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The Relationship Between Body Mass Index And Uric Acid Levels In Housewives In Sumber Gempol Dusun Rt 36 Rw 04 Pagelaran Village Pegalaran District, Malang Regency

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ABSTRACT

Introduction :*The sedentary lifestyle adopted by housewives causes obesity. Obesity can trigger gout due to an unbalanced diet. The normal body mass index is 18.5-24.9 kg/m2. Obesity can also increase uric acid levels, gout is inflammation of the joints. The aim of this study was to determine the relationship between body mass index and uric acid levels in housewives*
Objectives:*Gout sufferers, especially housewives, are expected to maintain their diet, to avoid foods that are fatty and have high purine levels.*
Methods:*. The method in this research uses a quantitative correlational research design using a cross-sectional approach. Respondents were 40 housewives using total sampling. The instruments in this study used the Easy Touch GCU uric acid test tool, weight scales, height measuring tools, and analysis of this data used the Spearman Rank Test.*
Results:*The results of data analysis obtained a p value = (0.005), namely that there is a relationship between body mass index and uric acid levels in housewives. Then the correlation value (r) is 0.436 which can indicate that there is a strong positive relationship between body mass index and uric acid levels.*
Conclusions:*Future researchers can accommodate research with other variables such as purine intake, heart or kidney disease, lack of drinking water, taking drugs that can play a role in intervening in the relationship between body mass index and blood uric acid levels.*

Introduction

Women tend to be obese which can cause increased uric acid and hyperuricemia. Generally found in women who work as housewives (Subandrate 2019). According to Ninawati (2018), the sedentary lifestyle adopted by housewives results in higher BMI (Body Mass Index) and obesity. Mansyur & Nurmala (2021) stated that 55.5% of housewives are at risk of experiencing high uric acid levels because they choose poor food and rarely exercise regularly.

Currently, the high concentration of uric acid in the blood is one of the main issues in public health. Uric acid is the result of the breakdown of purines which are usually excreted in the urine. Elevated uric acid levels in the body can cause painful joint inflammation, known as gout. This happens because uric acid crystals accumulate in the joints. The joints frequently affected are the toes, knees, heels, wrists, fingers and elbows. Apart from causing pain, uric acid can also cause swelling, inflammation, a hot sensation and stiffness in the joints, thus significantly interfering with daily activities.(Fajriansi & Yusnaeni, 2021).

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According to estimates from the World Health Organization (WHO), several hundred million people have experienced health problems related to joints and bones, such as rheumatism and gout. And these estimates show that the number of cases is likely to experience a significant increase by 2020. According to data from WHO 2015, the prevalence of gout has increased to 3.2% in the adult population in the UK and 3.9% in the United States. In Korea, the gout prevalence rate has also increased from 3.49 per 1000 people in 2007 to 7.58 per 1000 people in 2015. WHO data from 2017 shows that the global prevalence of gouty arthritis is 34.2%. Based on the 2018 WHO results, there was an increase of 1,370 cases (33.3%). Based on the 2013 WHO survey, Indonesia was ranked fourth as the country with the largest population in the world that experiences gout problems. The prevalence of gout in Indonesia among individuals under 34 years of age reaches 32%. A study conducted in Bandungan, Central Java, showed that of the 4,683 respondents included in the survey, 0.8% of them experienced high uric acid levels in the 15-45 year age group. The prevalence of high uric acid is higher in men, namely 1.7%, while in women it is only 0.05%. Some of the participants even reached more severe levels of gout problems. (Fajriansi and Yusnaeni, 2021). Based on 2018 Riskesdas data, the incidence of gout in Indonesia diagnosed by professional health workers is 11.9% among individuals over the age of 75 years, with the highest prevalence of 54.8% in Aceh and 6.72% in East Java among the population aged above 15 years. The prevalence of gout is higher in women (8.46%) compared to men (6.13%) (Indonesian Ministry of Health, 2018).

The level of uric acid in the body mainly depends on the balance between production and excretion. Uric acid production is influenced by diet and the body's internal processes, including biosynthesis, degradation, and formation of uric acid stores. through the rescue process. The recommended reference value for uric acid levels in adult men ranges from 3-7 mg/dL, while in women it ranges from 2.4-6 mg/dL. If the blood uric acid level exceeds this reference value, it is considered high. Risk factors that contribute to hyperuricemia include age, excessive consumption of purine compounds, excessive alcohol intake, overweight (obesity), and lack of physical activity.(Hidayah, 2017).

