Proceeding of The International Conference of Inovation, Science, Technology, Education, Children, and Health

E-ISSN: **2776-9062**

Research Article

The Relationship Between Adherence to Taking Iron Supplement Tablets and Complications in Mothers

Rani Safitri [1]*, Nila Widya Keswara [2], Rosyidah Alfitri [3]

[1,2,3] Program Sarjana Kebidanan, Fakultas Ilmu Kesehatan, Institut Sains dan Teknologi Kesehatan, RS dr. Soepraoen, Malang, Indonesia
Email : rani@itsk-soepraoen.ac.id

* Corresponding Author : Rani Safitri

Abstract: Iron deficiency anemia remains a significant health issue among pregnant women in Indonesia and is one of the contributing factors to high maternal and infant mortality rates. The prevalence of iron deficiency anemia in Indonesia has reached 50.5%. According to data from the 2010 National Health Survey, the anemia rate among pregnant women was 40.1%. Anemia during pregnancy increases the risk of low birth weight (LBW) babies, bleeding before and during labor, and can even lead to maternal and neonatal death. The purpose of this study was to determine the relationship between adherence to iron supplement tablet consumption and complications during labor and in neonates. This research used an analytic observational method with a retrospective cohort approach. The study involved 56 maternity mothers who met the inclusion and exclusion criteria, selected through purposive sampling. Data were analyzed using the Fisher's exact test. The results of the cross-tabulation between compliance with iron supplement tablet (TTD) consumption and maternal complications showed a p-value of 0.387 ($p > 0.05$), while the relationship between TTD compliance and neonatal complications showed a p-value of 0.681 ($p > 0.05$). It can be concluded that there is no significant relationship between adherence to iron supplement tablet consumption and the occurrence of maternal or neonatal complications.

Keywords: Blood Additive Tablet, Complication, Delivery Mother, Neonate

Received: April 16, 2025
Revised: May 12, 2025;
Accepted: June 19, 2025
Published : June 30, 2025
Curr. Ver.: June 30, 2025

1. INTRODUCTION

Iron deficiency anemia remains one of the health problems faced in Indonesia, and it is a major contributing factor to the high rates of maternal and infant mortality. According to the 2014 WHO report, the prevalence of iron deficiency anemia in Asia was over 75%, and it was estimated that approximately 35–75% of pregnant women in developing countries and 18% in developed countries suffer from anemia. In Indonesia, the prevalence of iron deficiency anemia reached 50.5%. The 2018 Basic Health Research (Riskesdas) reported that 48.9% of pregnant women in Indonesia experienced anemia, with 84.6% of these cases occurring in the 15–24 age group.

Anemia causes a decrease in the amount of oxygen in the blood, which in turn reduces the oxygen supply to vital organs. This can have adverse effects on pregnant women, particularly during pregnancy, childbirth, and the postpartum period. The high incidence of anemia is closely related to inadequate intake of nutritious food, especially iron, among pregnant women. Iron is a vital mineral needed for the formation of hemoglobin. Iron deficiency can lead to impaired growth and development of body and brain cells. Anemia

results in symptoms such as fatigue, weakness, lethargy, and reduced stamina, making the body more susceptible to infection.

According to UNICEF, in 2019 the prevalence of low birth weight (LBW) in Southeast Asia was 14.9%, while in Indonesia it was 10%. Based on data from Riskesdas, the prevalence of LBW in Indonesia has shown a decreasing trend: 11.1% in 2010, 10.2% in 2013, and 6.2% in 2018. Low hemoglobin levels due to anemia cause chronic hypoxia, triggering a stress response in the body and increasing the circulation of corticotrophin-releasing hormone (CRH), which may lead to oxidative stress in the placenta. This condition can result in fetal growth restriction, low birth weight, and preterm labor.

Iron supplement tablets (IST) are one of the key interventions to prevent and treat anemia in pregnant women. The government has initiated anemia prevention programs through the supplementation of ferrous sulfate tablets. These tablets are given for 90 days starting from the first antenatal care (ANC) visit. The Ministry of Health recommends that pregnant women consume at least 90 iron tablets during their pregnancy. Of the 60 mg of iron consumed per tablet, about 6–8 mg can be absorbed by the body. If taken for 90 days, the total amount of iron absorbed would be approximately 720 mg from a total intake of 180 tablets. The iron requirement during pregnancy is estimated to be around 800–1040 mg.

Based on the background described above, the problem formulation in this study is to investigate the relationship between adherence to iron supplement tablet (IST) consumption and maternal as well as neonatal complications.

2. RESEARCH METHODS

This study was an analytical observational study using a retrospective cohort approach. The research was conducted at Palaran Samarinda Public Health Center in July 2021. The study population included all pregnant women who came to give birth at the facility. The research respondents were pregnant women who met the inclusion and exclusion criteria, totaling 34 participants.

The inclusion criteria were pregnant women who gave birth at the health center and were willing to be interviewed. The exclusion criteria were pregnant women who experienced bleeding before delivery and those who had previously received a blood transfusion during pregnancy.

