# Analysis Of Uric Acid Levels In Pre-Elderly Patients In Terms Of Coffee Drinking Behavior In The Work Area Of The Cikeusal Health Center, Serang Regency In 2022

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***Abstract***.
*The World Health Organization (WHO) states that hyperuricemia sufferers are increasing every year in the world. The Cikeusal Health Center in Serang Regency shows that cases of hyperuricemia are quite high, namely as many as 189 in 2020, increasing in 2021, namely 340, even in 2022 in the January-September period there were 208 cases. One of the pharmacological treatments in the treatment of hyperuricemia is coffee because it contains polyphenolic compounds. Purpose of Writing was to knowing the analysis of uric acid levels in pre-elderly patients in terms of coffee drinking behavior in the working area of the Cikeusal Health Center, Serang Regency, in 2022. Research Methods on this research is a quantitative analytic study with a cross sectional design. The sample in this study were pre-elderly patients who visited the Cikeusal Health Center in Serang Regency in August-October 2022 with a total of 81 respondents using a purposive sampling technique. The research instrument used questionnaires and observation sheets. The data is primary data analyzed using the one way ANOVA test which previously had been carried out the normality test with normal data distribution results. The results of univariate analysis revealed that the average uric acid level was 4.786, coffee drinking behavior was low, medium and high respectively 33.3% with an average of 21.07. The results of the bivariate analysis revealed that there was an effect of coffee drinking behavior on uric acid levels with a p value = 0.021. Coffee drinking behavior affects uric acid levels in pre-elderly patients. It is hoped that the community can carry out routine checks and maintain food intake, one of which is drinking coffee regularly between 1-2 times a day.*

***Keywords***: *Coffee drinking behavior, uric acid levels and pre-elderly patients.*

## I. INTRODUCTION

Uric acid is the end result of purine metabolism (adenine and guanine) produced in tissues containing the enzyme xanthine oxidase mainly in the liver and small intestine. The source of uric acid in humans is found in endogenous and exogenous processes. Endogenous processes occur naturally in the human body from the de novo synthesis and breakdown of nucleic acids, while exogenous processes originate from the intake of foods containing purines (Choi, 2018). Excessive increase in uric acid is also caused by excess uric acid formation in the body or inhibition of uric acid removal by the body (Lelyana, 2018). referred to as hyperuricemia if male adult uric acid levels are more than 7.0 mg/dl and more than 6.0 mg/dl in women (Angelina, 2019).The World Health Organization (WHO) states that people with hyperuresemia are increasing every year in the world. The increase also occurred in developing countries, one of which was in Indonesia. The incidence rate of hyperuresemia is about 1-4% of the general population, in western countries men suffer from hyperuresemia higher compared to women by 3-6%. In some countries, prevalence can increase by 10% in men and 6% in women in the age range of ≥80 years. The incidence of hyperurecemia is 2.68 per 1000 people (Arlinda, et al. 2021).In developing countries such as Indonesia, cases of gout every year have increased. This is supported by Riskesdas data in 2018, the prevalence of hyperuresemia in Indonesia reached 7.3%, the disease occurred at the age of 45-54 years as much as 11.8%, 55-64 years as much as 15.55%, 65-74 years as much as 18.63% and > 75 years as much as 18.95%. There were more female sufferers (8.46%) compared to men (6.13%).

(Ministry of Health RI, 2019).Meanwhile, in Banten Province, the prevalence of hyperuresemia reached 6.15%, Serang Regency is the regency with the third highest prevalence (6.52%) after South Tangerang City (7.53%) and Serang Regency (6.71%). The disease occurs at the age of 45-54 years as much as 10.85%, 55-64 years as much as 15.73%, 65-74 years as much as 16.89% and > 75 years as much as 20.31%. There are more female sufferers (7.66%) compared to men (4.68%) (Riskesdas Team, 2019).Some of the risk factors for people with hyperuricemia include gender, obesity, lack of exercise and a diet of foods high in