In preliminary research conducted through interviews with 10 housewives on February 20 2023, in Sumbergempol Hamlet, RT 36 RW 04, Pagelaran Village, it was found that 6 of them were more likely to be overweight or obese, with a Body Mass Index (BMI) ranged from 25.2 to 30.2, classified as grade 1 obesity. On the other hand, 4 of them had normal weight or less with BMI ranging from 20.8 to 22.6. Of the 10 housewives, 6 reported experiencing joint pain and feeling hot at night. This observation was further confirmed by uric acid tests performed on 10 individuals. The results of the study showed that 4 of them had uric acid levels in 6 individuals in the normal category, namely between 2.4 to 6.0 mg/dL, while the other 6 individuals had uric acid levels above the normal category, namely more than 6.0 mg/dL.

To manage obesity or excess BMI (Body Mass Index), it is recommended to consume green leafy vegetables such as spinach, kale, broccoli, cucumber and lettuce in the diet. However, be careful if you consume too much spinach and kale because it can cause an increase in uric acid levels in the body. Fruits that are suitable for individuals with excessive BMI are apples, watermelon, tomatoes and strawberries. To deal with high

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uric acid levels, a person can start by adopting a healthy lifestyle, which involves avoiding purine-rich foods such as brain, liver, heart, organ meats, meat extracts, red meat, duck, sardines, anchovies, mussels, mussels, crab. , durian, and avocado. To manage acute gout attacks, individuals can take certain medications prescribed by a doctor, including nonsteroidal anti-inflammatory drugs (NSAIDs), colchicine, corticosteroids, probenecid, sulfinpyrazone, and allopurinol(KEMKES, 2022).

This study aims to identify the relationship between Body Mass Index (BMI) and AS levelscommon with housewives. in Sumber Gempol Hamlet RT 36 RW 04 Pagelaran Village.

Methods

This research was designed to analyze the correlation between the relationship between uric acid levels and body mass index in housewives in Sumbergempol Hamlet RT 36 RW 04 Pagelaran Village, Pagelaran District, Malang Regency. This research uses a cross-sectional approach. The population referred to in this study was 40 women aged 25-35 years in Sumbergempol Hamlet RT 36 RW 04 Pagelaran Village, Malang Regency District. The sampling technique used in this research was total sampling, namely the total population of 40 women aged 25-35 years in Sumbergempol Hamlet RT 36 RW 04 Pagelaran Village, Pagelaran District, Malang Regency. This research uses instruments including weight scales, height measuring tools, and the uric acid examination tool used in this research is the Easy Touch GCU tool. The bivariate analysis in this study is non-parameteric, namely the correlation coefficient with the Spearman test.

Results

Table 1 Frequency Distribution Based on Respondent's Age

Age	Frequency	Percentage (%)
25-30 years	17	42.5
31-35 years old	23	57.5
Total	40	100

Based on the results listed in the table above, it can be seen that respondents aged 31-35 years were (57.5%).

Table 2 Distribution of Respondents' Body Mass Index Category Results

Category	Frequency	Percentage (%)
Thin	3	7.5
Normal	16	40
Overweight	21	52.5
Total	40	100

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Based on the results obtained in table 5.3, it can be seen that 21 people (52.5%) have an overweight body mass index.

Table 3 Distribution of Body Mass Index Based on Respondents' Age

Body mass index	Age					
	25-30 years		31-35 years old		Total	
	f	%	f	%	f	%
Thin	1	2.5	2	5	3	100
Normal	7	17.5	9	22.5	16	100
Overweight	9	22.5	12	30	21	100

Based on the table, it is known that 9 people (22.5%) aged 25-30 years and 12 (30%) aged 31-35 years respondents had an overweight body mass index.

Table 4 Distribution of Respondents' Uric Acid Level Categories

Category	Frequency	Percentage (%)
Normal	17	42.5
Tall	23	57.5
Total	40	100

Based on the results obtained in table 5.4, it can be seen that 23 people (57.5%) had high uric acid levels.

Table 5 Distribution of Uric Acid Levels Based on Respondents' Age

Uric Acid Levels	Age					
	25-30 years		31-35 years old		Total	
	f	%	f	%	f	%
Normal	8	20	9	22.5	17	100
Tall	9	22.5	14	35	23	100

Based on table 6, it is known that 9 respondents (22.5%) aged 25-30 years and 14 people (35%) aged 30-35 years had high uric acid levels.

