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DIFFERENCES IN HEMOGLOBIN LEVELS AND BODY WEIGHT OF THIRD TRIMESTER PREGNANT WOMEN BASED ON COMPLIANCE WITH IRON TABLETS AT CLINIC DENIAWATI IN 2021

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ARTICLE INFO

Keywords:

Hemoglobin level, body weight, adherence, iron tablets

ABSTRACT

Pregnancy is a special condition for a woman as a prospective mother because there will be physical changes that will affect her life during pregnancy. Diet and lifestyle can help the growth and development of the fetus in the mother's womb. (Irianto, 2015) The results of the 2018 Riskesdas show that the proportion of anemia in pregnant women from 2013 to 2018 has increased by 11.8%; in 2013, the proportion was 37.1%, and in 2018 the proportion was 48.9% (Riskesdas, 2018). This study aims to determine differences in hemoglobin levels and body weight of pregnant women in the third trimester based on adherence to iron tablets at the Deniawati Clinic in 2021. This study uses a comparative quantitative approach. This study's sample number was 26 pregnant women in the third trimester. The results showed a 2-way (t-tailed) significance value of 0.000 < 0.05 and 0.003 < 0.005. Conclusion this means that there are significant differences in the hemoglobin levels and body weight of pregnant women between obedient and non-adherent mothers taking iron tablets during pregnancy. This study recommends that further researchers need to conduct further research with different variables that are deeper.

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1. Introduction

The Maternal Mortality Rate (MMR) in the world is still high. Indonesia is in the top position with the highest number of maternal deaths compared to other ASEAN countries (Association of South East Asia Nations). The maternal mortality rate (MMR) in the world in 2014 was 289,000 people per 100,000 live births. Several countries have high maternal mortality rates (MMR), such as Sub-Saharan Africa with 179,000, South Asia with 69,000, and Southeast Asia with 16,000. Maternal Mortality Rate (MMR) in Southeast Asian countries were based on the 2018 Riskesdas in Indonesia, AKI was recorded at 305 per 100,000 live births, Vietnam 49 per 100,000 live births, Thailand 26 per 100,000 live births, Brunei 27 per 100,000 live births, and Malaysia 29 per 100,000 live births(WHO, 2014)

Incidence Mortality and morbidity in pregnant and maternity women are significant problems in developing countries. As in developing countries, about 25-50% of childbearing age deaths are caused by pregnancy-related issues. Death during childbirth is usually a significant factor in the mortality of young women at the peak of their productivity (Karwati, 2012).

The Maternal Mortality Rate (MMR) in Indonesia is still high. Data from the Ministry of Health in 2016 recorded 305 mothers died per 100,000 people. The Maternal Mortality Rate (MMR) has not yet reached the target of the Sustainable Development Goals (SDGs) in 2030, namely reducing the Maternal Mortality Rate (MMR) to less than 70 per 100,000 live births (Arma, 2017).

Based on the health profile of North Sumatra, the Maternal Mortality Rate (MMR) in North Sumatra was 2009 as much as 290 per 100,000 live births, in 2010, 2013 as 268 per 100,000 live births, in

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2016 as many as 240 per 100,000 live births. 100,000 live births, and in 2017 as many as 194 per 100,000 live births (Profile, 2015).

Pregnancy is a particular condition for a woman as a prospective mother because physical changes will affect her life during pregnancy. Diet and lifestyle can help the growth and development of the fetus in the mother's womb. (Irianto, 2015)

The high maternal mortality rate can also be associated with anemia. Low physical ability due to lack of oxygen in the body's cells is caused by anemia. Anemia can cause complications in pregnant women with the risk of maternal death, the rate of prematurity, low birth weight, and perinatal mortality will increase.

Anemia in pregnancy can increase the risk of childbirth complications such as premature birth, low body weight, fetal abnormalities, abortion, low intelligence, easy bleeding, and shock due to weak uterine contractions (Rahmawati, 2012).

Riskesdas 2018 show that the proportion of anemia in pregnant women from 2013 to 2018 increased by 11.8%; in 2013, the balance was 37.1%, and in 2018, the ratio was 48.9% (Riskesdas, 2018).