Data were obtained through documentation and interviews. The instruments used in this study included an interview questionnaire, medical records, and the Maternal and Child Health Handbook (the pink book). Interviews were conducted to obtain data regarding the mother's adherence to iron tablet consumption, complications experienced during pregnancy and childbirth, and the condition of the baby at birth. Interviews were conducted via telephone using a structured questionnaire as a guide.

3. Result and Discussion

A total of 58 postpartum mothers were initially recruited for this study. Of these, 34 mothers met the inclusion and exclusion criteria. A total of 24 respondents were excluded for the following reasons: 8 respondents could not be contacted due to inactive phone numbers, 6 refused to be interviewed, 1 had received a blood transfusion during pregnancy, and 9 did not have hemoglobin (Hb) data in their medical records due to being immediately referred to a higher-level health facility.

Characteristic	N = 34
Age (years), Mean ± SD	**29,32 ± 6,43**
Latest Educational Background (%)	
Diploma	5 (14,7)
Primary School (SD)	4 (11,8)
Senior High School (SMA)	9 (26,5)
Junior High School (SMP)	16 (47,1)
Occupation (%)	
Housewife	28 (85,3)
Employed	6 (14,7)
Adherence to Iron Tablet Consumption (%)	
Adherent	18 (52,9)
Non-adherent	16 (47,1)
Maternal Complications (%)	
Present	6 (17,6)
Absent	28 (82,4)
Neonatal Complications (%)	
Present	7 (20,5)
Absent	27 (79,4)

The results of this study show that the average age of the respondents was 29.32 ± 6.43 years. Based on the respondents' education level, the majority had completed junior high school (47.1%). In terms of occupation, most respondents were housewives (85.3%). A total of 52.9% of respondents were adherent to iron tablet (TTD) consumption. Additionally, 17.6% of pregnant women experienced complications, while 20.6% of neonates had complications (Table 1).

A total of 18 pregnant women were compliant with iron supplement consumption, accounting for 52.9% (Table 1). This indicates that the majority of pregnant women in the study adhered to iron tablet consumption. This finding is in line with a study conducted by Malnurung in Medan, which reported that 52.5% of pregnant women adhered to iron tablet consumption during pregnancy. Adherence to iron supplementation is strongly influenced by a mother's awareness of the importance of maintaining health during pregnancy to prevent iron deficiency and anemia. Pregnant women who understand the significance of taking iron tablets are more likely to avoid anemia during pregnancy.

The results also show that 17.6% of pregnant women experienced complications. The pregnancy complications observed included prolonged labor in 2 mothers, and postpartum hemorrhage in 4 mothers. Bleeding during the third trimester of pregnancy can be caused by conditions such as placenta previa, placental abruption (solutio placentae), or vasa previa.

These types of bleeding can disrupt fetal and maternal circulation, leading to anemia and potentially resulting in hypovolemic shock.

Complication	Number (n=6)	Percentage (%)
Prolonged labor	2	33.3
Postpartum hemorrhage	4	66.7

Low hemoglobin levels also make pregnant women more susceptible to infections due to a weakened immune response, which affects the body's resistance to infection and impairs immune function, particularly by reducing the activity of natural killer cells. The infection mechanism disrupts the collagenolytic process, resulting in an imbalance in the production of Matrix Metalloproteinases (MMPs), which are enzymes produced by the extracellular matrix, including collagen, and this disruption inhibits MMP production.

The amniotic membrane responds to inflammation by becoming thinner and more prone to rupture. In this study, 20.6% of neonates experienced complications. The complications observed in newborns included low birth weight (LBW) in five babies and neonatal asphyxia in two babies.

Complication	Number (n=7)	Percentage (%)
Low Birth Weight (LBW)	5	71.4
Neonatal Asphyxia	2	28.6

The effects of anemia on perinatal outcomes vary, including low birth weight (LBW), preterm labor, and infants who are small for gestational age (IUGR). Low hemoglobin levels in anemia lead to chronic hypoxia, which activates the body's stress response and increases circulating levels of corticotropin-releasing hormone (CRH). In addition, elevated CRH levels can enhance oxidative stress in the placenta, potentially resulting in fetal growth restriction, low birth weight, and preterm labor.

Compliance	With Complications	%	Without Complications	%	Total	%	p-value	RR (95% CI)
Non-Compliant	4	66.7%	12	42.9%	16	47.1%		
Compliant	2	33.3%	16	57.1%	18	52.9%		
Total	6	17.7%	28	82.3%	34	100%	0.387	2.25 (0.47–10.69)

The results of the analysis regarding the relationship between iron tablet compliance and maternal complications showed that out of 16 pregnant women who were non-compliant in taking iron supplements, 4 (66.7%) experienced pregnancy complications. Meanwhile, among the 18 pregnant women who were compliant, only 2 (33.3%) experienced complications.

This finding is not consistent with a study conducted in Nigeria in 2020, which investigated the effects of iron-deficiency anemia in pregnant women. That study found a significant association between iron-deficiency anemia during pregnancy and increased risk of adverse peripartum outcomes. For instance, pregnant women with iron-deficiency anemia

were found to be 6 times more likely to require blood transfusion compared to non-anemic women (p = 0.001), and had a higher incidence of postpartum fever (p = 0.041) and wound infections (p = 0.020).

