

Correlation Between Antenatal Care Visit (ANC), Body Mass Index (BMI) Before Pregnant and Anemia in Third Trimester Pregnant Mother

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ABSTRACT

Background: The World Health Organization (WHO) reported that globally anemia affects 32.4 million (38.2%) pregnant women. The 2015 Intercensal Survey by the Central Statistics Agency shows that maternal mortality in Indonesia was 305 / 100,000 live births. Postpartum hemorrhage is one of the causes of maternal mortality in Indonesia, resulting in anemia.

Aim: This study aimed to determine the correlation between Antenatal Care Visit (ANC), Body Mass Index (BMI) before pregnancy, and the incidence of anemia in pregnant women in the third trimester.

Method: This quantitative research used a retrospective case-control research design. The data used secondary data from medical records of pregnant women in Primary health care during 2017. Analysis of data used Chi-square and Mann Whitney.

Results: The results showed a correlation between ANC visit and anemia in pregnant women in the third trimester with a p-value of 0.02 (OR = 2.87, CI = 1.490-5.528).

Conclusion: The Mann-Whitney test results obtained a p-value of 0.84, which means there was no correlation between BMI before pregnancy and anemia in pregnant women in the third trimester. ANC was essential to detect early complications in pregnant women.

Keywords: Antenatal Care Visit (ANC), Body Mass Index (BMI), Anemia

INTRODUCTION

Anemia was one of the complications that often occur in pregnant women. The World Health Organization (WHO) shows that anemia affects 32.4 million (38.2%) pregnant women in the world [1]. Pregnant women in developing countries have anemia (50%) more significantly when compared to developed countries (12% - 25%) [2]. The World Health Organization (WHO) in 2014 reports that globally, the Maternal Mortality Rate (MMR) is 179.000, while in South Asia, 69.000 and Southeast Asia 16.000. Additionally, Indonesia's maternal mortality rates reached 190/100.000 live births; Vietnam was 49/100.000 live births; Thailand reached 26/100.000 live births; Brunei reached 27/100.000 live births, and Malaysia was 29/100.000 live births [3].

Indonesia was one of the developing countries with a high Maternal Mortality Rate (MMR). The 2015 Intercensal Survey by the Central Statistics Agency showed that MMR in Indonesia was 305/100.000 live births and post partum hemorrhage was one of the causes of MMR in Indonesia. It has predisposing factors, i.e., anemia [4]. Local of Health Office of Yogyakarta Province in 2015 stated that the incidence of anemia in pregnant women from 2010 to 2014 increased. Hence, it was necessary to distribute iron tablets (Fe) and monitor pregnant and postpartum women's compliance for taking iron tablets [5]. Anemia was the cause of maternal morbidity and mortality in the third trimester. Risk factors for third-trimester anemia for the mother are antepartum and intrapartum hemorrhage, infection, and cardiac decompensation for maternal death. Anemia negatively impacts babies, such as less development of baby's braid, asphyxia, intrauterine fetal death, and intrauterine growth retardation.

Implementing an integrated Antenatal Care (ANC) service could be an alternative to prevent anemia because healthcare providers will provide support and assessment to prevent anemia during ANC. Maternal health services that must be provided include midwifery services with 10 T [6]. Maternal body weight should be measured from the first antenatal care and monitored during antenatal visits. The maternal height measurement is measured at the time of the first antenatal visit. Size of body weight and height are used to calculate body mass index (BMI). An excessive increase in BMI can cause diabetes in pregnancy, hypertension, and thromboembolism. One of the predisposing factors for thromboembolism in pregnancy is anemia and postpartum hemorrhage [7]. Research by Aerie showed that pregnant women who experience anemia significantly increased hemoglobin levels at the last Antenatal Care (ANC) visit compared to the first visit [8]. It stated that pregnant women with body mass index (BMI) classified as obese had fewer iron deficiencies than pregnant women with normal BMI [9]. The results of Andayasari's study found the prevalence of anemia among the third trimester of pregnant women was 33.7%. This finding was lower than previous studies, which revealed that the bulk of anemia in the third trimester of pregnancy was 46.6% in Bali, as well as 43% of pregnant women in the third trimester were anemic in Malaysia [10].

