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THE CORRELATION BETWEEN COMPLIANCE FE TABLETS CONSUMPTION AND TEA DRINKING HABITS WITH THE INCIDENCE OF ANEMIA IN PREGNANT WOMEN

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ABSTRACT

Anemia is a global health problem that often occurs in pregnancy. In Indonesia in 2019 the incidence of anemia in pregnant women increased to 44.2%. The aim of the study was to analyze the correlation between compliance Fe tablet consumption and tea drinking habits with the incidence of anemia in pregnant women in the working area of the Gang Kelor Bogor Public Health Center in 2023. This research was a quantitative study using a cross-sectional approach of 90 pregnant women respondents with a purposive sampling technique.Data collection using a questionnaire. The results of this study mean that the average age of 20-35 years is 73 people (81.1%) with tertiary education as many as 67 people (74.4%), housewives as many as 87 people (96.7%) and LILA in the Non KEK category as many as 68 people (75.6%) ,This study used the chi-square statistical test with a *p-value* (<0.05). The results of the chi-square test showed that there was no correlation between compliance Fe tablets consumption with the incidence of anemia by *p-value*was 0.084and there was no correlation betweentea drinking habits with the incidence of anemia by *p-value*was 0.213. It can be concluded that there wereno correlationbetween complianceFe tablets consumption with the incidence of anemia neither did tea drinking habits. Pregnant women may couldn't consume Fe tablets as long as they have enough nutritional needs. The habits of drinking tea may could be done by pregnant women. It suggested that pregnant women be more active in digging up information about anemia in pregnancy so that pregnant women are healthier and avoid anemia. Health workers to be more active in providing health education to the public regarding maternal health, especially about anemia in pregnancy from the start of the examination.

Keywords **:**Compliance Fe Tablets Consumption, Tea Drinking Habits, The Incidence of Anemia

Introduction

In improving Indonesia's health system, maternal and child health is a top priority. An assessment of health status and efforts made in maternal and child health programs are needed to determine the well-being of Indonesia's health system. The success of maternal and child health programs can be assessed from the indicators of the Maternal Mortality Rate (MMR) and Infant Mortality Rate (IMR).

Anemia is a global health problem that often occurs in pregnancy. This is caused by anatomical and physiological changes in pregnant women that occur in various aspects, including hormonal and hematological. During pregnancy, there is a significant increase in plasma volume relative to red blood cells, causing a decrease in the absolute number of red blood cells (Haemoglobin/Hb) to meet individual physiological needs. Usually, Hb concentration and hematocrit decrease in the first trimester and reach their lowest point in the 2nd trimester. Pregnant women are included in the highest risk group for anemia (Chaparro *et al.*, 2019)

The problem of anemia affects 56 million women throughout the country and 2/3 of Asian women experience anemia (Soh *et al*., 2015). The World Health Organization (WHO) in 2020 said that the prevalence of anemia in pregnant women is 40.1%. In Indonesia in 2019 the incidence of anemia in pregnant women increased to 44.2% (Riskesdas, 2018). The prevalence of anemia in pregnant women in Bogor City is 11.6% (Dinkes Kota Bogor, 2020).

Health efforts for pregnant women have been carried out by the government through the provision of antenatal care at least four times during pregnancy, with the hope of receiving a minimum of 90 iron tablets during pregnancy as well as simple laboratory tests, namely the Haemoglobin (Hb) test. However, even though the proportion of pregnant women who received iron tablets reached 73.2%, there was an increase in cases of anemia in pregnant women from year to year. Even if seen in more detail, only 38.1% received 90 or more iron tablets, while the rest only received less than 90 items (Kementerian Kesehatan RI, 2019)

Research conducted by Setiawati at the MenintingMataram Health Center in 2018 showed that health education about iron supplements in the class of pregnant women had a significant effect on compliance in consuming iron tablets (p=0.000). In addition to knowledge, adherence to taking iron tablets is also an important health behavior for pregnant women. A high level of adherence in taking iron tablets can help reduce the incidence of anemia in pregnant women. In Purnamasari's research at the Central Bogor Health Center in 2016, it was found that the level of compliance of pregnant women in consuming iron tablets was quite high, namely 50.9% (Purnamasari*et al*., 2016). However, the results of research by Dewi*et al* at the Gang Kelor Health Center in 2022 showed that most pregnant women were less compliant in taking Fe tablets, with only around 13% consuming iron tablets as much as or more than 90 tablets (Dewi*et al*., 2022).