Table 6 Cross Tabulation of the Relationship Between Body Mass Index and Uric Acid Levels in Housewives in Sumber Gempol Hamlet RT 36 RW 04 Pagelaran Village, Pagelaran District, Malang Regency

Body mass index	Uric Acid Levels

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	Normal		Tall		Total	
	f	%	f	%	f	%
Thin	1	2.5	2	5	3	100
Normal	12	30	4	10	16	100
Overweight	4	10	17	42.5	21	100

Based on the results obtained in table 6, namely the results of cross tabulation, it is known that 21 people (52.5%) with a body mass index were overweight with high uric acid levels. Table 7 Analysis of Relationships between Variables

Analysis of Relationships Between Variables	*P*	*r*	N
Body Mass Index with Uric Acid Levels in Housewives in Sumber Gempol Hamlet RT 36 RW 04 Pagelaran Village, Pagelaran District, Malang Regency	0.005	0.436	40

Based on the results obtained in table 7, it can be seen that the results of the analysis of the Spearman rho test are that the value p = (0.005) so that the hypothesis decision Ha is accepted and Ho is rejected, namely that there is a relationship between body mass index and uric acid levels in housewives in Hamlet. Sumber Gempol RT 36 RW 04 Pagelaran Village, Pagelaran District, Malang Regency. Then the correlation value (r) is 0.436 which can indicate that there is a strong positive relationship between body mass index and uric acid levels, according to which the correlation value between 0.41 to 0.70 means that there is a strong relationship.(Sujarweni, 2015). Based on the results obtained, body mass index can cause high uric acid levels. This also shows that the hypothesis obtained is one-way, namely the positive direction or the negative direction(Stang, 2018). This means that the higher the body mass index, the higher the uric acid levels in housewives in Sumber Gempol Hamlet RT 36 RW 04 Pagelaran Village, Pagelaran District, Malang Regency.

Discussion

Body Mass Index of Housewives in Sumber Gempol Hamlet RT 36 RW 04 Pagelaran Village, Pagelaran District, Malang Regency

This research produced data showing that of the respondents involved, there were 3 people (7.5%) with a thin body mass index, 16 people (40%) with a normal body mass index, and 21 people (52.5%) with an overweight body mass index.

The problem of obesity has become a widespread health problem globally and in Indonesia(Harbuwono et al., 2018). However, the findings of this study conflict with reports indicating that the majority of overweight and obese individuals are

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women(Global Nutrition Report, 2018). According to data from Riskesdas (2018), the highest prevalence of obesity based on age group is experienced by women (46.7%) and men (15.7%). Regarding work, housewives have the highest prevalence of obesity, accounting for 36.3% based on Riskesdas data (2007).

As a housewife, engaging in various tasks and activities may consume little energy, leading to an imbalance between energy expenditure and energy intake. According toKhoriyatun Ninawati, (2018)The sedentary lifestyle adopted by housewives contributes to being overweight, because their household work tends to be monotonous. Lack of physical activity results in fewer calories expended. According to Patonah (2021) in(Febi Kusuma Nugraha & Sulastri, 2016)also noted that pregnant housewives who gain excessive weight can face various health problems, such as hypertension, which can ultimately lead to pregnancy-induced preeclampsia.

Based on research findings, supported by existing theories and facts, the researcher's opinion or opinion is that the majority of respondents are in the adult age group, especially between 31-35 years, as shown by the characteristic age distribution. Adults in this age range are more aware of the importance of maintaining a healthy lifestyle to prevent being overweight or obese, which can lead to other health problems. The assumption is that there are very few respondents who are classified as underweight because most of them exhibit unhealthy lifestyles that tend to lead to being overweight.

Uric Acid Levels in Housewives in Sumber Gempol Hamlet RT 36 RW 04 Pagelaran Village, Pagelaran District, Malang Regency

The research results produced data showing that 17 respondents (42.5%) had normal uric acid levels, while 23 respondents (57.5%) had high uric acid levels.

When uric acid levels in the blood are too high, it can be an indication of a condition called Hyperuricemia, where there is excess uric acid in the blood. Hyperuricemia itself may not immediately cause gout, but if it persists, it may eventually lead to gout. Gout is a type of arthritis that involves inflammation of the joints, resulting in pain, heat, swelling, and stiffness in the affected joints. This condition is caused by excess uric acid in the blood, which causes a buildup of uric acid crystals in the joints and other soft tissues(Sari & Syamsiyah, 2022)

According to Walker and Thompson's theory, as quoted in Cahyanti (2021), housewives are married women who do not work and spend most of their time taking care of household work. They definitely face the same environment and routine tasks every day. The monotonous activities of housewives result in limited physical activity which can slow down acid metabolism(Welkriana et al., 2022). Uric acid is a byproduct of purine metabolism, and normal uric acid levels in women range from 2.4 to 5.7 mg/dL.Mansyur & Nurmala (2021)reported that 55.5% of housewives are at risk of having high uric acid levels due to poor food choices and lack of regular exercise.

