JUKEKE Jurnal Kesehatan dan Kedokteran
OPEN ACCESS
JUKEKE Vol 5 No. 1 | February 2026 | ISSN: 2829-0437 (Print), ISSN: 2829-050X (online), Page 408-419

Overview of Hemoglobin Levels in Pregnant Women in the Working Area of Delitua Community Health Center in 2024

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Article History
Received : February 14, 2026
Accepted : February 19, 2026
Published : February 20, 2026
Available Online : February 20, 2026

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Cite This Article:
Grace Hanshella, Sinurat, S., & Siallagan, A. (2025). Overview of Hemoglobin Levels in Pregnant Women in the Working Area of Delitua Community Health Center in 2024. Jurnal Kesehatan Dan Kedokteran, 5(1), 408–419.

DOI:
https://doi.org/10.56127/jukeke.v5i1.2601

Abstract: Anemia during pregnancy remains a significant maternal health problem because it can increase the risk of complications for both mother and fetus. Operationally, anemia in pregnancy is defined as hemoglobin (Hb) levels below 11 g% in the first and third trimesters and below 10.5 g% in the second trimester. Local data are needed to describe the magnitude of the problem and to support strengthening screening and education services at primary healthcare facilities. **Objective:** This study aimed to determine the profile of hemoglobin levels among pregnant women in the working area of the Delitua Community Health Center in 2024. **Methods:** This study employed a descriptive quantitative design. The population consisted of 245 pregnant women based on Delitua Community Health Center data as of July 2024. A total of 31 respondents were selected using non-probability sampling, specifically convenience sampling. Data were collected using observation sheets and hemoglobin measurements with the EasyTouch GCHb device, and analyzed descriptively using frequency and percentage distributions. **Results:** Most respondents were in the late adulthood age group (48.4%), the majority were in the third trimester (77.4%), and most were multigravida (77.4%). The distribution of hemoglobin levels showed that 64.5% of pregnant women were classified as anemic. **Implications:** These findings highlight the need to strengthen routine Hb screening during pregnancy, improve adherence to iron (Fe) tablet consumption, enhance nutritional intake, and intensify structured education and counseling through Posyandu and antenatal care services to reduce anemia prevalence among pregnant women. **Originality/Value:** This study provides a localized profile of hemoglobin levels among pregnant women in the Delitua primary healthcare setting in 2024, offering context-specific evidence to support program planning, risk mapping, and evaluation of anemia prevention interventions at the primary care level.

Keywords: Pregnant Women; Anemia; Hemoglobin Levels.

INTRODUCTION

Pregnancy is a crucial phase of fetal development that triggers various physiological adaptations in the mother's body, including fluctuations in hemoglobin levels (Harna, 2020). Unfortunately, iron deficiency leading to anemia remains a global and national public health issue, reflecting economic status and potentially degrading the quality of human resources on a broad scale. The World Health Organization (WHO) notes that the global prevalence of anemia in pregnant women reaches 41.8%, with regional distributions

of 48.2% in Asia, 57.1% in Africa, 25.1% in Europe, and 24.1% in the Americas; developing countries account for the highest percentage at 35-75% compared to only 18% in developed nations (Lantu, Tendean, & Suparman, 2016). In Indonesia, the trend of these cases shows an alarming escalation; data from the Basic Health Research (Riskesdas) documented a surge in prevalence from 37% in 2013 to 48.9% in 2018. These cases predominantly occur in the adolescent and young adult age group (15-24 years) at 84.6%, followed by the 25-34 years age range at 33.7%, and 35-44 years at 33.6% (Wahyuningsih, 2023).

This nutritional emergency generally stems from inadequate nutrient intake, low availability of iron, and a lack of folic acid and vitamin B12 in the mother's body (Dai, 2021). A similar phenomenon is empirically reflected at the local primary healthcare level. Based on a report from the Delitua Community Health Center (Puskesmas Delitua) in July 2024, there were 245 pregnant women registered for antenatal care. Initial findings from a preliminary study at this location revealed a concerning clinical reality: 80% (4 out of 5) of pregnant women strongly indicated experiencing anemia, with hemoglobin levels below 11 g/dL. The high incidence rate in the field is often closely related to a lack of education and limited maternal health literacy regarding pregnancy nutrition (Simorangkir, 2022). Such indications of nutritional deficiency can actually be detected early through the measurement of Mid-Upper Arm Circumference (MUAC), where a figure below 23.5 cm serves as a strong indicator of Chronic Energy Deficiency (CED) risk due to minimal protein intake (Afriyanti, 2022).