The effects of pregnancy with anemia include intrauterine growth retardation (IUGR), premature birth, low birth weight (LBW), and increased risk of neonatal death. The effects of anemia during pregnancy on the mother include shortness of breath, fatigue, palpitations, sleep disturbances. In addition, anemia in pregnant women can lead to complications and a high risk for miscarriage, bleeding, low birth weight, uterine atony, uterine inertia, retained placenta.

Wulandari's research (2018) shows that compliance in consuming Fe tablets has a very significant/powerful effect on Hb levels, and the rate of the relationship is positive/unidirectional. If pregnant women's compliance in consuming Fe tablets increases, the Hb levels will increase, with a proportion of the effect of 57,2%. The research of Sophia Sarah and Irianti (2017) showed significant results that there was an effect of the level of compliance of third-trimester pregnant women in consuming Fe tablets on the incidence of anemia.

The government's effort to overcome the lack of Hb levels in pregnant women is by giving 120 tablets of Multiple Micro Nutrient (MMN) or 90 iron tablets to pregnant women during pregnancy, which is enough to take 1 pill every day. So far, WHO has issued a policy to prevent anemia in pregnancy by providing supplements to pregnant women. The Indonesian government supports this by giving Government Regulation NUMBER 1457/MENKES/SK/X/2003 that pregnant women must consume iron every day for 90 days of pregnancy. (WHO, 2012).

The effects of pregnancy with anemia include intrauterine growth retardation (IUGR), premature birth, low birth weight (LBW), and increased risk of neonatal death. The effects of anemia during pregnancy on the mother include shortness of breath, fatigue, palpitations, sleep disturbances. In addition, anemia in pregnant women can lead to complications and a high risk for miscarriage, bleeding, low birth weight, uterine atony, uterine inertia, retained placenta.

One of the efforts made to reduce the prevalence of anemia is by giving 90 tablets of iron (Fe) during pregnancy. The percentage of pregnant women who received 90 iron tablets in North Sumatra in 2017 was 75.85%, an increase compared to 2016 (73.31%). With this percentage of coverage, the coverage of giving iron tablets during pregnancy has not been able to reach the national target set at 80% (SUMUT Health Profile, 2017)

The percentage of pregnant women who received 90 iron tablets in Langkat in 2017 was 78.69% and had not reached the national target set at 80% (Health Profile, 2017).

The main reasons pregnant women do not finish drinking and do not finish the blood-added tablets during pregnancy are dislike, nausea/vomiting due to the pregnancy process, boredom, forgetfulness. Compliance with consuming Fe tablets in pregnant women affects Hb levels. Obedience of pregnant women can be increased through assistance from the family and health workers' participation in providing information about the benefits of Fe tablets (Riskesdas, 2018).

Based on the Preliminary Study at the Deniawati Clinic, the number of pregnant women who received Fe tablets was from 38 pregnant women; 30 pregnant women received Fe tablets or 79% and have not achieved the national target set of 80%. Based on this description, researchers are interested in researching "The difference in hemoglobin levels and body weight of pregnant women in the third trimester based on adherence to consuming iron tablets at Deniawati Clinic, Stabat District in 2021."

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2. Method

This type of research uses a comparative quantitative approach, namely comparing the hemoglobin levels of pregnant women in the third trimester based on compliance with Fe tablet consumption and comparing the weight gain of pregnant women based on adherence to Fe tablet consumption.

The population in this study were all pregnant women in the third trimester who were examined at Deniawati Clinic; as many as 26 people were also the sample (total sampling). The researcher carried out the time of the study from January to March 2021. The research analysis used univariate and bivariate analysis. Univariate analysis was used to describe the data performed on each variable from the research results.

