with diet and Fe consumption [9].

Cross-tabulation between anemia status and nutritional status showed: 12 pregnant women with poor nutritional status, 2 (6.9%) suffered from anemia, and 95 pregnant women with good nutritional status, 27 (93.1%) suffered from anemia. The results of the Pearson test p>0.05 (p = 0.393), indicating no correlation between nutritional status and the incidence of anemia. Based on the results obtained, it could be seen that anemia can occur in pregnant women with normal nutritional status or CED (Chronic Energy Deficiency). It can be concluded that not all pregnant women with CED experience anemia. This is also similar to research by Tuti in 2017 [11], the results obtained p-value = 0.624. Tuti in 2017 [11] and Musfida in 2023 [10] showed that there was no correlation between nutritional status and the incidence of anemia, with a p-value of 0.686. This indicates that the incidence of anemia in pregnant women is not only caused by the nutritional status of the pregnant woman, but there are other influencing factors, such as pregnancy spacing, maternal education, and other factors [10].

Cross tabulation between anemia status and gravida showed: 12 (27.9%) women with primigravida, 11 (33.3%) with secundigravida, 5 (20%) women with multigravida, and 1 (16.6%) woman with grandedravida had anemia.

Based on several research results, there is a relationship, where one of the research results obtained that the statistical test results p-value = 0.003 showed that there was a relationship between gravida status and anemia during pregnancy. The high prevalence of anemia or low hemoglobin content in the blood in pregnant women who have been pregnant more than once can be caused by reduced levels of hemoglobin or iron in the blood

from the first or previous pregnancy or delivery, either during the delivery process or after delivery. In addition to gravida status, anemia is also influenced by the distance between pregnancies; pregnancies that are too close can be a factor in the occurrence of anemia during pregnancy (Idyawati, 2024)

Based on the data, it was found that anemia was most commonly found in primigravida mothers, 27.8% and the least in grandegravida mothers, 16.6%. This result is similar to research by Isnaini in 2021, which found 38% anemia in primigravida mothers and only 8% in grandegravida mothers. This is associated with the mother's lack of experience, followed by knowledge that may be lacking in dealing with all physiological or psychological changes during pregnancy. The mother's experience during pregnancy is very important because it will make her know more about how to care for her pregnancy so that her pregnancy will be healthy (Isnaini et al, 2021).

In this study, of the 79 pregnant women who did not work, 23 people (21.4%) had anemia. Meanwhile, of the 28 pregnant women who worked, 6 people (5.6%) had anemia. A study reported that there was no statistically significant relationship between work and the prevalence of anemia in pregnant women in the work area of Langensari 2 Health Center, Banjar City, where the *p-value* of the *Chi-Square* of 1,000 is greater than 0.05. Anemia is one of the risk factors in pregnant women who stay at home after giving birth. The majority of housewives only rely on their husbands' income to meet their financial obligations. Due to their inability to schedule early pregnancy check-ups and inadequate food intake, pregnant women who do not work are more likely to experience anemia (Supriatun et al, 2022).

In this study, 57 pregnant women with education below junior high school level, 14 (13%) had anemia. Research conducted by Supriyatun (2022) found no significant correlation between educational characteristics and the prevalence of anemia in pregnant women. The length of education received by a person affects their thinking capacity. Compared to people with lower levels of education, those with higher levels of education will be able to make more logical decisions and will generally be more receptive to change or new ideas. Most studies show that malnutrition, which is closely related to low maternal education, is the main cause of anemia experienced by the community (Harna et al., 2020).

