



# The Characteristics of Pregnant Women with Anemia at Puskesmas Sanden in 2022-2023

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## ABSTRACT

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Anemia in pregnancy is a public health problem, especially in developing countries, and is associated with adverse pregnancy outcomes. The prevalence of anemia in Indonesia is relatively high. In 2018, the prevalence of anemia reached 32%. While the prevalence of anemia in pregnant women was 48.9% in the same year. Reducing the incidence of anemia in pregnant women is included in efforts to reduce maternal mortality (MMR) and morbidity or mortality in babies born. Puskesmas Sanden has a program to reduce MMR and infant mortality with one of the efforts made to reduce the number of anemias in pregnant women. The purpose of this study was to determine the prevalence and characteristics of pregnant women who experience anemia in the working area of Puskesmas Sanden. This research was conducted using a descriptive method. The data were taken from secondary data, namely register data for pregnant women who carried out examinations at the Mother and Child Health Polyclinic in Puskesmas Sanden. The research respondents were all pregnant women who experienced anemia from January 1<sup>st</sup>, 2022 to June 30<sup>th</sup>, 2023, in which, there were 120 research respondents. Research variables include the mother's age, number of parities, and upper arm circumference (UAC). The results showed that the prevalence of pregnant women pregnant women with anemia was 254 people. The characteristics of pregnant women who experience anemia based on age showed that there were 97 people (80.83%), pregnant women who experience anemia dominated by women aged 21-34 years old, while there are 3 (2.5%) pregnant women with anemia aged ≤ 20 years old, and 20 pregnant women with anemia aged ≥ 35 years (16.67%). Meanwhile, based on the number of parities, in this study, the total parity of all pregnant women who were included in the research respondents was ≤ 3, which were 120 people (100%), and none of the pregnant women who had parity > 3. Then, based on UAC, there were 94 (78.33%) pregnant women with anemia had more UAC ≥ 23.5 cm, and as many as 26 pregnant women with anemia had UAC < 23.5 cm (21.67%). The conclusion of this study is that the prevalence of pregnant women at Puskesmas Sanden is still relatively high, which is 39.69%.

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## INTRODUCTION

Anemia is the most common problem in the world, especially in developing countries. Although anemia is an easily treated and mostly preventable disease, it still continues to be a significant prevalence in pregnant women.<sup>1</sup> Anemia in pregnancy is a public health problem, especially in developing countries such as Indonesia, and is associated with adverse pregnancy outcomes.<sup>2</sup> It is related to maternal and perinatal mortality, premature delivery, low birth weight, and other adverse outcomes. According to the World Health Organization (WHO), the prevalence of anemia among pregnant women varies from 15% in developed countries to 33% -75% in developing countries.<sup>3</sup>

The prevalence of anemia in pregnancy in Indonesia is still relatively high, which is 48.9%.<sup>13</sup> The prevalence of pregnant women in Yogyakarta continued to increase from 2017 to 2021, starting from 14.35% in 2017; 15.21% in 2018; 15.69% in 2019; 15.84% in 2020; and 16.5% in 2021.<sup>14</sup> The prevalence of anemia in pregnant women in Bantul Regency ranks second highest, which is 54.8%.<sup>15</sup> This prevalence is classified as high because it exceeds the limit set by WHO which states that anemia is recognized as a public health problem if the prevalence is 5.0% or more. Meanwhile, the prevalence of anemia equal to or more than 40% in a population is classified as a severe public health problem.<sup>3</sup> Then, based on the report data from the Family Health Data Communication Information System, there were 88 pregnant women with anemia in 2021, 1 of them had Hb <8 g/dL, and the others had Hb levels of 8-11 g/dL. This number then decreased to 81 pregnant women with anemia in 2022, 76 of them had Hb between 8-11 g/dL, and 5 others had Hb <8 g/dL.<sup>28</sup>

