THE RELATIONSHIP CONSUMPTION OF FE TABLET DURING PREGNANCY IN MOTHER IN LABOR AN ANTROPOMETRY OF NEWBORNS

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Abstract

Data from the Directorate General of Public Health shows that the neonatal mortality rate in Indonesia reaches 9.30 per 1,000 live births, with the most common causes being low birth weight (LBW) at 34.5% and asphyxia at 27.8%. This is related to maternal hemoglobin levels during pregnancy. The increase in red blood cell volume that is not proportional to the increase in plasma volume causes a decrease in hemoglobin and hematocrit, thus reducing the fulfillment of nutritional needs for the fetus. Providing Fe tablets to mothers during pregnancy can prevent anemia in the mother and optimize fetal growth. This study was conducted to determine whether there is a relationship between the consumption of Fe tablets during pregnancy and the anthropometry of newborns. This research is quantitative with a cross-sectional analytical design. The research sample of 33 mothers in labor taken by accidental sampling technique. Data were analyzed using chi-square statistical test. From the analysis result, it was found 54.4% of respondents consumed of Fe Tablet according to the rules, 100% had normal birth weight, 81.8% had normal birth length, 63 had normal birth head circumference. The results of the chi-square test obtained a *p value* of Fe Tablet consumption against normal birth weight of 0.008, *p value* of Fe Tablet consumption against normal birth length of 0.051 and *p value* of Fe Tablet consumption against normal birth head circumference of 0.000. The conclusion obtained was that there was a relationship between consumption of Fe tablet during pregnancy and newborn weight and newborn head circumference, but there was no relationship between consumption of Fe tablet during pregnancy and newborn head circumference.

Keyword : Consumption of Fe Tablet, Antropometry of Newborns

INTRODUCTION

The World Health Organization (WHO) states that neonatal mortality has decreased by 44% since 2000. Data from the Directorate General of Public Health (DITJENKESMAS) shows that the neonatal mortality rate in Indonesia is 9.30 per 1,000 live births, meaning that approximately 9-10 babies die before reaching one month of age (Syawalia and Abdullah, 2025).

The most common causes of neonatal death in Indonesia are low birth weight (LBW) at 34.5% and asphyxia at 27.8% (Husna et al., 2023). This is related to the mother's hemoglobin levels during pregnancy. Hemoglobin is an iron-rich protein. It has the ability to bind oxygen and form oxyhemoglobin in red blood cells, which also functions as a nutrient carrier throughout the body for both the mother and the fetus (Sibarani, 2021). Hemoglobin is an iron-rich protein. During pregnancy, plasma volume increases progressively from the 6th to 8th week of pregnancy and peaks at 32nd to 34th weeks (Novitiyanto, 2023). The increase in red

blood cell volume that is not commensurate with the increase in plasma volume causes a decrease in hemoglobin and hematocrit, thus reducing the fulfillment of nutritional needs for the fetus (Wibowo, 2021).

The formation of red blood cells or hemoglobin in the body requires iron (Fe), which can be obtained from food. However, under certain conditions, meeting iron (Fe) needs can be helped by taking iron tablets to prevent nutritional anemia, which ultimately affects fetal growth and development. In this regard administering iron tablets to mothers during pregnancy can prevent anemia in the mother and optimize fetal growth (Ministry of Health of the Republic of Indonesia, 2018).

One method used to assess intrauterine growth and development in newborns is anthropometry. Abnormal anthropometric measurements are considered a sign of inadequate growth and development (Putri A, et al., 2023)

The results of Ariani et al.'s research (2020) stated that the amount of iron tablet consumption during pregnancy did not show a significant relationship with the birth weight of babies in the working area of Puskemas Uabau, Kabupaten Malaka. While the results of the research by Ferdiansyah M, et al. (2023), stated that there was a relationship between adherence to taking iron tablets and the birth weight of babies at the UPT Puskesmas Gondosari, Kecamatan Gebog, Kabupaten Kudus. Based on the description above, researchers are interested in examining the relationship between Fe tablet consumption in term pregnant women and BBL anthropometry at PMB Rosita.