Clinically, anemia during pregnancy is recognized as a serious threat that triggers a domino effect of maternal health complications. This nutritional deficiency state standardly classified when hemoglobin is less than 11 g/dL in the first and third trimesters, and less than 10.5 g/dL in the second trimester (Sulung, 2022) creates a "potential danger to mother and child" syndrome. Various literature affirms that disturbances in blood volume increase maternal vulnerability to incidents of abortion, infection, premature rupture of membranes, and antepartum hemorrhage. Furthermore, during the labor phase, a minimal supply of oxygen to the uterine muscle tissues can disrupt contractions (uterine inertia), prolong the first stage of labor, and trigger prolonged labor. Postpartum, mothers with a history of anemia also face the risk of delayed uterine shrinkage (uterine involution), are highly susceptible to postpartum hemorrhage, puerperal infections, and disruptions in breast milk production (Yuliawati & Veriyani, 2022).

Beyond endangering maternal safety, iron deficiency during gestation brings significant destructive impacts on fetal survival and development. A lack of this red blood cell-forming nutrient has been scientifically proven to be a primary trigger for Low Birth Weight (LBW) and premature birth (Harna, 2020). Other literature also highlights that these complications manifest in the threat of miscarriage, dystocia, and an increased risk of depression and severe hemorrhage during the puerperium (Sinaga, Simamora, & BR. Sitanggang, 2022). Fetal vulnerability to infection exposure due to low immunity is directly proportional to the increased mortality rate of mothers and infants (Sukmawati, 2021). The risk of structural abnormalities, particularly neural tube defects such as spina bifida, is highly prone to occur in the early trimester if neural formation fails to close perfectly due to iron deficiency anemia. These congenital anomalies ultimately trigger long-term complications in the form of motor dysfunction, orthopedic problems, and neurological system damage in children (Farhan & Dhanny, 2021).

Considering the fatal clinical impacts, various previous studies have focused on proving the high correlation between maternal anemia and obstetric emergency complications, particularly postpartum hemorrhage. Empirical evidence from Yasin's (2020) study at the Lenteng Community Health Center, Sumenep, revealed that 94.5% (17 individuals) of birthing mothers who experienced bleeding were diagnosed with a history of anemia. A relevant percentage trend was also published by Oktariza (2020), where out of the total observed sample, 67 birthing mothers (38.1%) suffering from anemia ended up with postpartum hemorrhage complications. Other clinical observations by (Rustandi, 2023) in a hospital setting further confirmed this phenomenon, noting that nearly half of the anemic pregnant respondents (47.5% or 19 individuals) experienced incidents of postpartum hemorrhage. This series of literary facts underscores a recurring pattern that demands early detection in every healthcare facility.

Given the high prevalence of anemia both nationally and on a micro-scale within the observation area, this phenomenon requires immediate intervention. The proportion of pregnant women indicated with anemia in the preliminary survey, reaching 80%, serves as a compelling argument, indicating a real gap in the fulfillment of maternal nutritional status and the effectiveness of basic health education in the field. If intensive monitoring is not conducted, this condition has a massive potential to increase maternal and child morbidity rates in the future. Therefore, based on the urgency of the social problem and the clinical concerns outlined, this study specifically aims to determine and analyze the "Overview of

Hemoglobin Levels in Pregnant Women in the Working Area of the Delitua Community Health Center in 2024".

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RESEARCH METHOD

This research employs a quantitative approach utilizing an observational design with a descriptive-correlational framework. This specific design was selected as the most appropriate method to objectively identify, measure, and numerically analyze the degree of empirical relationships among the investigated variables within the target population.