Anemia in pregnancy is defined as a hemoglobin (Hb) concentration of less than 11 g/dL.<sup>1,2</sup> Anemia in pregnancy can be divided into mild, moderate, and severe anemia for hemoglobin levels of 10.0–10.9 g/dL, 7–9,9 g/dL, and <7 g/dL.<sup>1</sup> Pregnant women are prone to anemia because the need for iron increases several times during pregnancy to meet the increased demands of the fetus, increase the maternal erythrocyte mass, and compensate for the loss of iron during delivery.<sup>16</sup> Based on the Centers for Disease Control (CDC) anemia is defined as gestational hemoglobin of less than 11 g/dL (Hematocrit {Hct} 33%) in the first and third trimesters; and less than 10.5 g/dL (Hct 32%) in the second trimester. Anemia in pregnant women generally occurs due to iron deficiency.<sup>14</sup> Undiagnosed and untreated iron deficiency anemia can have a major impact on the health of the mother and fetus. Various studies have shown a relationship between

anemia and maternal mortality.<sup>1,2</sup>

Maternal Mortality Rate (MMR) is an important indicator in determining health status.<sup>4</sup> Maternal Mortality Rate has an important role in maternal health assessment programs and reflects the quality of maternal and child health services in an area. Maternal death refers to death due to complications from pregnancy or childbirth. MMR is calculated from the number of women who die from a cause of death related to pregnancy disorders or their treatment (excluding accidents, suicides, or incidental cases) during pregnancy, childbirth, and the postpartum period (42 days after delivery) without taking into account the length of pregnancy, per 100,000 live birth.<sup>5</sup>

Currently, MMR is still an important health problem in Indonesia, including in the Special Region of Yogyakarta (DIY).<sup>6</sup> Currently, MMR is still an important health problem. In the United States, MMR in 2021 was 32.9 deaths per 100,000 live births. It has increased compared to the rates of 23.8 deaths per 100,000 live births in 2020 and 20,1 deaths per 100,000 live births in 2019.<sup>7</sup> In 2020 the Indonesia MMR was 189 per 100,000 live births, and in Yogyakarta, it was 58 per 100,000 births.<sup>8</sup> Reducing MMR to less than 70 per 100,000 live births in 2030 is one of the efforts contained in the Sustainable Development Goals (SDGs).<sup>9</sup> Even though in 2020 Yogyakarta succeeded in reducing MMR to less than 70 cases per 100,000 live births, Puskesmas Sanden continues to innovate in organizing the *SARTIKA* program (*Sanden Guyub Rukun Tangani KEK dan Anemia*) which will be implemented in 2020 with the hope that it will become an example for other first-level health facilities to create reduction in MMR nationally.

Maternal mortality in developing countries is mostly related to anemia during pregnancy and is influenced by several factors such as low education level and low nutritional status including poor nutritional intake.<sup>11</sup> Chronic lack of nutritional intake will cause pregnant women to experience Chronic Energy Deficiency (CED). CED is defined based on body mass index (BMI) as  $<18.5 \text{ kg/m}^2$  or alternatively based on upper arm circumference which is  $<23.5 \text{ cm}$ .<sup>17</sup> Other risk factors that cause anemia in pregnant women are the mother's age, gestational age, and amount of parity.<sup>18,19</sup>

In addition to anemia having an impact on maternal health, anemia in pregnancy is associated with an increased risk of premature birth and low birth weight babies. Prematurity and LBW are still the main causes of neonatal death in developing countries which account for 30% of deaths.<sup>33</sup> It is also associated with an increased risk of Intrauterine Fetal Death (IUFD), low APGAR scores at 5 minutes, and Intrauterine Growth Restriction (IUGR) which are risks stunting in children less than two years old.<sup>34</sup>

Considering the increased number of pregnant women who experience anemia every year in Yogyakarta and the still high anemia in pregnant women in Bantul Regency, especially at

Puskesmas Sanden, hopefully, the SARTIKA program can be continued as an effort to reduce maternal mortality by reducing the number of anemias in pregnant women. Therefore, this research was conducted to support the SARTIKA program by understanding the characteristics found in anemia in pregnant women in the working area of Puskesmas Sanden, so that the health promotion efforts and anemia management can be carried out accordingly and the anemia reduction program in pregnant women can run optimally.