purines. An increase in uric acid levels in the blood (hyperuricemia) is caused by an increase in production (overproduction), a decrease in the production (underexcretion) of uric acid through the kidneys, or a combination of the two (Bendersky, 2019). Chronic inflammation due to uric acid crystals results in pain, pain and stiffness as well as enlargement and protrusion of swollen joints. The impact that occurs if you experience hyperuricemia can damage the kidneys so that they can experience kidney failure, hyperlipoproteinemia, diabetes mellitus, stress, lead poisoning, leukemia, metastatic carcinoma, multiple myeloma, and dehydration due to the use of diuretics (Sustrani, et al., 2020). One of the pharmacological treatments in the treatment of hyperuricemia is allopurinol, which works to inhibit the activity of the enzyme xanthine oxidase. The most effective nonpharmacological management of hyperuricemia is the reduction of consumption of foods high in purines. Coffee, one of the drinks that is known to be low in purines is one of the most popular drinks in Indonesia (Utami, 2019). Coffee consumption has a positive effect on the body can reduce uric acid levels because coffee contains polyphenol compounds (Chlorogenic Acid) which can inhibit the work of xanthine oxidase (Sunita, 2019).

The body consumes coffee with polyphenol compounds, then the body will get these antioxidants. The content of coffee (polyphenols) that has been identified as an antioxidant is chlorogenic acid (Welkriana, et al., 2018). This compound is able to inhibit the work of xanthin oxidase, if the work of the xanthin oxidase enzyme is inhibited, the formation of uric acid in the body will decrease (Sunita, et al., 2019). Coffee also has negative effects, including disrupting iron absorption, causing iron deficiency anemia, peptic ulcer, erosive esophagitis, and gastroesophageal reflux (Dewajanti, 2019).Welkriana's research (2018) on the effect of coffee drinking frequency on blood uric acid levels is concluded to have a real influence on uric acid levels. The habit of drinking coffee with a heavy frequency (more than 4 cups per day) is able to reduce blood uric acid levels. Sunita's research (2019) on lower uric acid levels in subjects consuming coffee compared to not consuming coffee concluded that uric acid levels in people who consumed coffee were lower than those who did not consume coffee. Lelyana's (2018) research on the effect of coffe daily consumption on uric acid and body weight to prevent metabolic syndrome concluded that drinking 0.72ml of coffee daily (equivalent to 2 cups of coffee in humans) for 14 days could lower uric acid levels in obese rats although not significantly. Another study conducted by Khotimah, et al. (2018) on the effect of coffee drinking habits on uric acid levels and cholesterol levels in black coffee drinkers in Pijot Village, East Lombok Regency, showed that the average uric acid level before drinking black coffee was 6.3667 mg / dl, the average uric acid level after drinking black coffee was 6.2233 mg / dl, it can be concluded that the influence of black coffee drinking habits can reduce blood uric acid levels due to the presence of polyphenol compounds.

Rismawati (2021) about the description of uric acid levels in coffee drinking students showed the results of uric acid levels in coffee drinking students 1-2 times a day and > 4 years have normal uric acid levels of 94% with an average of 3.6 mg / dl.The results of a preliminary survey of the Cikeusal Health Center in Serang Regency show that hyperuricemia cases are quite high, namely 189 in 2020, increasing in 2021, namely 340, even in 2022 in the January-September period there were 208 cases. Based on data on uric acid levels from the Cikeusal Health Center, Serang Regency, which consumes black coffee, especially those who have consumed it for a long time, there have been no reports. Based on the background above, it is necessary to conduct more in-depth research, so the author took a thesis with the title "Analysis of Uric Acid Levels in Pre-elderly Patients In Terms of Coffee Drinking Behavior in the Cikeusal Puskesmas Working Area, Serang Regency in 2022".

## II. MATERIALS AND METHODS

The design of this study is a quantitative analytical research with a cross-sectional design. The free variable in this study was coffee drinking behavior. The bound variable in this study was uric acid levels in pre-elderly patients. The research time will start in November-December of 2022. The place where the research was conducted at the Cikeusal Health Center, Serang Regency. The data were analyzed using univariate analysis of frequency distribution and bivariate analysis of one-way anova statistical test. The population used in this study was 312 pre-elderly patients who visited the Cikeusal Health Center, Serang Regency in

August-October 2022. The research sampling technique uses purposive sampling, where sampling is determined by the researcher with inclusion and exclusion criteria.