Anemia often occurs in women who do not have adequate dietary intake or do not take iron supplements. The need for iron during pregnancy increases significantly to meet the needs of the fetoplacental unit, increase maternal red cell mass, and replace iron lost during labour. Lack of nutrition or absorption disorders is the main cause of iron deficiency anemia in pregnancy.Based on research by Setiawan (2018), the habit of drinking tea in pregnant women can cause anemia. This is supported by research by Choirunissa*et al*, 2019 which found that most pregnant women (67.8%) consumed tea and most of them (76.5%) experienced anemia.

Tea is a popular drink worldwide and is made from the dried leaves of Camellia sinensis. The composition of tea consists of various substances such as tannins, flavonols, proteins and amino acids, volatile substances, enzymes, vitamins, mineral compounds, and alkaloids. The tannins present in tea can reduce the availability of iron prior to absorption by forming insoluble mineral complexes. Several studies have shown that tea consumption may be related to anemia in pregnant women, such as research conducted by (Teshome *et al*., 2020) . However, different results were shown by the research by Temme*et al*, 2020 which stated that there was no correlation

between tea or tannin consumption and hemoglobin levels. The purpose of this study was to analyze the correlation between compliance Fe tablet consumption and thedrinking habits with the incidence of anemia in pregnant women in the working area of the Gang Kelor Health Center.

Method

The type of research used was quantitative research with an observational analytic design with a cross sectional approach. The design of study was correlational, which aims to determine two or more variables based on the correlation coefficient. This research was conducted from May 2023 to June 2023 in the working area of the Gang Kelor Health Center.

The population in this study were all pregnant women in the working area of the Gang Kelor Health Center in January - May 2023 with a total of 417 pregnant women. The sample in this study were pregnant women who lived in the working area of the Gang Kelor Health Center. The sample size in this study was calculated using the Slovin formula, namely:

$$n = N\ 1 + Ne\ 2$$

information :

n = Number of samples

N = Total population

e = 10% error tolerance (0.1)

It based on the slovin formula, the number of samples obtained was 81 pregnant women. The possibility of dropping out was 10% of the population,the number of samples was added by 8 so that a sample of 89 respondents is obtained which will be sampled in this study.

In this research, the technique used was purposive sampling. Prior to sampling, it was necessary to determine the inclusion and exclusion criteria. The inclusion criteria were residing in the working area of the Gang Kelor Health Center, Carrying out ANC examinations at the Gang Kelor Health Center, Pregnant women in the 2nd and 3rd trimesters, Pregnant women who had Hemoglobin checks in the last 2 months, Pregnant women who received iron supplement tablets. While the exclusion criterias were pregnant women with severe disease, pregnant women who moved places of residence.

The instrument use questionnaire form which content about characteristic subject. Questionnaire Form of Compliance Fe Tablets Consumption use a 10 questions to find out the extent of compliance Fe tablets consumption in pregnant women. Questionnaire Form of Tea Drinking Habitsused Food Frequency Questionnaire (FFQ), to identify how often did pregnant women drink tea and how much for one drink

Types and collection of data used was primary data were obtained directly from respondents by distributing questionnaires that had been tried out and filling out research questionnaires by respondents by filling out observation sheets for age, education and occupational and upper circumference of upper arm data then filling out compliance Fe tablets consumption and tea drinking habits questionnaires.The secondary data used the description of the Gang Kelor Health Center and cohort data of pregnant women who experience anemia.