## METHODS

A descriptive method was employed in this research. The data were taken from secondary data, namely register data for pregnant women who carried out examinations at the Mother and Child Health Polyclinic of Puskesmas Sanden. The research respondents were all pregnant women who experienced anemia from January 1<sup>st</sup>, 2022 to June 30<sup>th</sup>, 2023, there were 120 respondents. This research is descriptive research using descriptive methods. The exclusion criteria used in this research were patients with incomplete medical records and residing outside the working area of Puskesmas Sanden. Researchers will record pregnant women with anemia in the working area of Puskesmas Sanden from January 1<sup>st</sup>, 2022 to June 30<sup>th</sup>, 2023 taking into account the mother's age, gestational age, number of parities, and upper arm circumference, the researchers put the patient data into a diagram which will be presented in the form of amounts and percentages.

## RESULT

### The Prevalence of Anemia in Pregnant Women for the period of January 1<sup>st</sup>, 2022 - June 30<sup>th</sup>, 2023

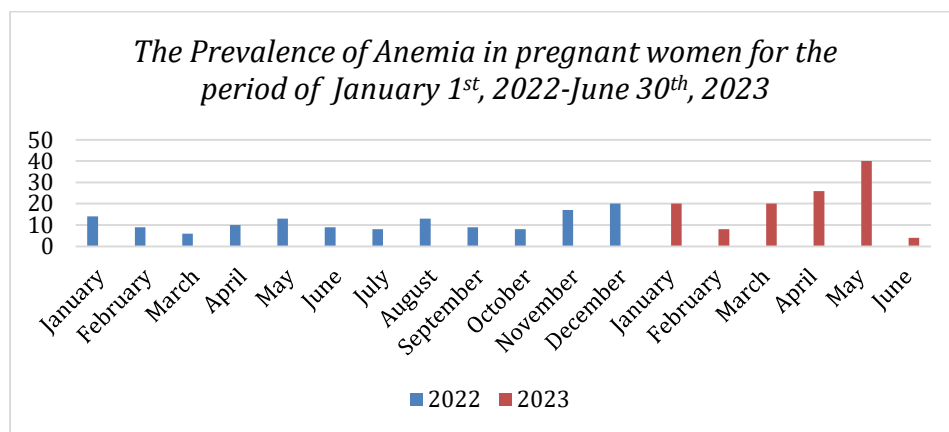


Figure 1. The Prevalence of Anemia in Pregnant Women for the period of January 1<sup>st</sup>, 2022-June 30<sup>th</sup>, 2023

In Figure 1 it can be seen that the prevalence of anemia in pregnant women from January 2022 to June 2023 has fluctuated. These cases were taken from new and old cases of Anemia in pregnant women based on the results of Hb examination during integrated ANC at Puskesmas

Sanden. The total number of cases of anemia in pregnant women from January 2022 to June 2023 were 254 cases. The graph shows that the highest cases occurred in May 2023 with a total of 40 cases and the lowest cases occurred in June 2023 with a total of 4 cases. The population of pregnant women from January 2022 to June 2023 was 640 people.<sup>28</sup> Based on the research results, the number of new and old cases of pregnant women with anemia was 254 people. Thus, the prevalence of pregnant women with anemia was 39.69% from January 2022 to June 2023.

### **The Characteristics of Anemia in Pregnant Women for the period of January 1<sup>st</sup>, 2022 – June 30<sup>th</sup>, 2023**

Table 1. The Characteristics of Anemia in Pregnant Women for the period of January 1<sup>st</sup>, 2022-June 30<sup>th</sup>, 2023

Variable	Frequency (n)	Percentage (%)
<b>Mother's Age</b>		
≤ 20 years old	3	2.5
21-34 years old	97	80.83
≥ 35 years old	20	16.67
<b>Number of parity</b>		
≤ 3	120	100
> 3	0	0
<b>Upper Arm Circumference</b>		
≥ 23.5 cm	94	78.33
< 23.5 cm	26	21.67

The characteristics of the research respondents listed in Table 1 showed that based on the age of pregnant women who experience anemia, it was dominated by women aged 21-34 years old, which were 97 people (80.83%), while there were 3 (2.5%) pregnant women with anemia aged ≤ 20 years old, and 20 pregnant women (16.67%) with anemia aged ≥ 35 years. Meanwhile, based on the number of parities, in this research, the total parity of all pregnant women who were included in the research respondents was ≤ 3, which were 120 people (100%), and none of the pregnant women who had parity > 3. Then, based on upper arm circumference, more pregnant women with anemia had upper arm circumference ≥ 23.5 cm, there were 94 people (78.33%), and as many as 26 pregnant women with anemia had upper arm circumference < 23.5 cm (21.67%).

