

## CHARACTERISTICS OF HEMOGLOBIN LEVELS IN PREGNANT WOMEN FROM PRIMARY HEALTH CARE IN INDONESIA

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**Abstract:** Pregnancy is a period that really determines the quality of human resources and the future, because the growth and development of children is very much determined by the condition of the fetus in the womb. One of the factors that affect maternal health is the nutritional status of the mother during pregnancy. Hemoglobin is a component of red blood cells that functions to distribute oxygen throughout the body. Reduced hemoglobin causes anemia. Based on the research objectives described in the previous chapter, this type of research is descriptive observational with a cross-sectional approach to evaluate hemoglobin features in pregnant women on UPTD Puskesmas Kasiyan. Data analysis was performed using a data processing program (Microsoft excel). Starting with univariate analysis to obtain a descriptive distribution of respondents' characteristics and used to assess the percentage of various descriptions of hemoglobin levels of pregnant women against maternal age, gravida, parity, gestational age and body mass index. Based on the characteristics of respondents at the Kasiyan Health Center with the highest normal hemoglobin levels in the productive age group as many as 131 people, based on gravida normal hemoglobin levels in multigravida as many as 96 people, based on normal hemoglobin parity in primiparas as many as 60 people, based on gestational age the highest normal hemoglobin levels in in the second trimester as many as 66 people, and based on nutritional status according to body mass index, the highest normal hemoglobin level in normal nutrition was 81 people

**Keyword :** Anemia, Pregnancy, Hemglobin, Parity, Gravida

### I. INTRODUCTION

In the implementation of health efforts, mothers and children are family members who need to get priority. Therefore, efforts to improve maternal and child health receive special attention. Assessment of the health status and performance of maternal health efforts is important for monitoring. This is because the Maternal Mortality Rate (MMR) is one of the sensitive indicators in describing the welfare of society in a country (Noviana, 2019).

High risk pregnant women (RisTi) or complications are conditions that deviate from normal for pregnant women which can directly cause illness and death for both mother and baby. The reported maternal mortality rate until 2019 is still high, at 305 per 100,000 live births (KH), the target of the Sustainable Development Goals (SDGs) is less than 70 per 100,000 KH (Sagena. Sali, 2019). According to the results of the Indonesian Demographic and Health Survey (IDHS) in 2017, the Infant Mortality Rate (IMR) in Indonesia is still high at 24 per 1,000 live births (KH), but it is hoped that it will decrease according to the target to 15 per 1,000 KH in 2024 (Ministry of Health). RI, 2020).

Pregnancy is a period that really determines the quality of human resources and the future, because the growth and development of children is very much determined by the condition of the fetus in the womb. One of the factors that affect maternal health is the nutritional status of the mother during pregnancy. Hemoglobin is a component of red blood cells that functions to distribute oxygen throughout the body. Reduced hemoglobin causes anemia (Wahyuni, E. 2020).

Age is an important part of reproductive status. Age is related to the increase or decrease in body functions so that it affects a person's health status. One study states that adolescent women who are pregnant for the first time and women who are pregnant at the age of 30-35 years have a very high risk of developing anemia (Siregar, N. 2019).

The Health Profile of the Jember District Health Office in 2020 reported as many as 61 cases of maternal deaths with 22 maternal deaths, 9 maternal deaths and 30 postpartum maternal deaths. The Infant Mortality Rate in 2020 was recorded at 9.2 per 1,000 KH. Based on data on the number of births and deaths of children under five, there were 324 cases of infant mortality (Profile of the Jember Health Service, 2020). Pregnant women are generally iron-deficient so that they only give the fetus a small amount of iron needed for normal iron metabolism. Furthermore, it will become anemia when the maternal hemoglobin level drops below 11 g/dl during the third trimester. Decreased hemoglobin levels that afflict pregnant women have a negative impact on the fetus in the womb and the mother in pregnancy, childbirth and the postpartum period which among others will cause fetal death in the womb, abortion, congenital defects, low birth weight (LBW), premature babies, bleeding. postpartum in the mother, prolonged labor and shock and reduced iron stores in pregnant women (Sikoway, S. 2020).

The factor of the age of pregnant women and the distance of pregnancy, is closely related to the incidence of anemia in pregnant women. The age of the mother who is not in a healthy reproductive state where the pregnancy is 35 years, the high and the birth spacing is too fast can be the cause of anemia. As in general, pregnant women are obliged to check their pregnancy to an obstetrician or midwife. Based on nutritional status (BMI) shows body mass index (BMI) obesity category is more dominant, where obesity in mild anemia is 12 people (20%) and severe anemia is 20 people (33.3%) (Astania, S. 2021).