Measurements in this study used questionnaires. The data collection questionnaire was carried out using instruments in the form of questionnaires. The questionnaire used in this study used a closed questionnaire with structured questions asked directly to the subject, the subjects only had to choose the answers that were already available. The data that has been collected in this study is then processed using a computer program with several stages, namely recapitulating the results of the questionnaire answers filled out by respondents and then editing, coding, processing, and cleaning. The data were analyzed using Univariate analysis technique of frequency distribution and bivariate analysis technique of chi square statistical test to determine the effect of coffee drinking behavior on uric acid levels in pre-elderly patients in the Cikeusal Puskesmas Working Area, Serang Regency in 2022

## III. RESULT

An overview of the frequency distribution of uric acid levels in pre-elderly patients in the Cikeusal Puskesmas Working Area, Serang Regency in 2022 can be seen in the following table:

**Table 1.** Distribution of Uric Acid Levels Frequency in Pre-elderly Patients in the Cikeusal Puskesmas Working Area, Serang Regency in 2022

| Variable | Average | Std. Deviasi | Min | Max |
|---|---|---|---|---|
| Uric Acid Levels | 4,786 | 1,3797 | 2,9 | 7,9 |

Based on the results of the study in table 1, it is known that uric acid levels in pre-elderly patients in the Cikeusal Health Center Working Area, Serang Regency in 2022 averaged 4,786 with std. The deviation is 1.3797 minimum value 2.9 and maximum value 7.9.An overview of the distribution of the frequency of coffee drinking behavior in pre-elderly patients in the Cikeusal Puskesmas Working Area, Serang Regency in 2022 can be seen in the following table:

**Table 2.** Distribution of Frequency of Coffee Drinking Behavior in Pre-elderly Patients in the Cikeusal Puskesmas Working Area, Serang Regency in 2022

| Coffee Drinking Behavior | Frequency | Percentage (%) | Average | Std. Deviation | Min | Max |
|---|---|---|---|---|---|---|
| Low | 27 | 33,3 | 21,07 | 6,957 | 11 | 32 |
| Medium | 27 | 33,3 | | | | |
| High | 27 | 33,3 | | | | |

Based on the results of the study in table 2, it is known that coffee drinking behavior in pre-elderly patients in the Cikeusal Puskesmas Working Area, Serang Regency, in 2022, coffee drinking behavior is low, medium and high, each of 27 respondents (33.3%) with an average of 21.07 with std. The deviation is 6.957 minimum value 11 and maximum value 32. An overview of the effect of coffee drinking behavior on uric acid levels in pre-elderly patients in the Cikeusal Puskesmas Working Area, Serang Regency in 2022 can be seen in the following table:

**Table 3.** The Effect of Coffee Drinking Behavior on Uric Acid Levels in Pre-elderly Patients in the Cikeusal Puskesmas Working Area, Serang Regency in 2022

| Coffee Drinking Behavior | Uric Acid Levels | | | | | P Value |
|---|---|---|---|---|---|---|
| | f | Average | Std. Deviation | Min | Max | |
| Low | 27 | 5,381 | 1,5596 | 2,9 | 7,9 | 0,021 |
| Medium | 27 | 4,522 | 1,2176 | 2,9 | 6,6 | |
| High | 27 | 4,458 | 1,1784 | 3,1 | 6,2 | |

Based on table 3, it shows that the results of the Anova One Way test are known to have a significance value of 0.021 < 0.05, so it can be concluded that Ho was rejected and Ha was accepted, thus it can be concluded that there is an influence of coffee drinking behavior on uric acid levels in pre-elderly patients in the Cikeusal Puskesmas Working Area, Serang Regency in 2022.

## IV. DISCUSSION

### 1. Distribution of Uric Acid Level Frequency in Pre-elderly Patients in the Cikeusal Puskesmas Working Area, Serang Regency in 2022

Based on the results of the study, it can be seen that uric acid levels in pre-elderly patients in the Cikeusal Puskesmas Working Area, Serang Regency in 2022 averaged 4,786 with std. The deviation is 1.3797 minimum value 2.9 and maximum value 7.9.Reference value of uric acid for adult men: 3.5 – 7.2 mg/dl. Women: 2.6 – 6.0 mg/dl (normal range may vary slightly by laboratory) children: 2.0 – 5.5 mg/dl. Elderly 3.5 – 8.5 mg/dl. Hyperuricemia is the uric acid level of men >7mg/dl and women > 6 mg/dl (Angelina, 2019). According to Kuwabara (2019) factors that affect uric acid in the blood include diit high in purines, alcohol, age and sex, obesity, physical activity, impaired kidney function, certain drugs, foods containing Polyphenols. The Indonesian Rheumatology Association (2018) advocates for recommended lifestyle changes, while the recommended lifestyle changes are diet and physical exercise. In accordance with the results of Lelyana's research (2018), the average results of obesity uric acid levels at the beginning of the study were higher than the uric acid levels of obesity at the end of the study.