## **DISCUSSION**

Based on Figure 1, the number of cases of anemia in pregnant women at Puskesmas Sanden showed a fluctuating graph, so that every month the number of cases was uncertain. However, it can be seen that the most cases occurred in May 2023 (40 cases), and the fewest cases occurred in June 2023 (4 cases). The number of pregnant women who experienced anemia in 2022 from January to December respectively was 14 cases, 9 cases, 6 cases, 10 cases, 13 cases, 9 cases, 7 cases, 13 cases, 9 cases, 8 cases, 18 cases, and 20 cases. Then in 2023, there were 20 cases, 8 cases, 20 cases, 26 cases, 40 cases, and 4 cases consecutively from January to June. In general, it can be seen that there were more cases of anemia in pregnant women in the first 6 months of 2023 compared to the first 6 months of 2022. It could be caused by several factors. The first possibility is that in fact, many pregnant women will experience anemia in 2023 compared to the previous year. The second possibility could be caused by more pregnant women being detected as having anemia compared to the previous year due to program evaluation of efforts to reduce anemia in pregnant women so that the data on anemia in pregnant women recorded in the register book would be more complete.

Talking about SARTIKA program at Puskesmas Sanden as an effort to reduce MMR, activities in the program include *PANDUYANKESRING*, which is an Integrated Antenatal Coverage involving network Health Services, *BUKTISARI*, Assistance for Pregnant Women with CED and Anemia from *UPK Lestari*, *KEMAS*, which is class of Sanden's bride and groom, and *EUREKA*, which is Education for Youth with CED and Anemia. The program aims to reduce maternal and infant mortality, including reducing the number of adolescents with CED and anemia.

One of the efforts to detect anemia in pregnant women is to ensure that pregnant women make visits to the first-level health facilities, namely the public health center. The minimum frequency of antenatal care (ANC) is six times. Looking at ANC coverage data in Bantul Regency, from 2018 to 2020, K4 coverage tends to decrease.<sup>25</sup> It may be related to the Covid-19 pandemic which has limited the visits of pregnant women to healthcare facilities. Then, in 2021 the ANC coverage chart increased again to 98.2% (2021) from 86.64% (2020). However, in 2022 this coverage decreased to 81.1%. It may be caused by pregnant women who lose contact at ANC visits, especially at K1, where one of the factors is the increase in the number of unwanted pregnancies, so they tend to hide their pregnancies.<sup>25</sup>

One of the programs that is directly related to pregnant women is the Integrated Antenatal Program which aims to identify and find pregnant women who are at risk, which is conducted by screening and routine examinations of pregnant women regularly and according to recommendations. The existence of the SARTIKA program can also ensure that all pregnant women receive Integrated Antenatal Care so that more and more pregnant women are detected having certain problems, such as anemia. Then, considering that the data in our study were taken

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based on secondary data only, it may cause the data we obtained to be incomplete therefore not all hemoglobin levels in all pregnant women were recorded so they were not recorded in our study.

One of the efforts made to reduce the prevalence of anemia is by administering 90 tablets of iron (Fe) during pregnancy.<sup>24</sup> Based on the Yogyakarta Province Health Profile data in 2022, the Coverage of Giving Blood Supplement Tablets (BST) to Pregnant Women in Bantul Regency is based on Health Center data in 2022, the coverage of iron supplements given at Sanden Public Health Center was 87.7%.<sup>25</sup> In the treatment and prevention of anemia, it is not always related to the range of iron supplements given, but also to the level of consumption of Fe in pregnant women. The high rate of anemia can also be associated with adherence to Fe consumption in pregnant women. The correct amount, the correct way of consuming it, and the frequency are several factors affecting the adherence of pregnant women to consuming Fe tablets.<sup>26</sup> In a study conducted by Handayani (2015), factors of boredom, forgetfulness and lack of support from the family are the reasons pregnant women do not adhere to taking Fe tablets.<sup>27</sup>

