

The Identification of Maternal Characteristics and The Incidence of Anemia in Pregnant Women

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ABSTRACT

Aim: The research aims to identify maternal characteristics and anemia in third trimester pregnant women at Mantrijeron Primary Health Center of Yogyakarta.

Methods: The study employed a correlation design and *cross-sectional* approach. The sampling technique in this study used the *purposive sampling method* with the number of samples was 69 people—the data analysis used using chi-square analysis.

Results: This study shows correlations between education level, parity, maternal age, and the frequency of ANC visits as indicated by *p-value* (<0.05) and the incidence of anemia in the third trimester of pregnant women Mantrijeron Primary Health Center of Yogyakarta. Meanwhile, those with no correlation were nutritional status as indicated by *p-value* ($0.389 > 0.05$).

Conclusion: Pregnant women are suggested to have pregnancy checks regularly at least four times during pregnancy so that complications, such as anemia, can be indicated earlier and can be minimized.

Keywords: Characteristics; anemia in pregnant women

INTRODUCTION

Based on the Yogyakarta Municipality Health Office data in 2016, the prevalence of anemia in pregnant women was 16.09%; this data has increased from 2015 at 14.85%. The highest anemia prevalence in Yogyakarta Municipality was 22.78%. Judging from the data on anemia's incidence rate in Yogyakarta Municipality, Mantrijeron Primary Health Center was one of the health centers with the highest anemia incidence in 2017 at 32.80%. In 2016, anemic pregnant women reached 33.28%, although it declined 0.48%. These data indicate that it still requires more effort to overcome anemia in pregnant women since the target of reducing maternal mortality in 2030 is below 70 / 100,000 live births following the third SDG's target [1]. Anemia in pregnant women can be influenced by education level, parity, maternal age, nutritional status, and ANC frequency. The research conducted by Rasheed (2008) shows that a person's education level affects the awareness for healthy living behavior and establishes the right mindset so that mothers will be easier to receive information and have adequate knowledge [2].

According to Fika's research, women who have parity more than three times has a higher risk compared to women who have parity \leq three times, and this is because mothers who give birth too often will experience a more significant increase in blood plasma volume resulting in a large hemodilution; therefore, the next pregnancy will be more at risk for anemia again [3]. In addition to education and parity, a mother's age is associated with anemia in pregnancy. According to Salmariantiti's research (2012), women at risky age (<20 years and > 35 years) have the risk of getting anemia 1.8 times compared to pregnant women at non-risky age because pregnant women at risky age can harm maternal health and fetal growth [4]. Other factors related to the incidence of anemia are nutritional status and ANC frequency. Isnaini's research (2016) shows that pregnant women who experience malnutrition will affect pregnant women who need sufficient fetal growth nutrition [5]. Sigma's research (2015) shows a significant

correlation between the regularity of ANC visits and anemia incidence. This is because the regularity of ANC visits helps detect the early high risk of pregnancy [6].

Research Methods: This study's population was all anemic pregnant women of the third trimester who came to check themselves at Mantrijeron Primary Health Center in January-November 2017, totaling 84 pregnant. The sampling technique used purposive sampling, namely a sampling technique based on a particular consideration such as the characteristics of the population or characteristics that had been known before [7]. In this study, the samples are all third-trimester pregnant women who experienced anemia, which amounted to 69 people at Mantrijeron Primary Health Center in 2017. This study used secondary data based on Cohort books and medical records of patients at Mantrijeron Primary Health Center. The data was obtained by using the researcher checklist based on variables with the specified criteria.

RESULTS AND DISCUSSION

Frequency distribution of the incidence of anemia in pregnant women in the third trimester in Mantrijeron Primary Health Center

Table 1 Distribution of frequency of anemia incidence in third trimester pregnant women at Mantrijeron Health Center

anemia	Frequency of (F)	Percentage (%)
Anemia (Hb $<$ 11 gr%)	58	84, 1
Not Anemia (Hb \geq 11 gr%)	11	15.9

Based on Table 1, the frequency of anemia was the highest, namely 58 respondents (84.1%), and the number of respondents who were not anemia was as many as 11 respondents (15.9%).