RESEARCH METHODS

This research uses a quantitative type of research with an analytical design, using a cross sectional design. The research was carried out at BPM Rosita The population was all mothers who gave birth between June and July, with a sample size of 33 people using accidental sampling.. The variables in this research are Consumtion of Ioan Tablet as the independent variable and Anthropometri (Birth weight, birth length and birth head circumference) as the dependent variable. The data used is primary data. Data processing was carried out using univariate and bivariate analysis with the chi-square test

RESEARCH RESULTS

Univariate analysis was conducted on both independent and dependent variables to determine the frequency distribution of each characteristic and variable studied. The results are presented in the following table

Tabel 1. Distribution of the Frequency of Consumption of Fe Tablets During Pregnancy in Women Giving Birth at PMB Rosita, Pekanbaru City

Konsumsi Tablet Fe	Frekuensi (N)	Persentasi (%)
Sesuai Aturan (≥ 90 tablet) Selama Kehamilan	18	54.5
Tidak Sesuai Aturan (< 90 tablet) Selama Kehamilan	15	45.5
Total	**33**	**100.0**

Source: primary data

From table 1 it can be seen that the majority of respondents consumed iron tablets according to the rules (> 90 tablets) during pregnancy, as many as 18 people (54.5%), while 15 people (45.5%) did not consume iron tablets according to the rules (< 90 tablets).

Tabel 3. Frequency Distribution of Newborn Weight at Rosita PMB Pekanbaru City

Berat Badan Bayi	Frekuensi (N)	Persentasi (%)
Normal (BB > 2.500 grm)	33	100.0
Total	**33**	**100.0**

Source: primary data

From table 3 it can be seen that the weight of all newborn babies is normal, namely more than 2,500 grams

Tabel 4. Frequency Distribution of Newborn Lengths at Rosita Child Health Center in Pekanbaru City

Panjang Badan Bayi	Frekuensi (N)	Persentasi (%)
Normal (≥ 48 cm)	27	81.8
Tidak Normal (< 48 cm)	6	18.2
Total	**33**	**100.0**

Source: primary data

From table 4 it can be seen that the majority of respondents had a newborn baby length in the normal category, as many as 27 people (81.8%), while 6 people (18.2%) had a newborn baby length that was not normal

Tabel 5. Frequency Distribution of Head Circumference of Newborns at Rosita Child Health Center in Pekanbaru City

Lingkaran Kepala Bayi	Frekuensi (N)	Persentasi (%)
Normal (LK ≥ 33 cm)	21	63.6
Tidak Normal (LK < 33 cm)	12	36.4
Total	**33**	**100.0**

Source: primary data

From table 5 it can be seen that the majority of respondents had a newborn baby head circumference in the normal category, as many as 21 people (63.6%), while 12 people (36.4%) had an abnormal head

Tabel 6 The Relationship between Consumption of Fe Tablets during Pregnancy in Mothers in Labor and Birth Weight at PMB Rosita, Pekanbaru City

Variabel	Berat Badan			*p value*
	Normal	Tidak	Total	
	n(%)	n(%)	n(%)	
Konsumsi Tablet fe				
Sesuai Aturan (≥ 90 tablet) selama kehamilan	18(100)	0(0)	18(100)	**0.008**
Tidak Sesuai Aturan (<90 tablet) selama kehamilan	15 (100)	0(0)	15(100)	
Total	**33(100.0)**	**0(0)**	**33(100)**	

Source: primary data

Based on Table 6 above, it is known that of the 33 respondents who consumed iron tablets according to the instructions, all (100%) had normal body weight. The results of statistical tests using the chi-square test yielded a p-value of 0.008 < α 0.05. This indicates a relationship between iron tablet consumption during pregnancy in mother in labor and birth weight of infants at PMB Rosita, Pekanbaru City

Tabel 7 The Relationship between Consumption of Fe Tablets during Pregnancy in Mothers in Labor and Birth Length at PMB Rosita, Pekanbaru City

Variabel	Panjang Badan			*p value*
	Normal	Tidak	Total	
	n(%)	n(%)	n(%)	
Konsumsi Tablet fe				
Sesuai Aturan (≥ 90 tablet) selama kehamilan	17(94.4)	1(5.6)	18(100)	0.051
Tidak Sesuai Aturan (< 90 tablet) selama kehamilan	10 (66.7)	5(33.3)	15(100)	
Total	**27(81.8)**	**6(18.2)**	**33(100)**	

