



## **Factors Related to Anemia in Trimester of III among Pregnant Women in the Working Area of Puskesmas, Cengkareng District, 2019**

<sup>1</sup>Ummu Nida Ilwihda, <sup>2</sup>Gisely Vionalita

<sup>1</sup>Student of Public Health, Esa Unggul University, Jakarta

<sup>1</sup>Lecturer of Public Health, Esa Unggul University, Jakarta

---

### **Artikel info**

---

#### **Article history:**

Received: March 19th, 2021

Revised: April 19th, 2021

Accepted: May 10th, 2021

---

#### **Correspondence author:**

Ummu Nida Ilwihda

E-mail:

[nidaummu27@gmail.com](mailto:nidaummu27@gmail.com)

---

#### **DOI:**

<http://doi.org.10.35654/ijnhs.v4i3.427>

---

**Abstract.** Anemia in pregnant women is a condition of red blood cells (erythrocytes) <11 gr/dl in trimesters III. It is unable to fulfill its function as a carrier of oxygen to all body tissues. Data obtained from the Cengkareng District Health Center recorded the number of anemia sufferers in third-trimester pregnant women in October 2019 as many as 40 people. This study aims to determine the factors associated with anemia incidence in third-trimester pregnant women in the Cengkareng District Health Center in 2019. This type of research is quantitative with a case-control research design to obtain field data of 80 respondents conducted by filling in medical records with total sampling techniques for case group respondents and control groups. The results of the Chi-Square test showed a relationship between nutritional status ( $p = 0.002$ ), ANC visits ( $p = 0,000$ ), parity ( $p = 0.022$ ) and the incidence of anemia in third trimester pregnant women. It is expected that the public health center can further optimize programs for pregnant women so that they do not experience an increase in third-trimester pregnant women's anemia.

**Keywords:** anemia third-trimester pregnant women, age, nutritional status, antenatal care visits, parity.



This is an Open Access article distributed under the terms of the Creative Commons Attribution 4.0 International License CC BY -4.0

---

## INTRODUCTION

It is estimated that more than 40% of pregnant women worldwide are anemic. At least half of this burden of anemia is assumed to be due to iron deficiency. Pregnant women need additional iron and folic acid to meet their own nutritional needs and the needs of the developing fetus. Lack of iron and folic acid during pregnancy can negatively impact the health of the mother, her pregnancy, and fetal development. Evidence has shown that the use of iron and folic acid supplements is associated with a reduced risk of iron deficiency and anemia in pregnant women (1).

Based on data from the World Health Organization (2), an indicator of anemia problems in pregnant women (Hb <11 g / dL) in Indonesia is 42.0%. Indicators of anemia have various causes, of which iron deficiency is considered the most common cause of anemia. Other causes include acute and chronic infections resulting in inflammation and blood loss, deficiencies of other vitamins and minerals, especially folate, vitamin B12, vitamin A, and other genetically inherited traits, such as thalassemia. These indicators are used to monitor progress towards achieving Global Nutrition Target 2, a 50% reduction in anemia among women of reproductive age by 2025.

Based on the 2018 Basic Health Research results, the proportion of anemia in pregnant women has increased over the last five years, from 2013 to 2018. Riskesdas in 2013 was 37.1%, while the results of Riskesdas 2018 had reached 48.9% so that it can be ignored for five years. In the last year, anemia in pregnant women has increased by 11.8% (3). In pregnancy, there is relatively anemia because pregnant women experience remodels (dilution) with an increase in the volume of 30% to 40%, which peaks at 32 to 34 weeks of gestation. The increase in blood cells is 18% to 30%, and hemoglobin is around 19% (4). According to (5), anemia in pregnancy can mean pregnant women with iron deficiency in the blood. Also, anemia in pregnancy can be a condition of the mother with hemoglobin (Hb) levels <11 g% in the first and third trimesters, while the second-trimester hemoglobin levels <10.5 g%. In healthy offering and lack of insurance with pregnancy is 20 - 35 years of age, pregnancy risky pregnancies are <20 and> 35 years (6). It was in line with the previous research that revealed that out of 631 registered cases, most women who came for antenatal care were between 22 and 29 years, followed by those between 18 and 21 years (7). However, only 6.8% between 30 and 35 years registered, and more than 50% of these had moderate anemia. The present study revealed that the age of the respondents ranges from 19 to 29 years (8). It was seen that majority of the age of study participants ranged from 20 to 25 years, with the mean age being 22 years. This is related to the biological and psychological condition of pregnant women. The incidence of anemia in pregnant women is one of the causes, namely mothers who experience nutritional problems, namely the nutritional status of KEK due to insufficient food intake (9). A previous study (10) mentioned that cases of nutritional deficiency anemia are generally accompanied by malnutrition, parasite infestations, all of which stem from the reluctance of mothers to undergo antenatal surveillance. If Antenatal Care (ANC) is performed, anemia can be detected because anemia does not state a complaint in its early stages. Complaints are usually felt when it has entered an advanced stage.