Data collection used for request permission from the institution to submit research ethics, then ask permission from the Head of the Gang Kelor Health Center to conduct research, then select research respondents who meet the inclusion criteria, determine the questions to be asked in the questionnaire, then explain the research to be carried out and asked for their willingness to filled out a questionnaire given to 90 respondents. Then the questionnaire was filled out by the respondents themselves based on the attached instructions and guidance from the researcher. Completed forms and questionnaires were then collected to researchers and the data would be processed for research.

Data analysis used with data normality test was the purpose of the normality test is to find out the distribution of data. Researchers used the Kolmogorov-Smirnov normality test, because the number of research samples was > 50 respondents.

Univariate analysis was an analysis carried out on each variable from the results of the study, namely the independent variables (age, education, occupation, circumfrence of upper extremity, compliance Fe tablets consumption, tea drinking habit) and the dependent variable (the incidence of anemia). Bivariate analysis was conducted to determine the correlation between the two variables. In this study, a bivariate test was conducted he correlation between 2 variables, namely the correlation between compliance Fe tablets consumption, and tea drinking habits with the incidence of anemia. Analyzing data in a bivariate manner, data testing was carried out using chi square with a significant level of 95%.

Results

Univariate Analysis Results

Univariate analysis was carried out the display of the frequency distribution and percentage of each variable, namely age, education, and circumference of upper arm inpregnant women in the Gang Kelor Health Center area.

Table 1. Distribution of Respondent Characteristics based on Age, Education, Occupation and Upper Arm and Circumference

Variable	Category	N	%
Age	20 – 35 (No Risk)	73	81.1
	>35 (Risk)	17	18,9
Occupational	Work	3	3.3
	Doesn't work	87	96.7
Education	Low (Elementary/ Junior)	23	25.6
	High(Senior/College)	67	74.4
Upper Arm	Deficiency (<23.5)	22	24.4
Circumference	Normal (>23.5)	68	75.6
Hemoglobin Levels	Anemia (<11)	42	46.7
	Not Anemia (>11.1)	48	53.3
Compliance Fe Tablets	High	41	45.6
Consumption	Moderate	39	43.3
	Low	10	11.1
Tea Drinking Habits	Frequenly	12	13.3
Consumption	Rarely	78	86.7

Table 1 showed the age of pregnant women at the Gang Kelor Health Center of 90 people (100%), there were respondents who were at risk totaling 17 people (18.9%) and respondents who were not at risk totaling 73 people (81.1%). Education for pregnant women in the Gang Kelor Health Center areaout of 90 people (100%), there were 67 respondents (74.4%) who had a high education category and 23 respondents (25.6%) who had a low education category.

Table 1 showed the employment of pregnant women in the Gang Kelor Health Center area. Out of 90 people (100%), there were 3 respondents who had jobs (3.3%) and 87 respondents who did not have jobs (96.7%). There were respondents who had Upper Arm Circumference <23.5 totaling 68 people (75.6%) and respondents who had LILA (Upper Arm Circumference) ≥23.5 totaling 22 people (24.4%).Table 1 showed Hemoglobin levels in pregnant women in the Gang Kelor Health Center area. out of 90 people (100%), there were 42 respondents (46.7%) who had HB levels > 11.1 and 48 respondents (53.3%) who had HB levels ≤ 11.

Table 1 showed the compliance Fe tablets consumption by pregnant women in the Gang Kelor Health Center area. Out of 90 people (100%), there were 41 respondents (45.6%) who had compliance with the high category, 39 respondents (43.3) who had moderate compliance and 10 respondents who had low compliance (11.1%).Table 1 showed drinking tea habits consumption among pregnant women in the Gang Kelor Health Center area. out of 90 people (100%), there were 12 people (13.3%) who consumed tea frequently and 78 people (86.7%) who consumed tea rarely.