Source: primary data

Based on Table 7 above, it is known that of the 18 respondents who consumed iron tablets according to the instructions, 1 (5.6%) had an abnormal birth length. Of the 15 respondents who did not consume iron tablets according to the instructions, 5 (33.3%) had an abnormal birth length. The results of the statistical test using the chi-square test were 0.051 > α 0.05. This means that statistically, it can be concluded that there is no strong relationship between iron tablet consumption during pregnancy in mother in labor and birth length at PMB Rosita, Pekanbaru City

Tabel 8 The Relationship between Consumption of Fe Tablets during Pregnancy in Mothers in Labor and Birth Head Circunmfarance at PMB Rosita, Pekanbaru City

Variabel	Lingkar Kepala			*p value*
	Normal	Tidak	Total	
	n(%)	n(%)	n(%)	
Konsumsi Tablet fe				
Sesuai Aturan (≥ 90 tablet) selama kehamilan	16(88.9)	2(11.1)	18(100)	0.000
Tidak Sesuai Aturan (< 90 tablet) selama kehamilan	5 (66.7)	10(33.3)	15(100)	
Total	**21(63.6)**	**12(36.4)**	**33(100)**	

Source: primary data

Based on Table 4.7 above, it is known that of the 18 respondents who consumed iron tablets according to the instructions, 2 (11.1%) had an abnormal birth length. Of the 15 respondents who did not consume iron tablets according to the instructions, 10 (33.3%) had an abnormal birth length.

The results of the statistical test using the chi-square test with a p-value <α 0.05. This means that statistically, it can be concluded that there is a strong relationship between iron tablet consumption during pregnancy in mother in labor and birth length at the Rosita PMB Pekanbaru City

DISCUSSION

Univariate Analysis

Based on the results of research at PMB Rosita, it was found that the majority of respondents consumed iron tablets according to the rules (≥ 90 tablets) during pregnancy, as many as 18 people (54.5%), while 15 people (45.5%) did not comply with the rules (< 90 tablets). This indicates that the majority of pregnant women in their third trimester already have a good iron intake. Pregnant women in their third trimester are already receiving 90 iron tablets, which they are required to take daily throughout pregnancy. In addition to the iron tablets, pregnant women also receive additional vitamin C, taken with the iron tablets, to facilitate iron absorption.

Anthropometry is a method used to evaluate the size, dimensions, and composition of the human body. Anthropometric measurements in newborns are used as a basis for assessing the growth and development of the baby in the womb. Abnormal anthropometric measurements are considered a sign of not achieving optimal growth and development. Newborn anthropometric indicators are used to indicate the presence of growth disorders in the womb such as low birth weight (<2,500 grams), short birth length (<48 cm), and abdominal circumference that is disproportionate to head size. (Putri and Safaringga, 2023).

Fetal growth and development can be observed through weight gain and growth, body length, and brain development and other organs such as the heart, liver, and kidneys. Growth and development are measured directly on newborns. Measurements are taken systematically from head to toe, evaluating every system in the baby's body. The measurements aim to determine the baby's nutritional status at birth. Nutritional status is a determining factor in achieving optimal growth and development during infancy. Nutritional deficiencies that occur early in life can cause growth retardation (failure to thrive), make the baby shorter than normal, and affect cognitive development, as well as the baby's psychological development process in

motor skills, language, cognition, and socio-emotional aspects. A baby's nutritional status can be determined from anthropometric measurements, one of which is birth length. (Lestari et al, 2023)

Birth length reflects the baby's linear growth during pregnancy. A low linear measurement usually indicates malnutrition due to past energy and protein deficiencies, which can lead to slowed or retarded fetal growth. Inadequate maternal nutritional intake before pregnancy can lead to fetal growth disorders, which can result in the baby being born with a short birth length or fetal growth retardation, known as Intrauterine Growth Retardation (IUGR) (Rahmadi, 2016)

Head circumference monitoring is an assessment of a child's growth and development, indicating brain size and growth. According to the American Academy of Pediatrics, head circumference monitoring should be conducted until age 2. Head circumference is measured with a measuring tape, circling from the top of the eyebrows, past the top of the ears, and to the back of the head. (IDAI, 2017).