Parity  $\geq 4$  is a factor in anemia incidence, which is closely related to gestational distances that are too close to  $< 2$  years. This is due to frequent pregnancy, so that it can deplete the body's nutrient reserves.

Based on medical record data for Antenatal Care (ANC) at the Cengkareng District Health Center, based on ANC visit data from January to October 2019, there were 362 cases of anemia in pregnant women. Forty pregnant women tested positive for anemia by midwives in October, with 465 pregnant women who did not experience anemia in the third trimester, so that the prevalence was 8.60%. In October 2019, the impact of anemia in third-trimester pregnant women found 13 cases of anemia in the third trimester where bleeding occurred during childbirth could threaten the death of the mother and fetus. Based on the information obtained, the causes of anemia in pregnant women in the third trimester of the Cengkareng District Health Center pay attention to nutrition during the first and second trimesters of pregnancy. Therefore, the pregnant woman's body does not get good nutrition and does not get a lot of iron.

## **OBJECTIVE**

The study aimed to examine the relationship between age, nutritional status, Antenatal Care visits, and parity with anemia in the third trimester of pregnant women at the Cengkareng District Health Center.

## **METHOD**

This study uses a case-control research design. This research was conducted in the Work Area of the Cengkareng District Health Center, West Jakarta, in October 2019. The population in this study were all mothers who were pregnant in the third trimester in the work area of the Cengkareng District Health Center in October 2019. In this study, cases were found in October 2019. as many as 40 people with case sampling technique using total sampling, for control as many as 40 people using purposive sampling. This sample was selected using a comparison of the case: control groups, which is 1:1 for cases and controls in this study.

The research instrument was the filling sheet by filling in the medical records based on the health center for all third-trimester pregnant women who have been diagnosed with anemia by the midwife. The sample calculation in this study was carried out using a two-proportion hypothesis test to obtain the relationship between the dependent variable and the independent variable. After performing the chi-square test, some conditions must be met, namely, if the table is  $2 \times 2$  and there is no value of  $E < 5$ , then the test for continuity correction is acceptable. The second stage, namely measuring the risk of the independent variable against the dependent variable. Measuring the amount of risk in the study was carried out by looking at the OR value. This study uses a 95% confidence level, a test of 80% with a significance test of 5%. If the P-value  $\leq$  is 0.05, then there is a close relationship between the dependent and independent variables. If the P value  $> 0.05$ , then there is no close relationship between the dependent and independent variables.

In conducting this research, the researcher received a recommendation from Esa Unggul University and applied it to the Head of the Service Unit for the Community Health Unit at the Cengkareng Subdistrict Health Center to obtain research approval. Ethics that must be done in research are informed consent, anonymity, and confidentiality. This research was registered at

the Secretary of the Esa Unggul University Code of Ethics Enforcement Council with Number: 0113-20.049/DPKE-KEP/FINAL-EA/UEU/II/2020.

## RESULT

### Characteristics of Respondents

Table 1 showed the characteristic of respondents. The findings found that from 80 respondents, 81.2% of them were not at risk of anemia, and 18.8% of pregnant women were at risk of anemia. Regarding nutritional status variable, the findings showed 85.0% of pregnant women have risk of anemia, and 15.0% of them were not at risk for anemia. In the ANC visit variable, it was known that 57 (71.2%) pregnant women had good visits, and 23 (28.8%) pregnant women had poor visits. In the parity variable, it is known that as many as 73 people (91.2%) pregnant women are at risk of anemia, and 7 people (8.8%) pregnant women are not at risk of anemia.

Table 1. Characteristics of Respondents

Characteristics	Category	Total	Percentage
		80	100%
Age	Risk	15	18.8
	Not Risky	65	81.2
Nutritional Status	Risk	12	15.0
	Not Risky	68	85.0
Antenatal Care Visits	Bad	23	28.8
	Good	57	71.2
Parity	Risk	7	8.8
	Not Risky	73	91.2

### Relationship between age, nutritional status, antenatal care visits, and parity with anemia

Based on table 2, the bivariate analysis results on the chi-square test show no relationship between age and the incidence of anemia in third-trimester pregnant women ( $p\text{-value } 1,000 > 0.005$ ). The Odds Ratio value indicates that the age of pregnant women in the third trimester is at risk of having a protective effect or a lower chance of developing anemia by 0.8 times than those who are not at risk.