Pregnant women are prone to experiencing iron deficiency anemia due to the increased need for iron for themselves and the baby in their womb. The need for iron in general is 1,000 mg during pregnancy. Without supplementation such as iron tablets, a pregnant woman can lose iron stores in the bone marrow, decrease ferritin levels, and decrease hemoglobin levels by around 0.5 gr/dL in late pregnancy until she falls into a state of anemia.<sup>20</sup> Fatigue, pallor, tachycardia, dizziness, dyspnea, and changes in mood towards depression are some of the signs felt by pregnant women with anemia, these conditions can be found during pregnancy, the process of giving birth, and after giving birth.<sup>20</sup>

### **The Prevalence of Pregnant Women with Anemia by Age**

The characteristics of the respondents based on this research are in line with the research conducted by Chowdhury et al. (2015), which showed that the age of pregnant women who experience anemia is dominated by those aged > 25 years old than those who are younger. <sup>31</sup> In addition, another study explained that young mothers have a 56% higher risk of anemia. The young category in this study referred to pregnant women aged 21-35 years old. Likewise, Barroso et al. in England found that the likelihood of anemia was 96% higher in young mothers. As well as Briggs et al. state that adolescents ( $\leq 19$  years) are 2.5 times more likely to experience anemia than adults during 26 to 35 weeks of pregnancy and before delivery.<sup>36</sup> However, research conducted by Anzam and Inayati (2021) reports that maternal age is not significantly related to the risk of anemia.<sup>38</sup> Pregnant women who are younger tend to experience anemia which can be caused by lower plasma ferritin levels and iron stores in the body compared to adults which can

increase the risk of anemia in pregnancy.<sup>36</sup> The age group of 20-35 years old is the ideal age of pregnant women because at that age the mother has a smaller risk of pregnancy complications and has a healthy reproductive function. This is related to the biological and psychological conditions of pregnant women who are more stable and not vulnerable. Meanwhile, in the age group <20 years pregnant women are at risk of developing anemia because biological development, namely reproductive function, is not optimal. In addition, pregnancy in the age group over 35 years is a high-risk pregnancy, including being prone to anemia.<sup>18</sup>

In this study, fewer pregnant women who were aged  $\leq 20$  had anemia. It may be due to the fact that the nutrition of pregnant women less than 20 years old in the working area of Puskesmas Sanden has been fulfilled. Nutritious intake is needed by all pregnant women, especially for pregnant women who are still young or under 20 years old because this age is still classified as a teenager and their reproductive function is still not optimal compared to those at an older age. Adolescence is a phase where the body is still experiencing growth and development needed to achieve optimal function. Therefore, pregnant women in their teens need a lot of nutritious food intake to meet the needs of the fetus in their womb, as well as to meet their growth and development.<sup>39</sup> Then, the results of this study indicate that there is no tendency for pregnant women with anemia in the working area of Puskesmas Sanden who are older than 35 years old compared to those aged 21-34 years old, it may occur because the pregnant women already regularly consume iron tablets. Consumption of iron tablets regularly can help pregnant women's Hb levels remain in normal conditions, especially pregnant women aged 35 years old and above who are prone to anemia due to decreased body physiology. At this age, pregnant women who are aged 36 and above are more at risk.<sup>38</sup>

### **The Prevalence of Pregnant Women with Anemia based on Number of Parity**

Someone with a high parity number has a greater risk of anemia. It is due to increased susceptibility to bleeding. Although it is not known exactly what mechanism causes high parity conditions to increase the risk of bleeding, a study suggests that increased venous blood flow to the lower part of the uterus, hyalinization of blood vessels, and decreased elasticity of the uterine wall are the causes.<sup>27</sup> Hemodilution or blood dilution causes anemia in pregnancy. Physiologically, mothers with high parity will experience a greater increase in blood plasma volume, causing greater hemodilution. Mothers who have given birth more than 3 times are at risk of experiencing serious complications such as bleeding, it is influenced by the state of anemia during pregnancy. During pregnancy, iron reserves in the body will decrease, therefore the higher the frequency of



pregnancy, the more iron is lost, while the body needs time to restore iron levels to normal levels, therefore a mother needs to pay attention to the frequency and spacing of her pregnancies <sup>21</sup>.