The researcher conducted a bivariate analysis to test whether there is a relationship between the independent/independent variable and the dependent/dependent variable. Bivariate analysis was conducted on two variables that were thought to be related or correlated. The data analysis method used an independent sample t-test with the help of the SPSS 17.0 program. In data analysis, two conditions must be met: the assumption test in the form of a normality test and a homogeneity test with SPSS 17.0 software tools

3. Result and Discussions

Univariate analysis

Univariate analysis was used to describe the data performed on each variable from the research results. The data is presented in the form of a frequency distribution table. Univariate analysis was carried out to see the frequency distribution of demographic data of age, education and occupation, Hb, and BW levels of pregnant women in the third trimester. The results of the univariate analysis are as follows:

Characteristics of Respondents

The description of the respondent's characteristics includes all demographic data taken, such as age, education level, and occupation.

Chart 4.1.

Distribution of Characteristics of Pregnant Women in the Third Trimester at Deniawati Clinic, Stabat sub-district (N=26)

No	Characteristics	n	%
1	**Age**		
	20-30	16	61,5
	31- 40	10	38,5
	Total	**26**	**100**
2	**Education**		
	Base (SD,SMP)	5	19,2
	Intermediate	15	57,7
	(SMA)	6	23,1
	High Level (D III, S1)		
	Total	**26**	**100**
3	**Work**		
	Does not work	16	61,5
	Work	10	34,5
	Total	**26**	**100**

Based on table 4.1 shows that most of the respondents are 20-30 years old, as 16

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respondents (61.5%), with secondary education as many as 15 respondents (57.7%), not working as many as 16 respondents (61.5%).

HB levels in third trimester pregnant women

Chart 4.2

Frequency distribution of hemoglobin levels in third trimester pregnant women at Deniawati Clinic, Stabat sub-district (N=26)

No	Hemoglobin level	n	%
1	Abnormal	2	7,7
2	Normal	24	93,3
Total		**26**	**100**

Based on Table 4.2, 24 respondents (93.3%) had normal HB levels, and two respondents (7.7%) had abnormal HB levels.

a. Third Trimester Pregnant Women Weight Gain

Chart 4.3

Frequency Distribution of Weight Gain in Third trimester pregnant women at Deniawati Clinic, Stabat sub-district (N=26)

No	Weight Gain	N	%
1	abnormal	4	15,4
2	Normal	22	84,6
Total		**26**	**100**

Based on Table 4.3, the average weight gain of pregnant women was 22 respondents (84.6%), and the abnormal weight gain was 4 respondents (15.4%).

The Compliance of Third Trimester Pregnant Women in Consumption of Fe Tablets

Chart 4.4

Distribution of the Frequency of Compliance of Third Trimester Pregnant Women in Consumption of Iron Tablets at Deniawati Clinic, Stabat sub-district (n=26)

No	Mother's Compliance with Fe Tablet Consumption	n	%
1	Not obey	5	19,2
2	Obey	21	80,3
Total		**26**	**100**

Based on Table 4.4, it was found that the compliance of pregnant women in consuming Fe tablets was 21 respondents (80.3%) and those who did not comply were 5 respondents (19.2%).

Bivariate Analysis

The researcher conducted a bivariate analysis to test whether there is a relationship between the independent/independent variable and the dependent/dependent variable. Bivariate analysis was carried out on two variables suspected to be related or correlated. The data analysis method used an independent sample t-test with the help of the SPSS 17.0 program.

Data Normality Test

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The normality test tests whether the dependent variable and the independent variable have a normal distribution in the regression model. To test whether the data is usually distributed or can be done with the Kolmogorov-Smirnov (K-S) parametric statistical test. The test was carried out to determine whether the data distribution was normal or not.

The data is usually distributed if the Asymp sig value is> 0.5.
a) If the value of Asymp sig <0.5, then the data is not normal
The test results with Kolmogorov-Smirnov (K-S) are as follows:

Chart 4.5
Normality Test Results with One-Sample Kolmogorov-Smirnov Test

Kolmogorov-Smirnov Z	N	Asymp.Sig (2-tailed)
1,164	26	0,133

In Table 4.5, it can be seen that the Asymp value. Sig. (2-tailed) is 0.133 and above the significance value (0.05), meaning that the residual data variable is normally distributed.

Homogeneity Test

The homogeneity test aims to determine whether the variation of some data from the population has the same variance or not. The basic guidelines for decision making in the homogeneity test are as follows:

If the value is significant or Sig < 0.05, then it is said that the variance of two or more data population groups is unequal (not homogeneous).