Data from the Yogyakarta Province Local Health Office stated that anemia in pregnant women in Yogyakarta decreased from 2009 to 2015. In 2015 the prevalence of anemia in pregnant women in Yogyakarta was 14.85%. An increase in most anemia still occurred in several districts or cities in Yogyakarta, including Yogyakarta and Sleman. The anemia prevalence rate in 2014-2015 in Gunung Kidul

Regency decreased by 5.1%, Bantul decreased by 1.29%, Kulonprogo decreased by 1.03%, and Sleman Regency increased 2.92%, and Yogyakarta Municipality increased by 4.29% [11]. In Sleman, there were three health centers with pregnant women who experienced the highest level of anemia, namely Prambanan Health Center (25.34%), Godean II Health Center (23.53%), and Pakem Health Center (15.98%) [12]. Based on this background, the authors were interested in conducted research entitled "The Relationship between Antenatal Care (ANC), Body Mass Index (BMI) Before Pregnant and Anemia in Third Trimester Pregnancy."

METHOD

This research applied a quantitative study with descriptive-analytic analysis using a case-control research design with a retrospective approach. The type of data used secondary data from medical records. The study population was all

pregnant women in the third trimester who visited antenatal care (ANC) in a Health Center. The sampling technique used simple random sampling with a 1: 1 in the case group and control group. In this study, the control samples were 86 third-trimester pregnant women who did not have anemia, and 86 cases were pregnant women with anemia in the third trimester. Data collection was taken in 3 (three) months, from April until June 2018.

The independent variable of this study was the anemia of third-trimester pregnancy. The dependent variable was Antenatal Care (ANC) and Body Mass Index (BMI) before pregnancy. Data analysis used Chi-Square Test for anemia variables and ANC visits and Mann Whitney test for anemia and BMI variables.

RESULTS

Univariate Analysis

Table 1. Characteristics of Respondent

Characteristics	Anemic		Anemic		N (Total)	%
Age	f	%	f	%		
Late						
Teenagers	24	36.4	42	63.6	66	38.38
Early Adult	46	67.6	22	32.4	68	39.53
Late Adult	16	42.1	22	57.9	38	22.09
Total	86		86			100
Parity						
Primipara	20	36.4	35	63.6	55	31.98
Multipara	65	70.7	27	29.3	92	53.49
Grande						
Multipara	1	4	24	96	25	14.53
Total	86		86			100

The results showed that from 172 respondents, the majority were in the Early Adult age group (26-35 years), as many as 68 (39,53%) mothers. Based on the maternal

parity, most respondents were Multipara (having given birth 2-4 times) was 92 (53.49%) mothers.

Bivariate Analysis

Table 2. Correlation between Antenatal Care Visits (ANC) and Anemia in Third Trimester Pregnancy

ANC Visits	Anemia in Pregnancy						OR	95 % CI	P-Value
	No Anemia		Anemia		Total				
	n	%	n	%	n	%			
Appropriate Standard	66	76.74	46	53.49	112	65.11	2.87	1.490 5.528	0.02
Not appropriate	0	0	0	0	0	0			
Standards	20	23.26	40	46.51	60	34.89			
Total	86	100	86	100	172	100			

Based on Table 2, respondents with anemia were more common in respondents having ANC visit that was appropriate to standards was 46 (53.49%) mothers. Also, mothers who did not have anemia were more respondents with ANC visits applicable to standards as many as 66 (76.74%) mothers. Of the total respondents (cases and

controls) of 172, it could be concluded that there was a significant correlation between ANC visits and the incidence of anemia in pregnant women in the third trimester with a p-value of 0.02 (OR = 2.87, CI = 1.490-5.528).

Table 3. Correlation between Body Mass Index (BMI) Before Pregnancy and Anemia in Third Trimester of Pregnancy

BMI Before Pregnant	Anemia in Pregnancy				Total		P-Value
	No Anemia		Anemia				
	n	%	n	%	n	%	
Thin	4	4.65	8	9.3	12	6.98	0.84
Normal	22	25.58	31	36.05	53	30.81	
Obese	60	69.77	47	54.65	107	62.21	
Total	86	100	86	100	172	100	

Based on Table 3, it can be concluded that respondents with anemia from respondents classified as obese before pregnancy was (54.65%). Respondents who did not have anemia were more respondents with pre-pregnancy BMI classified as obese as many as 60 (69.77%). The p-value of this bivariate analysis was 0.84. This means that there was no significant correlation between BMI before pregnancy and the incidence of anemia in pregnant women Individuals [13]. Anemia in pregnancy is a condition where hemoglobin levels are below 11 g % in the first and third trimesters or groups <10.5g% in the second trimester (AB, 2009). Antenatal care is a preventive service to monitor maternal health and prevent complications for the mother and fetus [14]. One of the ANC aims to recognize and early avoid complications during pregnancy, including a history of general.