Research conducted by Kusumah stated that mothers with parity >3 had a higher risk than mothers who experienced parity ≤3 times, with a p-value of 0.024.<sup>37</sup> In addition, other studies stated that pregnant women with a history of more than three pregnancies or multiparity could increase the risk of anemia by two times compared to pregnant women who are pregnant for the first to third time and the results of this study showed statistical significance (p=0.046) (SL et al., 2019).

In this study there was no parity > 3, it is possible that there were several pregnant women with parity > 3 but did not meet the criteria required by this study. In addition, maybe the population in the working area of Puskesmas Sanden has implemented the family planning program well so there were not many people who have children >2.

### **The Prevalence of Pregnant Women with Anemia Based on Upper Arm Circumference (UAC)**

Measuring a person's nutritional status can use BMI. Body Mass Index (BMI) is commonly used in assessing the nutritional status of adults, where CED status is stated if BMI <18.5. Currently BMI is considered the best indicator for assessing the nutritional status of adults because it uses two growth indicators, namely body weight (a measure of growth in tissue mass) and height (a measure of linear growth). However, there are several limitations to the BMI method for measuring nutritional status, which uses two tools, namely a scale and a stadiometer, so it is relatively expensive, and cannot be applied to infants, children, adolescents, pregnant women, the elderly and the general public who have difficulty of standing, such as a disabled person, paralyzed person, someone who is bed rested or stooped.<sup>29</sup> Although BMI is a complex measurement method, this method is not sensitive to body composition. A pregnant woman with a short height cannot be processed using this method, moreover, if the pregnant woman has a weight that is proportional to her height, it will not be detected as CED even though they have CED. While measurements using UAC can better detect CED in pregnant women with short height.<sup>29</sup>

Assessment of the nutritional status of pregnant women can be done using the UAC (upper arm circumference) measurement. Practical, inexpensive, simpler, and easy to use by non-professionals are the advantages of the UAC measurement in assessing the nutritional status of pregnant women.<sup>29</sup> The upper arm circumference reflects the levels of muscle tissue, subcutaneous fat, protein, and energy reserves which can indicate the risk of CED in pregnancy. Low UAC in pregnant women indicates inadequate protein availability, resulting in limited delivery of nutrients to the fetus. It can affect the growth and development of the fetus.<sup>30</sup> Pregnant

women are said to have CED if they have a threshold for measuring UAC  $<23.5$  cm.<sup>22</sup> In a study conducted by Suhardi & Fadila (2016) the risk of anemia in pregnant women is 2.9 times higher in pregnant women with poor nutritional status than good nutritional status.

CED in pregnant women can occur due to low awareness of the importance of the quantity and quality of food during pregnancy. In the first trimester, pregnant women often experience nausea or vomiting with decreased food consumption, meaning that the needs of the mother and fetus are not being met. Therefore, it is necessary to pay attention to integrated antenatal visits as well as efforts to educate the public as preventive promotive efforts that can be carried out early.<sup>32</sup>

In this study, UAC  $\geq 23.5$  cm was found more frequently than UAC  $<23.5$  cm. It is possible that pregnant women in the working area of Sanden Public Health Center have had their nutrition fulfilled by providing additional food intake.

## CONCLUSION

The conclusion of this study is that the prevalence of pregnant women at Puskesmas Sanden is still relatively high, which was 39.69%. The characteristics of pregnant women who experienced anemia in the working area of Puskesmas Sanden were aged 21-34 years old, had a parity number  $\leq 3$ , and had UAC  $\geq 23.5$  cm. Therefore, it is necessary to carry out preventive and promotive efforts for pregnant women in an effort to reduce the amount of anemia in pregnant women as has been done by SARTIKA program at Sanden Public Health Center, so the program still needs to be continued and developed for the better.

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