All babies born at Rosita Childcare Center (PMB Rosita) in Pekanbaru City were of normal birth weight, with no LBW. According to Ribka (2021), a normal birth weight indicates a baby's immune system at birth, while LBW babies have low immunity, making them susceptible to microbial infections. The vital organs in LBW babies are also not yet fully developed. Idha (2022) stated that the impact of low birth weight can affect a child's physical condition in adulthood, including slowed growth and development, leading to stunting. LBW children can experience decreased intelligence. Furthermore, long-term impacts can increase the risk of heart disease, obesity, and diabetes.

Bivariate Analysis

Based on the results of the study, it is known that there is a relationship between the consumption of iron tablets during pregnancy in mothers in labor and the weight of newborns, obtained a p value of 0.008 <α 0.05. There is no relationship between the consumption of iron tablets during pregnancy in mothers in labor and the length of newborns, obtained a p value of 0.051>α 0.05. There is a relationship between the consumption of iron tablets during pregnancy in mothers in labor and the head circumference of newborns, obtained a p value of 0.000 <α 0.05.

Iron deficiency is considered the primary nutritional factor underlying anemia. During pregnancy, pregnant women are advised to consume at least 90 iron tablets, as pregnant women are more likely to experience deficiencies in both folate and iron. Iron requirements increase for placental and red blood cell formation. These requirements are met through both diet and supplementation. Iron requirements are higher than the average intake absorbed by the body. Iron absorption depends on the food sources consumed (Aghadiati F, 2020)

Several factors influence a baby's birth size, including maternal nutritional intake during pregnancy and illnesses during birth. The poorer the mother's nutrition, the lower the baby's birth weight and length. Micronutrient deficiencies during pregnancy can cause the fetus to experience slower linear growth during the postnatal period. Fetal growth is highly dependent on metabolic products transferred through the placenta to meet the mother's needs during pregnancy and the fetus's nutrition for growth and development, ensuring a normal birth There is a clear relationship between maternal nutritional intake in the final months of pregnancy and the size of the baby. Most pregnant women who consume iron tablets experience anemia during pregnancy. This is because pregnant women who comply with iron consumption do not consider other factors that can cause anemia during pregnancy and ultimately impact

the risk of low birth weight babies. Iron plays a very important role in fetal growth, helping accelerate wound healing, especially wounds caused by the birth process. Therefore, mothers need to receive iron tablets from the beginning of pregnancy until the breastfeeding period (Hartiningrum & Fitriyah, 2018.

This research is in line with research by (Rezeki N et al., 2015), which found a significant relationship between adherence to taking iron tablets and birth weight of babies obtained p value = 0.011 other researchers found a significant relationship between folic acid and iron intake with birth weight of babies p <0.05. Rolfes' research found that 10.5% of pregnant women had insufficient iron intake, resulting in 2 low birth weight babies born from pregnant women who had insufficient iron intake

This study aligns with research by Rahman et al. (2024) that found no correlation between nutritional status and newborn length, with a chi-square correlation coefficient of 0.046. Iron deficiency results in smaller red blood cells and low hemoglobin levels. This low hemoglobin level results in suboptimal oxygen supply for metabolic processes.

This study is in line with research conducted by Antari et al. (2019), which found that babies born to mothers with anemia tend to have smaller birth head circumferences compared to children born to mothers who are not anemic. Statistically, the size of the newborn's head circumference obtained a p value = <0.001, which means there is a statistically significant difference. Another study by (Telatar, 2008) stated that severe anemia has a more significant relationship to infant anthropometry, including weight, body length, chest circumference, and head circumference of newborns compared to other levels of anemia severity

According to researchers, iron tablets are associated with birth weight and head circumference in newborns. Iron deficiency is a major contributing factor to anemia. Anemia in pregnant women can lead to impaired utero-placental nutrition and oxygenation, thus impairing the growth of the fetus, resulting in impaired and stunted fetal growth and developmen

CONCLUSION

There was a relationship between consumption of Fe tablet during pregnancy and newborn weight and newborn head circumference, but there was no relationship between consumption of Fe tablet during pregnancy and newborn head circumference. Thank you to the foundation and Rektor of the Institut Kesehatan Payung Negeri and the Bidan Rosita who have helped and facilitated the researchers so that this research was completed.

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