The correlation between Education level and Incidence of Anemia in Third Trimester Pregnant Women at Mantrijeron Primary Health Center

Table 2 Cross-tabulation of correlation between education level and incidence of anemia in pregnant women in the third trimester at Mantrijeron Primary Health Center

Level of Education	Anemia		Not Anemia		Total		p-value
	F	%	F	%	F	%	
Basic (SD)	7	12,1	0	0	7	10,1	0,000
Intermediate (SMP-SMA)	47	81,0	2	18,2	49	71,0	
Height (PT)	4	6,9	9	81,8	13	18,8	

Based on table 2, it is known that as many as seven respondents (12.1%) with basic education levels experienced anemia, 47 respondents (81.0%) with secondary education experienced anemia, and four

respondents (6.9%) higher education level experienced anemia.

The Correlation Between Parity and The Incidence of Anemia In Third Trimester Pregnant Women At Mantrijeron Primary Health Center

Table 3 Cross-tabulation of correlation between parity and anemia in third trimester pregnant women at Mantrijeron Health Center

Parity	Anemia		Not Anemia		Total		p-value
	F	%	F	%	F	%	
Risk (≥3 times)	55	94.8	1	9.1	56	81.2	0.000
No risk (<3 times)	3	5.2	10	90.9	13	18.8	

Based on table 3, it is known that there were five respondents (94.8%) of pregnant women with parity who were at risk of having anemia, and there were three respondents (5.2%) of pregnant women with parity who were not at risk for anemia.

The Correlation between Maternal Age and Incidence of Anemia in Third Trimester Pregnant Women in Mantrijeron Primary Health Center

Table 4 Cross-tabulation of the correlation between maternal age and anemia of pregnant women in the third trimester at Mantrijeron Primary Health Center

Maternal age	Anemia		Not Anemia		Total		p-value
	F	%	F	%	F	%	
Risk (<20 and> 35 years)	54	93.1	1	9.1	55	79.7	0.000
No risk (20-35 years)	4	6.9	10	90.9	14	20.3	

Based on table 4, it is known that 54 respondents (93.1%) were at risky age of anemia while four respondents (6.9%) were at non-risky age of anemia.

The Correlation between Nutritional Status and Anemia in Third Trimester Pregnant Women in Mantrijeron Primary Health Center

Table 5 Cross-tabulation of the correlation between nutritional status and incidence of anemia in pregnant women in the third trimester at Mantrijeron Primary Health Center

Nutritional Status	Anemia		Not Anemia		Total		p-value
	F	%	F	%	F	%	
Less (<23,5 cm)	18	31.0	2	18.2	20	29.0	0.389
Good (≥23,5 cm)	40	69.0	9	81.8	49	71.0	

Based on table 5, it is known that 18 respondents (31.0 %) of Pregnant women with low nutritional status experienced anemia, and as many as 40 respondents (69.0%) pregnant women with good nutritional status experienced anemia.

The Correlation Between ANC Frequency and Incidence of Anemia in Third Trimester Pregnant Women in Mantrijeron Primary Health Center

Table 6 Cross-tabulation of the correlation between ANC visit frequency and anemia incidence in third trimester pregnant women at Mantrijeron Health Center

Frequency of ANC	Anemia		Not Anemia		Total		p-value
	F	%	F	%	F	%	
Less (<4 times)	34	58.6	2	18.2	36	52.2	0.033
Enough (≥4 times)	24	41.4	9	81.8	33	47.8	

Based on table 6, it is known that 34 respondents (58.6%) with irregular ANC visits experienced anemia, and as many as 24 respondents (41.4%) with regular visits experienced anemia. Based on table 1, it is known that the incidence of anemia in pregnant women was 58

respondents (84.1%), and those who were not anemic were 11 respondents (15.9%). Based on the study's data, the average hemoglobin level of pregnant women in the third trimester of anemia was ten gr% to 10.7 gr%. It was still classified as mild anemia because, according to Chowdhury (2014), mild anemia hemoglobin level is 9-10.9

gr%. Anemia is more common in pregnancy because the need for food substances often increases, and changes in the blood and bone marrow occur [8]. Anemia in pregnancy occurs due to an increase in blood cells less than the plasma increase, resulting in blood thinning (hemodilution). The ratio is not balanced; namely, plasma increases 30-50%, blood cells 10-20%, and hemoglobin 19% [9]. Anemia is at risk for women in the process of reproduction, for example, pregnant women. This is because, in pregnancy, hemodilution or blood-thinning often occurs. Blood volume increases in the first trimester, accelerating during the second trimester, and then slows down in the third trimester. If the maternal hemoglobin before pregnancy is <11 gr%, with hemodilution, the hemoglobin of pregnant women will be lower. This decrease reflects the state of hemodilution, with the occurrence of hemodilution will lead to anemia in pregnancy [10]. Pregnant women are very susceptible to iron deficiency anemia because, in pregnancy, oxygen demand increases, triggering an increase in erythropoietin production. As a result, plasma volume increases, and red blood cells (erythrocytes) increase.