1) If the value is significant or si > 0.05, then it is said that the variance of two or more data population groups is the same (homogeneous). The homogeneity test in this study used ANOVA. The results of the homogeneity test of the research data are shown in table 4.6 below.

Chart 4.6
Homogeneity Test Calculation Results

	Levene Statistic	df1	df2	Sig.
Pregnant Women's Hemoglobin Level	3,761	1	104	,055
Weight gain for pregnant women	,291	1	104	,591

In table 4.6 column Levene Statistics obtained a significance value of 0.055. This shows that p = 0.055 > 0.05 and p = 0.591 > 0.05, so it can be said that the data comes from a homogeneous population.

Test Independent t-test

An independent t-test was used to determine differences in hemoglobin levels and body weight of pregnant women based on adherence to consuming iron tablets during pregnancy. After fulfilling the requirements, namely that the data is usually distributed and the information is homogeneous, the independent t-test can be carried out based on making decisions, namely:

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If the value of sig. (2-tailed) > 0.05 then Ho is accepted, and Ha is rejected, which means that there is no difference in the average levels of Haemoblobin and weight of pregnant women in the third trimester based on maternal compliance in consuming Fe tablets

Chart 4.7
Differences in Hemoglobin Levels of Pregnant Women in Trimester III Based on Compliance with Consuming Iron Tablets at Deniawati Clinic, Stabat sub-district (n=26)

Variable	N	Mean	Std. Deviasion	Sig.(2-tailed
Not obey	5	10,47	1,325	0,000
obey	21	11,87	0.939	

Table 4.7 shows differences in the average value of HB levels between the obedient and non-adherent groups taking Fe tablets. In the group of pregnant women who did not comply with taking Fe tablets, the mean value was 10.47. For the group of pregnant women who obediently took Fe tablets, the mean value was 11.87. This means that the average Hb level of pregnant women who adhere to Fe tablets is higher than that of mothers who do not comply with Fe tablets.

Based on table 4.7, it can be seen that the 2-way (t-tailed) significance value is 0.000 < 0.05. So it can be concluded that Ho is rejected and Ha is accepted. Thus, it can be supposed that there is a significant difference in hemoglobin levels of pregnant women between obedient and non-adherent mothers taking iron tablets during pregnancy.

Chart 4.8
Differences in Weight of Pregnant Women in Third Trimester Based on Compliance with Consuming Iron Tablets at Deniawati Clinic, Stabat sub-district (n=26)

Variabel	N	Mean	Std. Deviasion	Sig.(2-tailed
Not obey	5	12,22	1,899	0,003
obey	21	13,53	1,895	

Table 4.8 shows a difference in the average weight value between the obedient and non-adherent groups taking Fe tablets. In the group of pregnant women who did not comply with consuming Fe tablets, the mean value was 12.22. The group of pregnant women who obediently consume Fe tablets, the mean value is 13.53. This means that the average weight of pregnant women who obediently consume Fe tablets is higher than the weight of mothers who do not comply with taking Fe tablets. Based on table 4.8, it can be seen that the 2-way (t-tailed) significance value is 0.003 < 0.05. So it can be concluded that Ho is rejected and Ha is accepted. Thus, it can be supposed that there is a significant difference in the weight of pregnant women between obedient and non-adherent mothers taking iron tablets during pregnancy.

4. Discussion

Differences in hemoglobin levels based on adherence to iron tablet consumption

The results of this study are by the results of Wulandari's research (2018), which shows that adherence to consuming Fe tablets has a very significant/powerful effect on Hb levels, and the rate of the relationship is positive/unidirectional. If pregnant women's compliance in consuming Fe tablets increases, the Hb levels of pregnant women will increase. With a proportion of the effect of 57.2%.

The results showed a difference in the average value of HB levels between the obedient and non-adherent groups taking Fe tablets. In the group of pregnant women who did not comply with taking Fe tablets, the mean value was 10.47. For the group of pregnant women who obediently took

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Fe tablets, the mean value was 11.87. This means that the average Hb level of pregnant women who adhere to Fe tablets is higher than that of mothers who do not comply with Fe tablets.