UPTD. Kasiyan Health Center is one of fifty health centers under the auspices of the Jember District Health Office. UPTD location. Kasiyan Health Center is located in the southern part of Jember, precisely in Puger District. From the data owned by the Kasiyan Health Center, it was recorded that high-risk pregnant women in the last 3 years starting in 2019, 2020 and 2021 were 229 cases, 245 cases and 157 cases. Maternal death reported in 2020 was 1 case caused by a confirmed case of COVID-19. The reported infant deaths in 2020 and 2021 were 11 cases and 8 cases, respectively. The causes of death in infants include premature, Intra Uterine Fetal Death (IUFD), asphyxia, and low birth weight (low birth weight < 2500 g).

Changes that occur when the mother is declared pregnant are the addition of body fluids or plasma volume that is not proportional to the addition of red blood cell mass, resulting in blood thinning, resulting in decreased hemoglobin levels and results in anemia in pregnancy. Hemoglobin is a substance that functions to transport oxygen to all body tissues, including to the body of the fetus in the womb by the mother, so that if anemia occurs in pregnant women, the process of transporting oxygen throughout the body will be disrupted (Utari, K. 2021).

Anemia that is not treated immediately is very risky in mothers and babies because it will affect pregnancy, childbirth and the puerperium. The effects of anemia include miscarriage, premature labor, prolonged labor, fetal death in the womb, shock, afribronogenemia and hypofibrinogenemia, intra-partum infection and weak mothers in the puerperium until anemia gravis occurs, which in turn will increase maternal and infant morbidity and mortality. Lumban Gaol, E. P. 2022).

A cohort study conducted by Arif Sabta, et al, with the title of anemia prevalence and factors related to pregnant women, found that the prevalence of anemia was 61.90%. The mean hemoglobin concentration was  $10.56 \pm 1.41$  g/dL. The prevalence of moderate and mild anemia was 34% and 27%, respectively. (Arif Sabta, et al, 2020). According to the research of Witri Hastuti, et al, a total of 73 pregnant women found that 47 (64.40%) respondents experienced anemia during pregnancy, while 26 respondents (35.6%) did not experience anemia (Witri Hastuti, et al, 2019). Therefore, the authors are interested in making a research report entitled Overview of Hemoglobin Levels in Pregnant Women at UPTD. Puskesmas Kasiyan, Puger District.

## II. RESEARCH METHODOLOGY

Based on the research objectives described in the previous chapter, this type of research is descriptive observational with a cross-sectional approach to evaluate hemoglobin features in pregnant women.

### 2.1 Population and Sample

The population is all the objects under study whose characteristics will be estimated or estimated (Nasir, 2011). The population in this study were all pregnant women who visited in January - June 2022 at UPTD.Puskesmas Kasiyan, Puger District, Jember Regency. The samples in this study were all medical record data of pregnant women who were examined for hemoglobin from January to June 2022. The sampling technique used is purposive sampling, which is the selection of samples based on characteristics or simple random from the total number of pregnant women recorded in the medical records of laboratory examination results at the Kasiyan Health Center, Jember Regency. The criteria determined by the researchers are as follows:

Inclusion Criteria	Exclusion criteria
Files of medical records of pregnant women who were checked for hemoglobin	Files of pregnant women who were not tested for hemoglobin
Medical record file January to June 2022	