Bivariate Analysis

Table 2 Distribution of the correlation between Compliance Fe Tablets Consumption, tea drinking habits and the incidence of anemia in the Working Area of the Gang Kelor Health Center, Bogor

Table 2. The Correlation between compliance Fe Tablets consumption, drinking tea habits and the incidence of anemia in the Work Area of the Gang Kelor Health Center, Bogor

Variable	Category	Anemia events						*p*-values
		Not Anemia		Anemia		Total		
		n	%	n	%	n	%	
Compliance Fe Tablets Consumption	High	18	43.9	23	56.1	41	100.0	**0.084**
	Moderate	23	59.0	16	41.0	39	100.0	
	Low	1	10.0	9	90.0	10	100.0	
Tea Drinking Habits	Frequently	8	66.7	4	33.3	12	100.0	**0.213**
	Rarely	34	43.6	44	56.4	78	100.0	

Chi Square Test ,*p* – Value ≤ 0.05

(Source : Primary Data 2023)

The results of the analysis showed that most respondents had high adherence to compliance Fe tablets consumption with the incidence of anemia was 56.1%, moderate compliance with the incidence of anemia was41.0% and low compliance with an incidence of anemia was 90.0%. The results of the chi squaretest showed that there was no significant correlation between compliance with the incidence of anemia, this was evidenced by a *p-value*> 0.05 (*p-value* = 0.084).

The results of the analysis were obtained for the most respondents which tea drinking habitsfrequenlywho did not have anemia was 66.7% and tea drinking habits rarely did not have anemia was 43,6%. The chi squaretest results showed that there was no significant correlation between tea drinking habits and the incidence of anemia, this was evidenced by a *p-value*> 0.05 (*p-value* = 0.213).

Discussion

Based on the results of the study in Table 2 aboutCompliance Fe tablets consumption with the incidence of Anemia,*P-value of* 0.084was obtained, meaning that there is no significant correlation between compliance Fe tablet consumption and the incidence of anemia, this is evidenced by a *p-value*> 0.05 (*p-value* = 0.084), which means that hipothesis was rejected.Based on the results of the study in Table 2, there were 90 respondents, 41 people (45.5%) had high compliance, 39 people (43.3%) moderate compliance and 10 people (11.1%) low compliance.

Anemia that often occurs in pregnant women is anemia due to iron deficiency (Fe) or known as iron nutritional anemia (AGB). About 95% of cases of anemia during pregnancy are due to iron deficiency. Compliance with blood supplement consumption is an important factor in the treatment

of anemia in pregnant women, because by following the recommendations for proper and consistent use, pregnant women can ensure their intake of iron and other important nutrients needed to increase hemoglobin levels and overcome anemia, thereby helping to maintain health. mother and fetal development.

This is supported by the results of statistical tests using the chi-square test obtained p value = 1.000 > 0.005 meaning that there is no significant correlation between consumption of Fe tablets and the incidence of anemia in pregnant women (Helga *et al*., 2022). This is in line with Apriliani, Avianty and Nauli's research in 2021 which showed that there was no correlation between consumption of Fe tablets and the incidence of anemia in pregnant women as indicated by a p value = 0.570 <0.005 (Aprilian*iet al*., 2021).

As many as 22 subjects (38.6%) did not adhere to consuming Fe tablets because they forgot. The results of this study are in line with research conducted by Sarah *et al* (2018)) which stated that as many as 9 subjects (40.9%) were disobedient in (Sarah *et al*, 2018)taking Fe tablets because they forgot (Sarah *et al*, 2018). Another study conducted by Purnamasari (2016) states that pregnant women do not regularly consume Fe tablets every day because of boredom which causes pregnant women to be lazy and forget to take Fe tablets.From the above conclusions, respondents with high adherence only comply to consume but do not understand the importance of consuming Fe tablets and the correct procedure for taking fe tablets.

Based on the results of the study in Table 2about Tea drinking habits with the incidence of anemia, there were 90 respondents, 78 people (86.7%) rarely drank tea and 12 pregnant women (51.1%) consumed tea frequently. While in Table 2, there were difference in the proportion between the anemia variable and the habit of consuming tea rarely as many as 44 people (56.4%) and the habit of consuming tea frequently as many as 4 people (33.3%).