Anemic patients tend to tolerate blood loss poorly, making them more likely to become hemodynamically unstable even with levels of blood loss that would not typically be harmful in non-anemic patients. Iron-deficiency anemia has also been associated with increased susceptibility to infections, as iron plays a key role in immune surveillance, including cell-mediated immunity and cytokine function. Statistically significant associations have been found between maternal infections—such as puerperal fever and wound infections—and iron-deficiency anemia.

The lack of association found in this study may be due to several factors. For example, pregnant women who were non-compliant with iron supplementation and developed anemia might have been referred to higher-level health facilities, where improved delivery management helped reduce maternal complications after childbirth.

4. Conclusions

The results of this study showed no association between compliance with iron tablet (TTD) consumption and maternal delivery complications.

References

Abu-Ouf NM, Jan MM. The impact of maternal iron deficiency and iron deficiency anemia on child's health. Saudi Med J. 2015;36(2):146–9.

Ajepe AA, Okunade KS, Sekumade AI, Daramola ES, Beke MO, Ijasan O, et al. Prevalence and foetomaternal effects of iron deficiency anaemia among pregnant women in Lagos, Nigeria. PLoS One [Internet]. 2020;15(1):1–13. Available from: http://dx.doi.org/10.1371/journal.pone.0 227965

Amini A, Pamungkas CE, Harahap APHP. Usia Ibu Dan Paritas Sebagai Faktor Risiko Yang Mempengaruhi Kejadian Anemia Pada Ibu Hamil Di Wilayah Kerja Puskesmas Ampenan. Midwifery J J Kebidanan UM Mataram. 2018;3(2):108.

Anggraini DD, Purnomo W, Trijanto B. Effect of pregnant women's knowledge and therapy regimentation towards compliance in consuming iron (Fe) tablets and anemia degree in South Kediri Public Health Center year 2016. Maj Obstet Ginekol. 2018;24(2):61.

Anlaaku P, Anto F. Anaemia in pregnancy and associated factors: a cross sectional study of antenatal attendants at Sunyanio Municipal Hospital Ghana. Bio med Cent. 2017;402(10).

Cunningham FG, Leveno KJ, Bloom SL, Hauth JC, Rouse DJ. Obstetri Williams. Jakarta: EGC; 2015.

Kasminawati K, Hakim BHA, Tahir AM. Status Gizi Dan Riwayat Komplikasi Kehamilan Sebagai Determinan Kejadian Komplikasi Persalinan Di Kab. Mamuju. Media Kesehat Masy Indones [Internet]. 2015;11(2):99–107. Available from: http://journal.unhas.ac.id/index.php/mk mi/article/view/536

Kementerian Kesehatan Republik Indonesia. Profil Kesehatan Indonesia 2014. Jakarta: Departemen Kesehatan Republik Indonesia; 2014.

Kusumawardani N, Darmawan E, Damayanti KW, Ahmad NFS. Kepatuhan Mengkonsumsi Suplemen Zat Besi Berpengaruh Terhadap Kejadian Anemia Pada Kehamilan. Indones Pharm Nat Med J. 2020;4(2):21–33.

Manurung HY. Hubungan Kepatuhan Konsumsi Tablet Tambah Darah (TTD) dan Pemeriksaan Kehamilan dengan Kadar Hemoglobin Ibu Hamil di Puskesmas Ambarita Kab Samosir. Universitas Sumatera Utara; 2018.

Paramita BF. Hubungan Kadar Hemoglobin pada Ibu di Trimester III Kehamilan dengan Kejadian Perdarahan Postpartum di RSUP Haji Adam Malik Medan. Universitas Sumatera Utara; 2019.

Putri NM. Hubungan Anemia Dalam Kehamilan Dengan Kejadian Ketuban Pecah Dini Pada Ibu Bersalin Di RS PKU Muhammadiyah Bantul Tahun 2017

Putri UR. Hubungan Antara Kadar Hemoglobin Ibu Hamil pada Trimester Ketiga dengan Antropometri Bayi Baru Lahir di RSPAD Gatot Soebroto DITKESAD [Internet]. UIN Syarif Hidayatullah Jakarta. Universitas Islam Negeri Syarif Hidayatullah Jakarta; 2014. Available

Ratnawati L, Siswishanto R, Emilia O. Hubungan Anemia dalam Kehamilan Trimester Tiga Terhadap Kejadian Bayi Kecil untuk Masa Kehamilan (KMK) di RS Dr. Sardjito. J Kesehat Reproduksi. 2015;2(3):153–62.

Ulfa MHM. Hubungan Kadar Hemoglobin Maternal dengan Luaran Perinatal di RS PKU Muhammadiyah Surakarta Tahun 2011. J Chem Inf Model. 2013;53(9):1689– 99.

World Health Organization, Stoltzfus RJ, Dreyfuss ML. Prevention of Iron Deficiency Anaemia in Adolescents Role of Weekly Iron Acid Supplementation [Internet]. Vol. 138, International Nutritional Anemia Consultative group (INACG). 2013. 46 p. Available