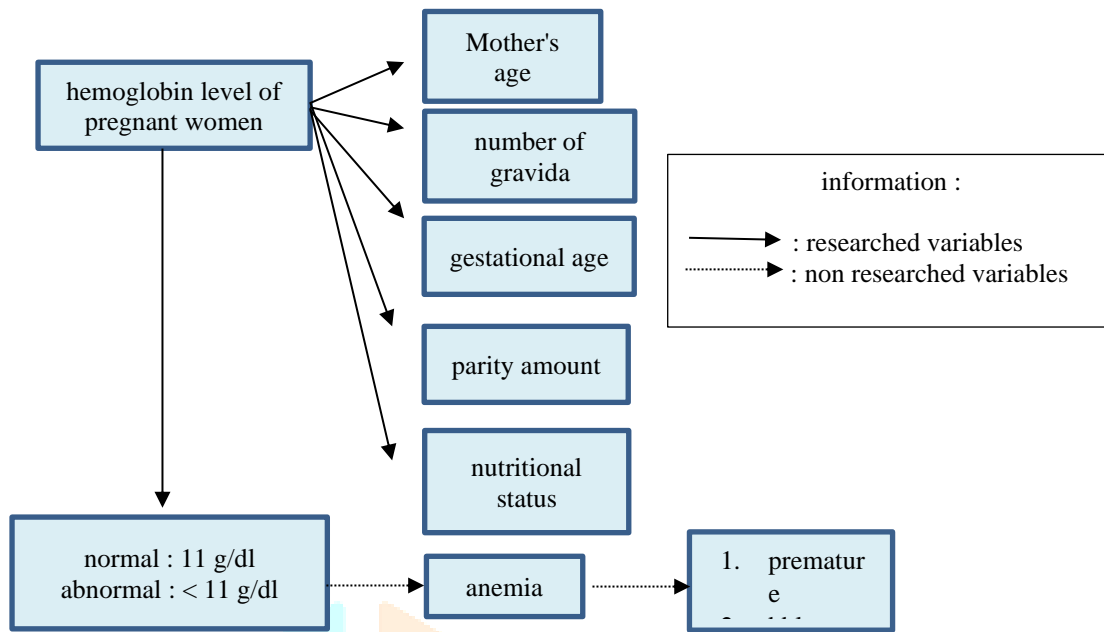
### 2.2 Data and Sources of Data

Data collection is done by using qualitative data observation methods and will then be converted into quantitative data in the form of numbers. Materials or data come from medical records of pregnant women at UPTD. Puskesmas Kasiyan from January to June 2022. Data processing is a follow-up activity that is carried out after data is collected. These processing activities include:

1. Data Editing (Editing) begins with an examination of research instruments that have been filled in or provided examination results, re-checked, clarified and corrected if there are errors so as to produce correct and accurate data.
2. Data Coding (Coding) is the process of clarifying the data obtained from the editing stage. Clarification of data can be in the form of giving a symbol directly to the answer or taking the essence of the answer that has been given, grouping it through certain categories, then giving a symbol or it can be presented in the form of tabulation of data in the form of a frequency distribution table and percentage.
3. Entering Data (Entry) After being coded correctly, then the data is entered into a table or data processing system. Entering data must be done according to certain rules or arrangements. Data compilation activities are organizing data in such a way that they can be easily added, compiled and arranged so that they can then be presented and analyzed.
4. Data Cleaning After all data is entered, it needs to be checked again to see the possibility of typing errors, coding errors, incompleteness and so on.

### 2.3 Theoretical framework

Conceptual framework, also called thinking framework, is the rationale for research formulated from facts, observations and literature review (Saryono, 2013). Based on the background and theory described in the previous section, the following conceptual framework is prepared:



**2.4 Statistical tools and econometric models**

Data analysis was performed using a data processing program (Microsoft excel). Starting with univariate analysis to obtain a descriptive distribution of respondents' characteristics and used to assess the percentage of various descriptions of hemoglobin levels of pregnant women against maternal age, gravida, parity, gestational age and body mass index. Then the data will be presented in the form of tables and graphs to determine the proportion of each variable to be studied. The form of interpretation of the results is divided into 2 decisions, namely the hemoglobin picture of normal pregnant women (not anemic) with a value of 11 g/dL while the abnormal (anemia) has a hemoglobin value of <11 g/dL.

**III. RESULTS AND DISCUSSION**

The research was conducted at UPTD. Kasiyan Health Center, Puger District, Jember Regency. This research is based on medical record data of pregnant women who check hemoglobin levels from January to June 2022. The results of the research on the characteristics are presented in the following table :

**1. Frequency Distribution of Pregnant Women's Hemoglobin Levels**

The results of the research on the percentage of hemoglobin levels for pregnant women can be seen in the table below:

No	Result	Sample amount (F)	Percentage (%)
1.	Normal	158	79,4
2.	Abnormal	41	20,6
Total		199	100

Based on table 5.1, 159 respondents (79.9%) had normal hemoglobin levels 11 g/dL and 40 respondents (20.1%) had abnormal hemoglobin levels <11 g/dL. This result illustrates if the respondent is not anemic.

**2. Frequency Distribution of Pregnant Women**

The results of the research on the percentage of pregnant women's age can be seen in the table below:

No	Result	Sample amount (F)	Percentage (%)
1.	Too young	10	5,0
2.	Productive	166	83,4
3.	Too old	23	11,6
Total		199	100

Berdasarkan tabel

5.2 didapatkan 10 responden (5,0 %) memiliki terlalu muda, kemudian profil responden sebanyak

Based on the table above, 166 people (83.4%) are of productive age and 23 respondents (11.6%) are too old. This result can be concluded if the average citizen in the working area of the Kasiyan Health Center knows about the optimal period of education for pregnancy.

### 3. Gravida Frequency Distribution of Pregnant Women

The results of the research on the percentage of maternal gravida can be seen in the table below:

No	Result	Sample amount (F)	Percentage (%)
1.	Primigravida	78	39,2
2.	Multigravida	118	59,3
3.	Grandemultigravida	3	1,5
Total		199	100

Based on table 5.3 obtained 78 respondents (39.2%) with primigravida, as many as 118 respondents (59.3%) with multigravida and 3 respondents (1.5%) had a grandemultigravida profile. This refers to the level of productive age of pregnant women and knowledge about family planning that has not been maximized.