This research employs a quantitative approach utilizing an observational design with a descriptive-correlational framework. This specific design was selected as the most appropriate method to objectively identify, measure, and numerically analyze the degree of empirical relationships among the investigated variables within the target population.

The primary data source comprises the population of TB patients actively undergoing medical treatment at the Special Lung Hospital, Medan, in 2024. Cumulatively, secondary data retrieval indicates a total of 327 registered patients during the period from January to June 2024. Based on this accumulation, the estimated average monthly patient intervention rate is approximately 54 individuals.

Primary data collection was conducted comprehensively utilizing structured questionnaire instruments derived from established scientific literature. To evaluate the parameters of the knowledge variable, the researchers adopted a standardized measurement tool developed by Nugroho P. (2020). Concurrently, the variable assessing patient actions (practices) was measured using a validated questionnaire referenced from the study by

Statistical data processing was executed in two sequential phases. The initial phase involved univariate analysis, aimed at presenting the characteristics of each variable through frequency distributions and percentages. The subsequent phase utilized bivariate analysis to examine the significance of the correlation between the variables. Based on the characteristics of the data distribution, hypothesis testing was conducted using Fisher's Exact Test. The computational results yielded a probability value (p-value) of 0.012 ($p < 0.05$), which statistically affirms the presence of a significant relationship.

RESULT AND DISCUSSION

The empirical findings derived from this investigation are systematically presented as follows:

Demographic Characteristics

The respondents in this study consisted of 31 pregnant women in the working area of the Delitua Community Health Center in 2024.

Table 1. Frequency Distribution and Percentage of Respondent Characteristics

Characteristics	Frequency (f)	Percentage (%)
Age		
Late Adolescence: 17-25 years	2	6,5
Early Adulthood: 26-35 years	14	45,2
Late Adulthood: 36-45 years	15	48,4
Total	**31**	**100**
Gestational Age		
TM II	7	22,6
TM III	24	77,4
Total	**31**	**100**
Gravidity		
Primigravida	7	22,6
Multigravida	24	77,4
Total	**31**	**100**

Based on the table above, the data obtained from the 31 respondents indicates that the highest proportion falls within the late adulthood category, comprising 15 individuals (48.4%). Furthermore, the majority of the respondents are in their third trimester of gestation, accounting for 24 individuals (77.4%), and are classified as multigravida, totaling 24 individuals (77.4%).

Table 2. Frequency Distribution of Hemoglobin Levels in Pregnant Women

Hemoglobin Level	Frequency (f)	Percentage (%)
< 11g% (Anemia)	20	64,5
>11g% (Not Anemia)	11	35,5
Total	**31**	**100**

Based on the table, the data reveals that the hemoglobin levels among pregnant women in the working area of the Delitua Community Health Center in 2024 are predominantly low, with a majority of 20 individuals (64.5%) categorized as anemic.

DISCUSSION

Overview of Respondent Characteristics

The characteristics of the respondents, as derived from the research findings and presented in Table 1 based on data from 31 respondents, indicate that the majority of the respondents are in the late adulthood category, comprising 15 individuals (48.4%). Regarding gestational age, the majority of respondents were in their third trimester, amounting to 24 individuals (77.4%). Based on pregnancy status, the majority of respondents had multigravida pregnancies, totaling 24 individuals (77.4%). The results of this study demonstrate that pregnant women in the high-risk age category of late adulthood (36-45 years) accounted for 15 individuals (48.4%), while pregnant women in late adolescence (17-25 years) accounted for 2 individuals (6.5%), and those in early adulthood (26-35 years) comprised 14 individuals (45.2%).

The researcher assumes that the majority of respondents fall into the late adulthood category because they are indeed multigravida, experiencing their second, third, or even fifth pregnancy. This is due to the fact that several respondents had experienced miscarriages and intrauterine fetal death. Pregnancies under the age of 20 and over the age of 35 carry a risk of developing anemia. At ages below 20, unstable biological and emotional conditions tend to result in insufficient attention to nutritional needs during pregnancy. Meanwhile, pregnancies over the age of 35 are often associated with decreased immune system function and an increased risk of disease (Hadi, 2024).