There is a correlation between nutritional status and the incidence of anemia in pregnant women in the third trimester ( $p\text{-value } 0.002 < 0.005$ ). The Odds Ratio value shows that the nutritional status is at risk for pregnant women in the third trimester, which is 8.2 times more likely to be at risk of developing anemia compared with a nutritional status that is not at risk of anemia.

There is a correlation between ANC visits and the incidence of anemia in pregnant women in the third trimester ( $p\text{-value } 0.000 < 0.005$ ). The Odds Ratio value shows that pregnant women in the third trimester with poor ANC visits can be 9 times more likely to have anemia than third-trimester pregnant women with good ANC visits.

There is a correlation between parity and the incidence of anemia in pregnant women in the third trimester ( $p\text{-value } 0.022 < 0.005$ ). The Odds Ratio value shows parity for pregnant



women in the third trimester at risk, namely having a 5.2 times greater chance of having anemia risk than maternal parity. Third-trimester pregnancy who are not at risk

Table 2. Cross tabulation of age, nutritional status, antenatal care visits, and parity

Characteristics	Category	Anemia In Trimesters III Pregnant Women				p-value	OR (95% CI)
		Positive		Negative			
		N	%	N	%		
Age	Risk	7	17.5	8	20.0	1.000	0.848 (0.275-2.613)
	Not Risky	33	82.5	32	80.0		
<b>Total</b>		40	100	40	100		
Nutritional Status	Risk	16	40.0	3	7.5	0.002	8.222 (2.162-31.271)
	Not Risky	24	60.0	37	93.5		
<b>Total</b>		40	100	40	100		
Antenatal Care Visits	Bad	20	50.0	4	10.0	0.000	9.000 (2.698-30.021)
	Good	20	50.0	36	90.0		
<b>Total</b>		40	100	40	100		
Parity	Risk	12	30.0	3	7.5	0.022	5.268 (1.361-20.534)
	Not Risky	28	70.0	37	92.5		
<b>Total</b>		40	100	40	100		

## DISCUSSION

Based on the results of statistical tests, it was found that there was no relationship between age and the incidence of anemia in third-trimester pregnant women. The Odds Ratio (OR), showing that the age of the third trimester pregnant women at risk of having a protective effect or having a lower chance of experiencing anemia by 0.8 times, compared with a period without risk. This is in line with research conducted by (11) at the Cikampek Public Health Center, Karawang Regency, which states that there is no significant relationship between age and the incidence of anemia in third-trimester pregnant women. It can be concluded that the age of pregnant women cannot be a determinant of anemia but is made possible by other factors such as nutritional status, ANC visits, and parity.

Based on the statistical test, it was found that there was a relationship between nutritional status and the incidence of anemia in third-trimester pregnant women. The Odds Ratio (OR) shows that the nutritional status at risk in third-trimester pregnant women had a chance of 8.2 times greater risk of developing anemia than with nutritional status that is not at risk of anemia conducted by (12). This is in line with the research conducted by (13). This study aims to assess the magnitude and factors associated with anemia among pregnant women attending antenatal care in Bench Maji, Keffa, and Sheka zones of public hospitals, Southwest, Ethiopia, 2018. The magnitude of anemia in this study is the nutritional status (undernutrition) [AOR 3.00, 95% CI

(2.22–3.97)] were factors associated with anemia. A previous study showed a relationship between nutritional status and the incidence of anemia in the third trimester of pregnant women at the Sambutan Public Health Center in Samarinda City (10). Another study also showed a relationship between nutritional status and the incidence of anemia in the third trimester of pregnant women (11). The incidence of anemia in pregnant women is one of the causes, namely mothers who experience nutritional problems, namely the nutritional status of KEK due to insufficient food intake (9). It was in line with the previous study that showed the nutritional status of mothers has a causal relationship with the incidence of anemia in pregnant women (14). Mothers with KEK were 31.8 times more likely to experience anemia than mothers without KEK. The results that have been presented show that 169 pregnant women with KEK, of whom 154 people (91.1%) have anemia. Pregnant women whose KEK with LILA <23.5 are more at risk of developing anemia in pregnant women due to insufficient nutrition.