Rismawati (2021) obtained the results of uric acid levels in coffee drinking students 1-2 times a day and > 4 years old have normal uric acid levels of 94% with an average of 3.6 mg / dl. Sunita, et al (2019) found the results of uric acid levels of subjects who consumed coffee were lower than subjects who did not consume coffee. Researchers assume that based on these results, it can be known that the uric acid levels of pre-elderly patients are in the normal category. Because it is not more than >7mg/dl in men and > 6 mg/dl in women. Things that cause pre-elderly to have normal uric acid levels, one of which is by doing a high purine diit in accordance with the doctor's recommendations where previously had experienced high uric acid levels and recommended for a diet low in purines such as liver, emery, kidneys, offal, meat foods such as beef, lamb or mutton, and pork, seafood such as sardine, lobster, oysters, shellfish, shrimp, crab, skalop and alcohol-containing beverages or foods should also be limited, as well as fructose found in sweetened beverages. In addition, respondents regularly consume coffee. Based on the information obtained, it can be known that having a diet high in purines is one of the efforts to reduce uric acid levels.

### 2. Distribution of Frequency of Coffee Drinking Behavior in Pre-elderly Patients in the Cikeusal Pusk-esmas Work Area, Serang Regency in 2022

Based on the results of the study, it can be seen that coffee drinking behavior in pre-elderly patients in the Cikeusal Puskesmas Working Area, Serang Regency, in 2022, the behavior of drinking coffee is low, medium and high, each of 27 respondents (33.3%) with an average of 21.07 with std. The deviation is 6.957 minimum value 11 and maximum value 32.Coffee is famous for its high caffeine content. One cup of coffee equivalent to 120-480 ml can contain 100-200 mg or more of caffeine, depending on the type of coffee bean, how coffee is processed and preparing a coffee drink (Weinberg & Bonnie, 2018). Caffeine is a compound resulting from the secondary metabolism of the alkaloid group from the coffee plant and has a bitter taste. Various health effects of coffee are generally related to the activity of caffeine in the body (Muchtadi, 2019). A study shows that 100-200 mg of caffeine (1-2.5 cups of coffee) daily is the safe limit recommended by some doctors, however the amount differs by individual and experts agree that 600 mg of caffeine (4-7 cups of coffee) or more daily is too much because an overdose of caffeine is dangerous and can kill (FDA, 2019). The safe recommendation to drink coffee for healthy people is 2-3 cups pe day (Muchtadi, 2019). Nathania (2017) explained that the positive effects of caffeine in the body include being able to lose weight, improve sports performance, prevent decreased brain function, source anti-oxidants, and relieve stress.

The negative effects or risks of consuming too much caffeine according to Nanda (2019) include being harmful to the fetus, reducing fertility, anxiety, cardiovascular disorders, diarrhea, headaches, indigestion, increasing the risk of low back pain and breast pain and insomnia. In accordance with the results of Lelyana's research (2018), it was found that coffee drinking behavior was in the moderate category. . Coffee has activity as an antiobesity and has preventive measures against metabolic syndrome diseases. Khotimah, et al. (2018) found the results of most coffee drinking behaviors of 1-2 cups a day. Likewise, the results of Rismawati's research (2021) found the results of most of the behaviors of drinking coffee 1-2 glasses a day. Researchers assume that many respondents behave in the moderate category because they are based on an

overall average with a score of 21.07 where it is said to be moderate if the result score is 19-26. According to the results of the questionnaire, respondents often drink coffee every day where in a day 2 times and in a day drink coffee between 1-2 cups, and the average coffee drink between 3-4 years is done in the afternoon or evening on the grounds that the process of immunizing the coffee is during resting conditions. The type of coffee that is drunk is mixed coffee that has been circulating in the market, they do not include pure coffee on the grounds that it is rarely sold in the market and if they consume it, they like to make enek or nauseous so that most drink mixed coffee so as not to cause enek and palpitations. According to respondents, drinking coffee every day causes the body to be more excited, but sometimes it causes sleep disturbances that have an impact on headaches. Looking at the results of the questionnaire obtained that mimun coffee regularly is good for health, but must also pay attention to the time and amount of coffee drunk because it can have an impact on the body, including causing sleep disturbances because it is drunk at night, causing headaches.