This study is relevant to the research conducted by Adamdi (2021), which stated that pregnancy risks in women aged < 20 years will lead to anemia, inadequate nutritional intake, preeclampsia, and eclampsia, which can result in maternal and infant mortality. Unprepared couples at this age are prone to abortion, and women who marry at < 20 years face a doubled risk of developing cervical cancer. In line with the study by Wahyuningsih (2023), it was shown that anemia in pregnant women frequently occurs at the ages of < 20 years and > 35 years because the demand for iron increases during pregnancy to support the growth and development of the fetus and placenta, as well as to increase the mother's red blood cell mass. At ages over 35, the body begins to enter a degenerative phase, causing suboptimal organ function and susceptibility to health disorders. Therefore, pregnancies in both of these age ranges carry a high risk of anemia.

The results of the study revealed that out of 31 pregnant women, 7 individuals (22.6%) had primigravida parity, while 24 individuals (77.4%) had multigravida parity. A parity of

more than four times can elevate the risk of pregnancy and delivery complications, such as intrauterine fetal death and pre- or postpartum hemorrhage. This condition is caused by damage to the blood vessels and vascularization of the uterine wall due to previous deliveries, which can disrupt blood flow to the placenta and hinder the distribution of nutrients to the fetus (Sjahrani, 2019).

Consistent with the research by (Qomarasari, 2023), the findings highlight the anemia status in pregnant women. Excessively frequent deliveries can increase blood plasma volume. A history of giving birth more than four times poses a risk of causing serious complications, including hemorrhage, which can trigger anemia during pregnancy. In line with the study by (Tunggal, 2024), parity is a primary factor in the occurrence of anemia. A parity of > 4 carries a high risk of experiencing anemia; this is because a high parity number can affect the mother's health condition, making her prone to anemia in subsequent pregnancies if her nutritional intake is not adequately maintained, as nutrients during pregnancy are shared between the fetus and the pregnant mother.

Based on the research findings, among the 31 pregnant women, those with high-risk parity were mothers with a parity of > 4 (multigravida). This can occur because the mothers have given birth frequently and lack sufficient attention to consuming proper nutrition in subsequent pregnancies. The results of this study indicated that the majority of the pregnant women were in their third trimester of gestation, comprising 24 pregnant women (77.4%). During pregnancy, the mother's body undergoes physiological changes to support fetal growth and development as well as preparation for labor, including alterations in the cardiovascular system. Blood plasma volume increases significantly and reaches its peak in the third trimester, particularly at 34 weeks of gestation, alongside the increase in fetal weight. The imbalance between the increase in plasma and red blood cells can lead to hemodilution, which is characterized by hemoconcentration, decreased hematocrit, and a reduced erythrocyte count (Tri Aksari, 2022).

Overview of Hemoglobin Levels in Pregnant Women

Based on the research findings at the Delitua Community Health Center utilizing the EasyTouch GCHb hemoglobin meter, the data indicates that a significant proportion of the respondents were categorized as anemic, comprising 20 pregnant women (64.5%), while 11 pregnant women (35.5%) were categorized as non-anemic.

The researcher posits that the occurrence of anemia among pregnant women at the

Delitua Community Health Center is primarily attributed to the respondents' limited comprehension regarding the critical role of iron and maternal nutritional intake during pregnancy. This assumption is corroborated by several respondents who admitted to not routinely consuming the supplements provided by healthcare workers during Integrated Healthcare Center (Posyandu) visits. Furthermore, the respondents demonstrated a lack of motivation to attend the Posyandu unless they experienced specific health complaints. Additionally, the respondents felt that their multigravida status reduced their interest in actively participating in the Posyandu programs.

The findings of this study align with the research conducted by (Sikoway, 2020), which asserts that hemoglobin levels are influenced by various factors, including the consumption of iron supplements and iron-rich foods. In the aforementioned study, the majority of subjects with low hemoglobin levels did not consume iron supplements. The administration of supplements such as ferrous sulfate, coupled with the intake of iron-rich foods, constitutes an effective measure in the management of iron deficiency anemia, particularly for high-risk individuals.