Based on the statistical test, it was found that there was a relationship between ANC visits and the incidence of anemia in third-trimester pregnant women. The Odds Ratio (OR) shows that third-trimester pregnant women with poor ANC visits had a nine times greater potential to be at risk of anemia than pregnant women trimester III with a good ANC visit. This research aligns with the study conducted (15) showed at the Curug Tangerang District Health Center. There is a relationship between ANC visits and the incidence of anemia in third-trimester pregnant women. According to the (16), in conducting antenatal examinations, based on the provisions of the Guidelines for Integrated Antenatal Services of the Indonesian Ministry of Health. Health workers must provide quality services according to standards, one of which is to check the blood hemoglobin levels of pregnant women at least once in the first trimester and once in the third trimester. Phone check to sleep the pregnant woman is suffering from anemia or not during her pregnancy because anemia can affect the growth process of the fetus in the womb. During their most recent ANC visit, the prevalence of anemia was found to be similar to that of the first visit, with 131 (41.5%) of them being anemic [mean Hb: 11.24 g/dl, range 8.10–14.5 g/dl] (17). Therefore the first ANC visit was significantly associated with anemia, which is in line with research conducted by (18). A positive correlation was found between the frequency of ANC visits and anemia. Pregnant women who visited ANC  $\leq 2$  times were three times more likely to be frail than those who visited ANC  $> 2$  times. This finding agrees with previous studies in Ethiopia, which found that decreased frequency of ANC visits significantly increased the risk of anemia.

Based on the statistical test, it was found that there was a relationship between parity and the incidence of anemia in third-trimester pregnant women. The Odds Ratio (OR) shows the parity of the third trimester pregnant women at risk with a 5.2 times greater chance of having anemia than parity of trimester pregnant women III, which is not a risk. This study is under research conducted by (19). This study indicates that there was an effect of nutritional status on the incidence of anemia in pregnant women at the Pasir Panjang Public Health Center Kupang. According to the researcher's analysis, respondents who gave birth 2-3 times at the Public Health Center did not rule out the possibility of not experiencing anemia if they ignored the nutritional needs during pregnancy. The nutrients would be shared with the mother and the fetus. The previous study confirmed anemia prevalence in pregnant women was statistically affected by the parity factor (20). Pregnant women with risky parity (parity  $\geq 3$ ) were 5.930 times more likely to have anemia than women with no risky parity (parity  $< 3$ ). It was consistent with the previous study mentioned that at the Mantrijeron Health Center, Yogyakarta, there is a significant relationship between parity of pregnant women and the incidence of anemia in third-

trimester pregnant women (15). The cases of nutritional deficiency anemia are generally accompanied by malnutrition, parasite infestations, all of which stem from the reluctance of mothers to undergo antenatal surveillance (1). Parity  $\geq 4$  is a factor in anemia incidence, which is closely related to gestational distances that are too close to  $< 2$  years.

## CONCLUSION

Based on the results of research on factors related to the incidence of anemia in third trimester pregnant women in the Cengkareng District Health Center Work Area in 2019, it can show a significant relationship between nutritional status, ANC visits, and parity on the incidence of anemia in pregnant women in trimester III in the Cengkareng District Health Center Work Area in 2019. There is no significant difference between age and the incidence of anemia in pregnant women in the third trimester in the Cengkareng District Health Center Work Area in 2019.

## ACKNOWLEDGMENT

We would like to thank the head of public health and administration of the Cengkareng District Health Center Work Area of the respondents in this study.

## REFERENCES

- (1) World Health Organization (WHO). Daily Iron and Folic Acid Supplementation During Pregnancy. 2016; Available from: [https://www.who.int/elena/titles/daily\\_iron\\_pregnancy/en/](https://www.who.int/elena/titles/daily_iron_pregnancy/en/)
- (2) World Health Organization (WHO).. Nutrition Landscape Information System (NLIS). 2016; Available from: <http://apps.who.int/nutrition/landscape/report.aspx?iso=idn>
- (3) Kementerian Kesehatan Republik Indonesia. Riset Kesehatan Dasar. 2018;
- (4) Manuaba IB. Ilmu kebidanan Penyakit Kandungan dan KB. Jakarta: EGC; 2010.
- (5) Astutik RY, Ertiana D. Anemia Dalam Kehamilan [Internet]. Jawa Timur: CV. Pustaka Abadi; 2018. Available from: <https://books.google.co.id/books?id=6tisDwAAQBAJ&printsec=frontcover&dq=faktor+yang+mendukung+anemia+terhadap+kehamilan+ibu+hamil&hl=id&sa=X&ved=0ahUK EwivavLA6rPIAhXBTX0KHSBLDYsQ6AEILzAB#v=onepage&q=faktor yang mendukung anemia terhadap kehamilan ibu hami>
- (6) Manuaba IB. Pengantar Kuliah Obstetri. Jakarta: EGC; 2007.
- (7) Yadav U, Singh TB, Chaubey L. Prevalence of anemia in antenatal women at first point-of-care visit to district combined hospital, Chakia, Uttar Pradesh, India. ResearchGate [Internet]. 2020; Available from: [https://www.researchgate.net/publication/343089852\\_Prevalence\\_of\\_anemia\\_in\\_antenatal\\_women\\_at\\_first\\_point-of-care\\_visit\\_to\\_district\\_combined\\_hospital\\_Chakia\\_Uttar\\_Pradesh\\_India](https://www.researchgate.net/publication/343089852_Prevalence_of_anemia_in_antenatal_women_at_first_point-of-care_visit_to_district_combined_hospital_Chakia_Uttar_Pradesh_India)
- (8) Pundkar R, Powar J, Sonar S, Desai M. Risk Factors for Anemia in Pregnancy: A Case-Control Study. WIM J [Internet]. 2017; Available from: <http://www.wimjournal.com/html/journal/images/v2a3.pdf>
- (9) Wahyudin. Pembelajaran dan Model-model Pembelajaran. Jakarta: IPA Abong; 2008.
- (10) Arisman. Buku Ajar Ilmu Gizi: Gizi Dalam Daur Kehidupan. Jakarta: Buku Kedokteran