Nevertheless, the increase in plasma volume occurred in a more significant proportion than the increase in erythrocyte, so that the concentration of hemoglobin (Hb) due to hemodilution [11]. Based on table 2, it is known that as many as seven respondents (12.1%) who had primary education (SD) experienced anemia. Besides, as many as 47 respondents (81.0%) who had secondary education (SMP-SMA) experienced anemia, and as many as 4 (6.9%) who had higher education (PT) experienced anemia. *Chi-Square* test obtained $p\text{-value} = 0.000$ smaller than $\alpha = 0.05$, indicating that there was a correlation between education level and the incidence of anemia in Mantrijeron Primary Health Center in 2017.

The level of education would affect the awareness for healthy living behavior. Education will form the right mindset where its mothers will be easier to receive information to form adequate knowledge following Radecki's (2005) research, which states that insufficient knowledge can lead to poor health behavior [12]. It is in line with the results of Muzayana&Santoso, N.D. (2016) research showing there is a significant correlation between maternal education and the incidence of anemia at Godean I Primary Health Center with a $p\text{-value} = 0.038$. Most respondents had less knowledge about anemia. This was probably due to respondents' low education level because 62.5% of respondents had graduated from elementary and junior high school [13]. This could be caused by the lack of information conveyed to the community or the community's lack of concern for the information conveyed. One's knowledge can be gained from experience or activities by attending health education, knowledge, learning, and insightful thinking.

Table 3 shows the correlation between parity and the incidence of anemia at Mantrijeron Primary Health Center. Based on table 3, it is known that 55 respondents (94.8%) of pregnant women with risky parity (giving birth \geq three times) experienced anemia, and three respondents (5.2%) of pregnant women who were not at risk (giving birth <3 times) experienced anemia. *Chi-Square* test obtained $p\text{-value} = 0.000$ smaller than $\alpha = 0.05$, indicating that there

was a correlation between parity and the incidence of anemia at Mantrijeron Primary Health Center in 2017. The results are in line with the results of research conducted by Arini (2016), stating that pregnant women with parity more than three times have a higher risk compared to mothers who experienced parity <3 times, with a $p\text{-value} = 0.024$. Anemia in pregnancy is caused by hemodilution or blood thinning. Physiologically a mother with parity or a birth history that is too often will experience a greater increase in blood plasma volume resulting in greater hemodilution [14]. Mothers who have given birth more than three times are at risk of developing serious complications such as bleeding, which is influenced by anemia during pregnancy. Besides, the bleeding causes the mother to lose hemoglobin, and iron reserves decrease so that the next pregnancy became more at risk for anemia [15].

Table 4 shows the correlation between maternal age and the incidence of anemia at Mantrijeron Primary Health Center. Based on Table 4, it is known that 54 respondents (93.1%) suffered from anemia at the age of the at-risk group, and four respondents (6.9%) of anemic pregnant women were at the age of the not at-risk group. *Chi-Square* test obtained $p\text{-value} = 0.000$ smaller than $\alpha = 0.05$, indicating that there was a correlation between maternal age and the incidence of anemia at Mantrijeron Primary Health Center in 2017. The correlation coefficient obtained was equal to 0.607, meaning that the age variable of the mother had a high closeness level with the incidence of anemia; this is consistent with Astor (2002) study stating that women less than 20 years of age and more than 35 years of age are more prone to anemia, this is due to physical and psychological factors [16]. Women who are pregnant at less than 20 years of age are at risk of anemia because they often experience a lack of nutrition. This usually arises because teenagers want an ideal body that encourages a strict diet without nutritional balance. Thus, when they are pregnant, they have low nutritional status.