Furthermore, Dina Mariana et al. (2018), as cited in (Minasi, 2021), stated in their research that an unhealthy dietary pattern can precipitate anemia. Anemia in pregnant women is closely associated with an elevated risk of both maternal and infant morbidity and mortality, encompassing incidences such as stillbirth, miscarriage, premature delivery, and Low Birth Weight (LBW). The most prevalent type of anemia is triggered by iron (Fe) deficiency, widely recognized as iron deficiency anemia.

Similarly, an observational study conducted by (Simorangkir, 2022) at the Helen Tarigan Clinic in 2021 demonstrated that pregnant women with mild anemia amounted to 9 individuals (45%), while 7 individuals (35%) were non-anemic, 3 individuals (15%) had moderate anemia, and 1 individual (5%) suffered from severe anemia. The anemia commonly encountered during pregnancy is iron deficiency anemia, which is primarily caused by inadequate nutritional intake, malabsorption, impaired nutrient utilization, or hemorrhage.

This research is also consistent with the findings of (Fasiha, 2023), which defined anemia as a hemoglobin level of < 11 g/dL. This condition precipitates a deficiency of nutrients and oxygen within the placenta, potentially impairing fetal placental function. Furthermore, a decline in hemoglobin levels in pregnant women can escalate the risk of intrapartum hemorrhage, while simultaneously predisposing the fetus to Low Birth Weight

(LBW).

According to (Erryca, 2022), preventive measures against anemia during pregnancy necessitate enhancing the knowledge of pregnant women and fostering attitudes that support a healthy lifestyle through comprehensive education regarding the importance of adequate nutritional intake. Such information can be disseminated during Antenatal Care (ANC) examinations, which, under normal conditions, are recommended to be conducted a minimum of six times throughout the gestation period. The consumption of at least 90 iron tablets, the evaluation of hemoglobin levels at the onset and conclusion of pregnancy, and prompt medical consultations upon the emergence of unusual symptoms are highly recommended. In addition, the capacity of the family and the mother to select and prepare nutritious foods must be improved, supported by the provision of optimal health and nutritional services

CONCLUSION AND RECOMMENDATIONS

Conclusion

Based on the results of the research regarding the hemoglobin levels of pregnant women in the working area of the Delitua Community Health Center in 2024, which involved 31 respondents, it can be concluded that:

1. The majority of the respondents were in the late adulthood age range of > 35 years, comprising 15 individuals (48.4%). Regarding gestational age, the majority of respondents were in the third trimester, amounting to 24 individuals (77.4%), and the majority of pregnancies were multigravida, totaling 24 individuals (77.4%).
2. The hemoglobin levels among pregnant women at the Delitua Community Health Center in 2024 predominantly fell into the < 11 g% (Anemia) category, accounting for 20 respondents (64.5%).

Recommendations

1. For the Delitua Community Health Center

   It is recommended that the institution continuously coordinate pregnant women to undergo routine hemoglobin level examinations during Integrated Healthcare Center (Posyandu) visits. Healthcare workers, in collaboration with health cadres (kader kesehatan), should actively educate pregnant women on the critical importance of monitoring hemoglobin levels during pregnancy.

2. For Pregnant Women

   Pregnant women are strongly advised to routinely attend the Posyandu, monitor their hemoglobin levels throughout their pregnancy, diligently consume iron (Fe) tablets, and ensure adequate nutritional intake. Furthermore, they should actively seek information and participate in health education or counseling sessions regarding maternal and fetal health during pregnancy.

3. For the Educational Institution (STIKes Santa Elisabeth Medan)

   The findings of this study can serve as a comprehensive source of information and provide valuable recommendations for understanding hemoglobin levels in pregnant women. Additionally, it is hoped that the research location can serve as a fostered clinical practice site for the students of STIKes Santa Elisabeth Medan, particularly in the field of maternity nursing practice.

4. For Future Researchers

   This research can be utilized as a foundational reference to further identify and analyze the specific factors influencing the incidence of anemia among pregnant women.

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