Cross tabulation between Hb and MUAC obtained results were : with Hb of 7 g/dl there were 1 woman with MUAC of 25 cm; with Hb of 8 g/dl there were 1 woman with MUAC of 30 cm; with Hb of 9 g/dl there were 1 woman with MUAC of 23 cm, 4 women with MUAC of 24 cm, 1 woman with MUAC of 27 cm, 2 women with MUAC of 28 cm, and 2 women with MUAC of 34 cm; with Hb of 10 g/dl there were 1 woman with MUAC of 21 cm, 1 woman with MUAC of 24 cm, 4 women with MUAC of 25 cm, 4 women with MUAC of 26 cm, 1 woman with MUAC of 27 cm, 4 women with MUAC of 28 cm, 1 women with MUAC of 30 cm, and 1 woman with MUAC of 32 cm; with Hb of 11 g/dl there were 2 women with MUAC of 20 cm, 2 women with MUAC of 21 cm, 4 women with MUAC of 22 cm, 5 women with MUAC of 24 cm, 5 women with MUAC of 26 cm, 2 women with MUAC of 28 cm, 2 women with MUAC of 29 cm, 2 women with MUAC of 30 cm, 3 women with MUAC of 32 cm, and 1 woman with MUAC of 33 cm; with Hb of 12 g/dl there were 2 women with MUAC of 22 cm, 1 woman with MUAC of 23 cm, 2 women with MUAC of 24 cm, 9 women with MUAC of 25 cm, 3 women with MUAC of 26 cm, 5 women with MUAC of 27 cm, 2 women with MUAC of 28 cm, 1 woman with MUAC of 30 cm, 2 women with MUAC of 31 cm; with Hb of 13 g/dl there were 1 woman with MUAC of 24 cm, 1 woman with MUAC of 25 cm, 6 women with MUAC of 26 cm, 1 woman with MUAC of 27 cm, 1 woman with MUAC of 28 cm, 1 woman with MUAC of 29 cm, 1 woman with MUAC of 30 cm, 1 woman with MUAC of 32 cm, and 1 woman with MUAC of 33 cm; with Hb of 14 g/dl there were 1 woman with MUAC of 24 cm, 1 woman with MUAC of 27 cm, and 1 woman with MUAC of 29 cm; with Hb of 15 g/dl there were 1 woman with MUAC of 24 cm, and 1 woman with MUAC of 27 cm.

Meanwhile, research conducted by Christianti, D. F. (2020) involving 200 pregnant women found that women who were underweight and had a low MUAC suffered from anaemia (55.5%).

5. Conclusion

This study revealed that the prevalence of anemia among pregnant women at the Medan Tuntungan Health Center in 2023 was 27.1%. The majority of cases occurred during the third trimester, highlighting the increasing risk of anemia with advancing gestational age. While good nutritional status was prevalent among the participants, the study found no significant correlation between nutritional status and anemia incidence, suggesting that other factors, such as education level, gravida status, and pregnancy spacing, might play critical roles.

Primigravida mothers exhibited the highest prevalence of anemia, potentially due to limited experience and knowledge regarding pregnancy care. Employment and educational status were also examined, but no statistically significant relationships with anemia incidence were identified. However, lower education levels and unemployment might indirectly contribute to the risk through factors such as inadequate dietary practices

and healthcare access.

This research underscored the need for targeted interventions to address anemia in pregnant women, especially in high-risk groups such as those in later gestational stages and first-time pregnancies. Future studies should explore other contributing factors and evaluate the effectiveness of preventive measures, including dietary supplementation and health education programs.

6. Data Availability Statement

The original contributions presented in the study are included in the article/supplementary material; further inquiries can be directed to the corresponding author.

7. Ethical Statement

This study was approved by the Research Ethics Committee of Universitas Sumatera Utara, and Sumatera Medical Journal (SUMEJ) is an open-access, peer-reviewed, electronic, international journal. This statement clarifies the ethical behavior of all parties involved in the act of publishing an article in Sumatera Medical Journal (SUMEJ), including the authors, the chief editor, the Editorial Board, the peer-reviewer, and the publisher (TALENTA Publisher Universitas Sumatera Utara). This statement is based on COPE's Best Practice Guidelines for Journal Editors.

8. Author Contributions

All authors contributed to the design and implementation of the research, data analysis, and finalizing the manuscript.

11. Conflict of Interest

The authors declare no conflict of interest.

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