**3. The Effect of Coffee Drinking Behavior on Uric Acid Levels in Pre-elderly Patients in the Cikeusal Puskesmas Working Area, Serang Regency in 2022**

The results of the Anova One Way test are known to have a significance value of 0.021 < 0.05, so it can be concluded that Ho was rejected and Ha was accepted, thus it can be concluded that there is an influence of coffee drinking behavior on uric acid levels in pre-elderly patients in the Cikeusal Puskesmas Working Area, Serang Regency in 2022.Everyone has uric acid in the body because in every normal metabolism uric acid is produced. Uric acid is a product of the metabolism of purines treated in the liver. Purines are derived from the results of protein overhauls. Normally, this uric acid will be excreted from the body through feces (feces) and urine (Smart, 2020). The perceived effects of someone who consumes caffeine regularly will be different from that of a person who only occasionally consumes (IFIC, 2019). Food intake high in purines is able to increase uric acid levels. The existence of benefits from coffee consumption against a decrease in uric acid levels will benefit coffee drinkers. There is a decrease in uric acid levels caused by the content of polyphenol compounds in coffee (Katzung & Trevor, 2020). The content of coffee (polyphenols) that has been identified as an antioxidant is chlorogenic acid (Welkriana, et al., 2018). In accordance with the results of research by Welkriana, et al.

(2018) The average uric acid level of men aged 45-65 years who have a habit of drinking light coffee is higher than the average uric acid level of men who have a habit of drinking heavy coffee and moderate coffee drinking habits. Based on statistical analysis, the results of the Anova One Way test were obtained, namely the p value (0.000) which is smaller than the α value (0.05), so it shows that there is a significant influence between coffee drinking habits on the uric acid levels of men aged 45-65 years. Sunita et al. (2019) there was a difference in uric acid levels between subjects who consumed coffee and did not consume coffee, uric acid levels of subjects who consumed coffee were lower than subjects who did not consume coffee (CI 95% 6.20, 7.80; p = 0.001). The uric acid levels of subjects who consumed coffee were lower than those subjects who did not consume coffee. Researchers assume the influence of drinking coffee with uric acid levels, this can be seen from the results where the more often you drink coffee, the lower the uric acid levels. This happens because coffee is a good source of antioxidants that function to help the body fight diseases, one of which is reducing excess uric acid levels. In addition, there is a decrease in uric acid levels caused by the content of polyphenol compounds in coffee, this polyphenol compound plays a role in inhibiting the work activity of the xanthine oxsidase enzyme competitively, thus playing a role in overcoming hyperuricemia conditions. Xanthine oxsidase is an enzyme that can catalyze hypoxanthine oxsidase into xanthine also on the oxidation of xanthine to uric acid.

## V. CONCLUSIONS AND SUGGESTIONS

Based on the results of the study, it is known that uric acid levels in pre-elderly patients in the Cikeusal Puskesmas Working Area, Serang Regency, in 2022 averaged 4,786. Coffee drinking behavior in pre-elderly patients in the Cikeusal Puskesmas Working Area, Serang Regency in 2022 is low, medium and high 33.3% with an average of 21.07, respectively. There is an influence of coffee drinking behavior on uric acid levels in pre-elderly patients in the Cikeusal Puskesmas Working Area, Serang Regency in 2022 with a p value = 0.021 < 0.005. It is expected to be an input or expected to be able to carry out regular checks and

maintain food intake that can affect uric acid levels and regulate drinking coffee regularly with an amount that is not too much between 1-2 times a day so that uric acid levels become normal and do not cause effects on other organs of the body because in addition to causing positive effects, jiga causes negative effects.

It is hoped that health workers can provide counseling to pre-elderly patients in an effort to overcome uric acid levels, one of which is by drinking coffee between 1-2 glasses a day regularly and doing a low-purine diet and exercise so that uric acid levels are maintained and the health degree of pre-elderly patients also increases. Researchers are further expected to conduct further research on various factors that cause elevated uric acid levels such as physical activity, menaupuse and alcohol consumption

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