### 4. Distribution of Parity Hemoglobin Frequency for Pregnant Women

The results of the mother's percentage parity research can be seen in the table below:

No	Result	Sample amount (F)	Percentage (%)
1.	Nullipara	78	39,2
2.	Primipara	76	38,2
3.	Multipara	45	22,6
Total		199	100

Based on table 5.4, 78 respondents (39.2%) described pregnant women who had never given birth, 76 respondents (38.2%) described pregnant women who had given birth once, and 45 respondents (22.6%) described pregnant women who give birth to two or more viable fetuses.

### 5. Frequency Distribution of Pregnant Women's Gestational Age

The results of the research on the percentage of pregnant women's gestational age can be seen in the table below:

No	Result	Sample amount (F)	Percentage (%)
1.	Trimester I	55	27,6
2.	Trimester II	83	41,7
3.	Trimester III	61	30,7
Total		199	100

Based on table 5.5, 55 respondents (27.6%) with gestational age in the first trimester, 83 respondents (41.7%) with gestational age in the second trimester and 61 respondents (30.7%) with gestational age in the third trimester.

### 6. Statistical distribution by IMT

The results of the research on the percentage of BMI in pregnant women can be seen in the table below:

No	Result	Sample amount (F)	Percentage (%)
1.	Malnutrition	11	5,5
2.	Normal nutrition	100	50,3
3.	Overweight	64	32,2
4.	Obesity	24	12,0
Total		199	100

Based on table 5.6 obtained 11 respondents (5.5%) with poor nutritional status, as many as 100 respondents (50.3%) with normal nutritional status, as many as 64 respondents (32.2%) with excessive nutritional status, and as many as 24 respondents (12.0%) with obesity nutritional status.

### 7. Cross tabulation of respondent characteristics with hemoglobin levels

The following is the result of cross tabulation between respondent characteristics and hemoglobin levels in pregnant women at UPTD. Puskesmas Kasiyan, Puger District.

characteristic	Result	Hb amount				Total	
		Normal		abnormal			
		Sample amount (F)	Percentage (%)	Sample amount (F)	Percentage (%)	Sample amount (F)	Percentage (%)
Age	Too young	9	6%	1	2%	10	5%
	Productive	131	83%	35	85%	166	83%
	Too old	18	11%	5	12%	23	12%
	Total	158	100,0%	41	100%	199	100%
Gravida	Primigravida	60	38%	18	44%	78	39%
	Multigravida	96	61%	22	54%	118	59%
	Grandemultigravida	2	1%	1	2%	3	2%
	Total	158	100,0%	41	100%	199	100%
Parity	Nullipara	60	38%	9	22%	69	35%
	Primipara	60	38%	17	41%	77	39%
	Multipara	38	24%	15	37%	53	27%
	Total	158	100%	41	100%	199	100%
Age of pregnancy	Trimester I	46	29%	9	22%	55	28%
	Trimester II	66	42%	17	41%	83	42%
	Trimester III	46	29%	15	37%	61	31%
	Total	158	100%	41	100%	199	100%
IMT	Malnutrition	9	6%	2	5%	11	6%
	Normal nutrition	81	51%	19	46%	100	50%
	Malnutrition	49	31%	15	37%	64	32%
	Obesity	19	12%	5	12%	24	12%
Total	158	100%	41	100%	199	100%	

Table 5.7 is based on the age characteristics of pregnant women with the highest normal hemoglobin levels at the age of 20-34 years with a total of 131 people (83%). Based on gravida, the most multigravida with a total of 96 people (61%). Based on parity, nullipara and primipara with a total of 60 people (38%). Based on gestational age, most were in the second trimester with a total of 66 people (42%). Based on the nutritional status of pregnant women based on BMI, the most were pregnant women with normal nutrition with a total of 81 people (51%).

### IV. CONCLUSION

Based on the description of the research results obtained as many as 199 pregnant women, and according to the discussion above, conclusions can be drawn from research on the picture of hemoglobin (Hb) in pregnant women at UPTD. Puskesmas Kasiyan Puger District, namely:

1. Hemoglobin levels of pregnant women in Kasiyan Health Center are mostly normal compared to abnormal hemoglobin levels.
2. The total number of pregnant women at Kasiyan Health Center with hemoglobin levels 11 g/dL was 158 people (79.4%).
3. The total number of pregnant women at Kasiyan Health Center with abnormal hemoglobin levels <11 g/dL was 41 people (20.6%).
4. Based on the characteristics of respondents at the Kasiyan Health Center with the highest normal hemoglobin levels in the productive age group as many as 131 people, based on gravida normal hemoglobin levels in multigravida as many as 96 people, based on normal hemoglobin parity in primiparas as many as 60 people, based on gestational age the highest normal hemoglobin levels in in the second trimester as many as 66 people, and based on nutritional status according to body mass index, the highest normal hemoglobin level in normal nutrition was 81 people

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