DISCUSSION

Correlation between Antenatal Care Visits (ANC) and Anemia in Third Trimester Pregnancy. This study showed that the p-value of ANC visits with anemia in third Trimester pregnant women was 0.02. This means that H_0 was accepted; the Antenatal Care visit (ANC) was significantly associated with anemia in pregnant women in the third trimester at Prambanan Primary Health Center. The OR value obtained 2.87. This means that respondents who had ANC visits that were not according to standards had the opportunity to anemia twice as much as respondents who had ANC visits. Anemia is a condition of decreased hemoglobin level, hematocrit, and red blood cell below average values set for illness, obstetrics, and surgery such as anemia [15]. The ANC service standards in Indonesia are minimal four times, was once in the first trimester, once in the second trimester, and twice in the third trimester [16]. In providing ANC services, health workers must provide at least 10 T, one of which is iron tablets to prevent anemia [17]. Suppose anemia is not detected during pregnancy, especially starting in the third trimester of pregnancy. In that case, it can be complications that can threaten the mother and baby's life, such as Postpartum hemorrhage and asphyxia lack of oxygen levels in the Blood [18]. With the conducting ANC examination, pregnant women will find information about the importance of taking iron tablets to prevent anemia. Based on Tusuubira and Kiwanuka's research, the results showed that mothers who routinely antenatal visits according to standards would be more compliant to take iron tablets compared to mothers who did not visit ANC according to standards [19]. This study's results are also similar to the effects of research conducted by Anlaakuu and Anto Francwas, which states that mothers with low hemoglobin levels at the first

antenatal visit will experience an increase in Hb levels the last ANC visit during the study [1].

In the bivariate analysis using Mann Whitney test on Body Mass Index (BMI) before pregnancy with anemia in the third trimester, pregnant women obtained a p-value with a value of 0.84. This means that if the p value > 0.05, the Body Mass Index (BMI) before pregnancy is not significantly correlated with the anemia in pregnant women in the third trimester.

Correlation of Body Mass Index (BMI) with Anemia in Third Trimester in Pregnancy

Body Mass Index is an indicator of excess weight based on the index of body weight in kilograms divided by the square of body height in meters (kg/m^2) [20]. They are maintaining a good nutritional status before pregnancy is considered an essential aspect of pregnancy. Obese pregnant women are at high risk of developing diabetes, shoulder dystocia, and primary cesarean section compared to pregnant women with a normal BMI. Conversely, underweight pregnant women are at increased risk for premature birth and anemia [21]. There was no significant correlation between pre-pregnancy BMI with the anemia in pregnancy in this study. No analysis performed further influenced external factors such as age, parity, education, and upper arm circumference (Lila). In adults, iron deficiency can be caused by external factors such as micronutrient deficiencies other than iron and differences in the body's metabolic rate of each person. In someone with a normal BMI, it cannot metabolize better than someone who is obese and other wishes [9]. This study's results are also similar to the research by [21], which states that there is no difference in iron deficiency in mothers with various BMI levels.

CONCLUSIONS

ANC visits were crucial in midwifery services that improve mothers' and children's health and well-being. With the implementation of integrated ANC services, healthcare providers could detect early complications in pregnant women; one of them was anemia. The importance of ANC visits had also to be realized by pregnant women to undergo the pregnancy process properly and healthy. When pregnant women with anemia have routine ANC visits, they would have appropriated assessment and treatment to prevent maternal and infant death. Monitoring Body Mass Index (BMI) before pregnancy was essential to prepare a healthy pregnancy condition. Although this study results did not show a significant correlation, monitoring of BMI should not be ruled out. Being overweight and weight

could interfere with the metabolic processes in the body that should be normal.

This study's limitation is that it does not carry out analysis against external factors such as maternal age, recent education, parity, and upper arm circumference (Lila). For further research, it is better to analyze these external factors so that the research results can be more specific to determine the characteristics of the occurrence of anemia and prevent it. The application of Health Technology Assessment (HTA) is one of the innovations that need to be developed in health services and research, especially maternal and child health.

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