- EGC; 2009.
- (11) Rahayu S. Faktor-faktor Yang Berhubungan Dengan Kejadian Ibu Hamil Trimester III Di Puskesmas Cikampek Kabupaten Karawang. 2015;
  - (12) Handayani S. Faktor-faktor Yang Berhubungan Dengan Kejadian Anemia Pada Ibu Hamil Di Puskesmas Sambutan Kota Samarinda. Mahakam Midwifery. 2016;No.1:126–38.
  - (13) Gudeta TA, Regassa TM, Belay AS. Magnitude and factors associated with anemia among pregnant women attending antenatal care in Bench Maji, Keffa, and Sheka zones of public hospitals, Southwest, Ethiopia, 2018: A cross-sectional study. Natl Libr Med [Internet]. 2018; Available from: <https://pubmed.ncbi.nlm.nih.gov/31751368/>
  - (14) Safrina D, Dewi O, Nurlisis, Mitra, Damayanti ka P. Analysis of Factors Correlated with Anemia Incidence in Pregnant Women at Working Area of the Sidomulyo Health Center Outpatient UPTD Pekanbaru City. Birtain Int Humanit Soc Sci J [Internet]. 2019; Available from: <http://biarjournal.com/index.php/biohs/article/view/378/404>
  - (15) Sartikah I. Faktor-faktor Yang Berhubungan Dengan Kejadian Anemia Pada Ibu Hamil Trimester III Di Puskesmas Kecamatan Curug Tangerang Tahun 2015. 2017;
  - (16) Kemenkes R. Pedoman Pelayanan Antenatal Terpadu. 2010;
  - (17) Analaaku P, Anto F. Anaemia in pregnancy and associated factors: a cross-sectional study of antenatal attendants at the Sunyani Municipal Hospital, Ghana. BMC Res Notes [Internet]. 2017; Available from: <https://bmcresnotes.biomedcentral.com/articles/10.1186/s13104-017-2742-2>
  - (18) Mohamed NEB, Hassan RHA. Prevalence and Factors Associated with Anemia among Pregnant Women Attending Ante-Natal Clinic in the Second and Third Trimesters at Soba University Hospital, Khartoum State, Sudan (2018- 2019). Int J Heal Sci Res [Internet]. 2020; Available from: [https://www.ijhsr.org/IJHSR\\_Vol.10\\_Issue.8\\_Aug2020/32.pdf](https://www.ijhsr.org/IJHSR_Vol.10_Issue.8_Aug2020/32.pdf)
  - (19) Atapukang F, Littik SK., Trisno I, Weraman P, Ruliyati LP. Analysis of Risk Factors for Anemia in Pregnant Women in the Working Area of Pasir Panjang Public Health Center Kupang. IJCMR [Internet]. 2020; Available from: [https://www.ijcmr.com/uploads/7/7/4/6/77464738/ijcmr\\_3353.pdf](https://www.ijcmr.com/uploads/7/7/4/6/77464738/ijcmr_3353.pdf)
  - (20) Kintan DR, Wahyuningsih HP, Setiyawati N. Factors Affecting Anaemia among Pregnant Women in Tegalrejo Public Health Center. Adv Heal Sci Res [Internet]. 2018; Available from file:///C:/Users/Ummu Nida Ilwihda/Downloads/125921316.pdf