A pregnant woman must take iron supplements during pregnancy because the iron needs of pregnant women increase during pregnancy. Since the gestational age of 10 weeks and reaches its peak in pregnancy between 32 and 36 weeks (third trimester) will increase blood in pregnancy. Mother's compliance in consuming iron will increase hemoglobin levels, preventing anemia. The consumption of iron tablets was obtained by calculating the remaining pills. Pregnant women are categorized as obedient if the compliance rate reaches 90%. On the other hand, pregnant women are disobedient if their compliance rate is less than 90%.

Pregnant women who adhere to Fe consumption will improve the quality of their pregnancy. Hb levels will increase by 1 g/dL within 1-2 months if pregnant women take 60 mg iron pills. Pregnant women's compliance is an essential factor in ensuring an increase in pregnant women's Hb levels. This study showed that pregnant women who consumed supplement tablets obediently experienced an average increase in hemoglobin levels of 11.85 gr %.

Mother's compliance in consuming iron is equivalent to drinking 60 mg of iron; it is expected that 6-8 mg of iron can be absorbed; if consumed for 90 days, the total absorbed iron is 720 mg and 180 mg of the mother's daily consumption. Iron in the ferrous form is more easily absorbed, so iron preparations for oral administration are available in various forms of various ferrous salts such as ferrous sulfate, ferrous gluconate, and ferrous fumarate. In Indonesia, iron pills commonly used in iron supplementation are ferrous sulfate; this compound is relatively inexpensive and can be absorbed up to 20%. Administration of 60 mg/day preparations can increase Hb levels by 1gr%/month. Currently, the national program recommends a combination of 60 mg iron and 50 nanograms of folic acid for anemia prevention. Thus, the higher the compliance of pregnant women in consuming Fe tablets, the higher the hemoglobin level and the lower the risk of pregnant women experiencing iron deficiency anemia and vice versa.

Differences in body weight based on compliance with iron tablet consumption Iron

(Fe) is one of the minerals that is a multiple micronutrient organic substance (MMN) needed by the body in smaller amounts than macronutrients. As one of the building blocks of hemoglobin, iron is a vital element whose amount must be kept in sufficient quantity (Bakta, 2015).

Pregnant women are one of the groups that are prone to anemia due to hemodilution events that occur during pregnancy. Multiple micronutrients are supplements containing multivitamins, iron, and folate given to pregnant women as one of the Indonesian Ministry of Health programs to prevent anemia during pregnancy.

From the study results, it was found that there was a difference in the average weight value between the obedient and non-adherent groups taking Fe tablets. In the group of pregnant women who did not comply with consuming Fe tablets, the mean value was 12.22. The group of pregnant women who obediently consume Fe tablets, the mean value is 13.53. This means that the average weight of pregnant women who obediently consume Fe tablets is higher than the weight of mothers who do not comply with taking Fe tablets.

This study is by the results of RD Rahayu (2016); namely, there is a significant difference in weight gain between before and after being given multiple micronutrients (MMN) contained in iron.

The incidence of anemia can be caused by malnutrition because the nutritional intake consumed by pregnant women is inadequate. Pregnant women need more nutrients in macronutrients (carbohydrates, proteins, fats) and micronutrients (iron, iodine, and vitamins). A poor diet during pregnancy will cause protein and vitamins to not be according to needs. Metabolism is not balanced, so that the formation of Hb is inhibited. The body's needs for macro and micro substances are not met, resulting in various nutritional problems and anemia. To anticipate these problems, pregnant women are expected to be obedient in consuming iron supplements as micronutrients that affect the weight gain of pregnant women so that they can increase the Hb levels of pregnant women.

5. Conclusion

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There is a significant difference in hemoglobin levels of pregnant women between obedient and non-adherent mothers taking iron tablets during pregnancy with a significance value of 0.000 < 0.05. There is a significant difference in the weight of pregnant women between obedient and non-adherent mothers taking iron tablets during pregnancy with a significance value of 0.003 < 0.05

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