*p-value*of 0.213 is obtained, meaning that there is no significant correlation between tea drinking habits in pregnant women and the incidence of anemia is evidenced by a *p-value*> 0.05 (*p-value* = 0.213), which means that hipothesis is rejected. This is supported by Meloryslestari P's 2017 study which stated that there was no correlation between tea drinking habits with the incidence of anemia in pregnant women with a value (p value 0.0953) (Purwaningtyas&Prameswari, 2017).

And supported byNovelia's research (2022) the results of the chi-square test were obtained with a value (p = 0.245), which means that there is no correlation between the habit of drinking tea and the incidence of anemia in pregnant women(Noveli*aet al*., 2022)

Intake of vitamin C helps the absorption of iron in the body of pregnant women. The presence of iron absorption inhibitors or inhibitors that are often consumed by pregnant women such as caffeine, tannins (in tea), oxalate, phytate can inhibit the absorption of iron in the body, causing iron deficiency anemia. The habit of drinking tea has become a culture for the world's

population. In addition to water, tea is a drink that is widely consumed by humans. The average consumption of tea by the world's population is 120 ml/day per capita (Besral*et al*, 2007). The habit of drinking tea in pregnant women can increase the risk of pregnancy complications and can interfere with the absorption of nutrients.

Based on the research that has been done, the results of the FFQ show that there are 4 types of tea drink categories, namely bagged tea, sachet tea, processed tea, and packaged tea. Of the 90 respondents who consumed tea bags, there were 58 respondents with an average serving of the brand Sariwangi tea with a portion of 185 ml, of the 90 respondents who consumed sachet tea, there were 22 respondents who consumed the tea juice brand on average, of the 90 respondents who were pregnant women who consuming processed tea, there were 36 respondents with an average brand of ice tea pot with a portion of 340 ml and of the 90 respondents who consumed packaged tea, there were 51 respondents on the tea box brand with a portion of 300 ml.

This allows the absorption of iron in the body due to pregnant women drinking tea before and after eating with an interval of 1 to 2 hours and causing a decrease in iron (Fe). The habit of drinking tea is at risk of experiencing anemia 2.785 times greater than that of pregnant women who never drink tea, due to the presence of iron absorption inhibitors or inhibitors that are often consumed by pregnant women such as caffeine, tannins, oxalate, phytate which can inhibit the absorption of iron in the body. . These inhibitor substances must be avoided because these substances bind iron so that it cannot be absorbed.

Conclusion

Based on the results of the research and discussion regarding the correlation of compliance Fe Tablets Consumption and tea drinking habits with the incidence of anemia in pregnant women in the Gang Kelor Community Health Center area, it can be concluded as follows:

1. The location of the Gang Kelor Health Center has the status of being a main Health Center by fostering 3 (Three) Menteng, West Cilendek, and East Cilendek Villages. As well as the Kelor Gang Health Center assisted by a Subsidiary Health Center, namely PuskesmaspembantuCilendek Timur
2. Characteristics of respondents, out of 90 respondents aged 20-35 years, 73 people (81.1%), most of them had high education, 67 people (74.4%), most of the mothers were housewives, 87 people (96.7%)) and the largest number of mothers in the Calories and Energy Deficiency category were 22 people (24.4%)
3. Compliance of pregnant women for Fe Tablets consuption had high one of 41 people (45.6%), moderate compliance of 39 people (43.3%) and low compliance of 10 people (11.1%).

4. Habits of tea drinking in pregnant women were rare, namely as many as 78 people (86.7%) and frequently tea drinking, as many as 12 people (13.3%).
5. There was no significant correlation between compliance Fe tablets consumption with the incidence of anemia in pregnant women (*p*-value = 0.084)
6. There was no significant correlation between compliance tea drinking habits with the incidence of anemia in pregnant women (*p*-value = 0.213)

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