Meanwhile, women aged over 35 years of age are susceptible to a decrease in endurance. Hence, pregnant women are susceptible to infection and disease [17]. This is supported by research conducted by Salmariantiti (2012), stating that women at risky age (<20 years and \geq 35 years) have a high risk of getting anemia 1.8 times compared to pregnant women at non-risky age because pregnant women who are at risky age can harm maternal health and fetal growth, statistically significant with $p\text{-value} = 0.012$ which states that there is the correlation between maternal age and the incidence of anemia [4].

Table 5 shows the data about the correlation between nutritional status and anemia at Mantrijeron Primary Health Center. Based on table 5, it can be seen that 18 respondents (31.0%) with low nutritional status experienced anemia, and 40 respondents (69.0%) with good nutritional status experienced anemia. *Chi-Square* test obtained $p\text{-value} = 0.389$ more than $\alpha = 0.05$, indicating that there was no correlation between nutritional status of anemia at Mantrijeron Primary Health Center in 2017. This research is in line with Corwin's (2003) research, stating that there is no correlation between nutritional status and hemoglobin level in pregnant women. It is not merely nutritional status that affects pregnant women's hemoglobin levels. However, many factors influence it such as infectious diseases,

gestational age, maternal age, education level, or nutritional status [18]. *LILA* or upper arm circumference is used to determine the nutritional status of pregnant women. However, *LILA*'s measurement cannot be used as a monitoring tool for changes in nutritional status in the short term. In this case, it could influence the pattern of iron consumption or processing of nutrients consumed by pregnant women, such as cooking methods that are not according to the recommended or correct food processing procedures.

Consequently, the iron contained in the processed food is decreased [19]. The results of this study show that there was no correlation between nutritional status and the incidence of anemia due to the large number of respondents who had good nutritional status, as many as 69.0% (*LILA* \geq 23.5 cm) compared to pregnant women who had the less nutritional status of (29.0%) so that there was no correlation between the two factors. Based on the data, pregnant women who had good nutritional status might be suffered from anemia due to other factors. Table 6 shows the correlation between the frequency of ANC visits and the incidence of anemia at Mantrijeron Primary Health Center. Based on table 6, it can be seen that 34 respondents (58.6%) with irregular ANC visits experienced anemia and 24 respondents (41.4%) with regular ANC visits experienced anemia. *Chi-Square* test obtained *p-value* = 0.033 smaller than $\alpha = 0.05$, indicating a correlation between the frequency of ANC visit and the incidence of anemia at Mantrijeron Primary Health Center in 2017. In this study, ANC visits of pregnant women at Mantrijeron Primary Health Center at the frequency of visits less (<4 times) were as many as 34 respondents (58.6%) of a total of 58 anemic respondents. There were more than 50% of irregular ANC visits at Mantrijeron Primary Health Center. From the results of observations according to Cohort data and the results of interviews from midwives of pregnant women, other than examining their pregnancies at Mantrijeron Health Center, they also checked their pregnancies at the hospital. ANC services aim to identify problems during pregnancy so that the mother and baby's health will be maintained until delivery. Antenatal Care (ANC) services can be monitored by visiting pregnant women during pregnancy checkups [20]. It is in line with Titaley Research (2010), which revealed the close connection between ANC visits and maternal education level [21]. The higher the education level of pregnant women, the higher the frequency of ANC visits. Higher education reflects the knowledge that is better and influences someone in applying it to antenatal care implementation [22].

CONCLUSION

Based on the results of the identification of characteristics of anemia in pregnant women in the third trimester at Mantrijeron Primary Health Center, it can be concluded as follows: there are characteristics of respondents that influence the incidence of anemia in the third trimester pregnant women at Mantrijeron Primary Health Center in 2017, namely elementary and secondary education level as many as 54 respondents (93.1%), risk parity as many as 55 respondents (94.8%), risky age maternal age as many as 54 respondents (93.1%), good nutritional status of 40

respondents (69.0%), the frequency of the ANC less than 34 respondents (58, 6%). There is a correlation between educational level, parity, maternal age with *p-value* = 0.000 and the frequency ANC with *p-value* of 0.033 and anemia among pregnant women in the third trimester Mantrijeron Primary Health Center 2017. Pregnant women should conduct antenatal visit regularly at least four times during pregnancy so that you they can minimize the complications such as anemia.

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