Based on the opinion of researchers, supported by research findings and the theories mentioned above, the high incidence of gout among respondents is caused by the lack of heavy physical activity carried out by housewives, which slows down their

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metabolism. In addition, high intake of purines and foods rich in fructose contribute to increased uric acid production. Internal processes of uric acid biosynthesis, degradation, and salvage also play a role in elevated uric acid levels, along with obesity.

The Relationship Between Body Mass Index and Uric Acid Levels in Housewives in Sumber Gempol Hamlet RT 36 RW 04 Pagelaran Village, Pagelaran District, Malang Regency

Based on the results of the analysis, it was revealed that the Spearman's rho test produced a p-value of (0.005), which leads to acceptance of the alternative hypothesis (Ha) and rejection of the null hypothesis (Ho), indicating a significant relationship between body mass index (BMI) and uric acid levels. to Housewives from Sumber Gempol Hamlet RT 36 RW 04, Pagelaran Village, Pagelaran District, Malang Regency. Furthermore, the correlation coefficient (r) was found to be 0.436, indicating a strong positive relationship between BMI and uric acid levels. According to the correlation value, which is between 0.41 and 0.70, this indicates a strong association(Sofiyetti et al., 2023). The results obtained show that body mass index can influence uric acid levels, showing that a higher BMI is associated with increased uric acid levels in housewives from Sumber Gempol Hamlet RT 36 RW 04, Pagelaran Village, Pagelaran District, Malang Regency. This means that when body mass index increases, uric acid levels also tend to increase in housewives.

This is in accordance with the results of research by Purnamaratri (2018), which shows that obesity is one of the factors that influences uric acid levels. Elevated uric acid levels may be associated with increased production, excessive consumption of purines, and decreased excretion rate by the kidneys; Obese people experience increased uric acid production and a decreased rate of excretion by the kidneys. Therefore, obesity greatly affects uric acid levels, and BMI is one of the causes of uric acid imbalance.

According to Jumiyati & Witradharma, (2020), several factors can influence the increase in uric acid levels in housewives, including a sedentary lifestyle, consumption of high purine foods, and obesity, which can cause an increase in blood uric acid levels.(Leokuna & Malinti, 2020). Unhealthy eating habits and lack of physical activity among housewives contribute to the increasing prevalence of obesity and overweight conditions(Oddo et al., 2019). In women (housewives), an increase in uric acid levels usually occurs after menopause. This is because women have the hormone estrogen which helps in the excretion of uric acid from the body(Leokuna & Malinti, 2020). This is believed to be due to increased leptin levels in obese women. Leptin regulates the concentration of uric acid in the blood, so increased leptin levels can cause hyperuricemia(Sari et al., 2019).

Based on the opinions of researchers and the results of the research and theories above, it is assumed that the correlation between Body Mass Index (BMI) and uric acid levels may arise due to factors such as insulin resistance which have the potential to influence the body's ability to dispose of uric acid. Lack of physical activity and increased

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caloric intake lead to obesity, which results in increased concentrations of free fatty acids in the blood, decreased insulin sensitivity, and increased insulin resistance.

Conclusion

1. Uric acid levels in housewives in Sumber Gempol Hamlet RT 36 RW 04 Pagelaran Village, Pagelaran District, Malang Regency on average have high uric acid levels, namely above 6.00mg/dL
2. The body mass index of housewives in Sumber Gempol Hamlet, RT 36 RW 04, Pagelaran Village, Pagelaran District, Malang Regency, on average has an overweight body mass index category.
3. There is a relationship between body mass index and uric acid levels in housewives in Sumber Gempol Hamlet RT 36 RW 04 Pagelaran Village, Pagelaran District, Malang Regency

Ethics approval and consent to participate

Based on the letter passing the ethical review from the Health Research Ethics Commission of the Health Polytechnic, Ministry of Health, Malang with number No. 717/VII/KEPK POLKESMA/2023, it was declared ethically appropriate according to 7 (seven) WHO 2011 Standards, namely 1) Social Value, 2) Scientific Value, 3) Equalization of Burden and Benefits, 4) Risk, 5) Inducement/Exploitation, 6) Confidentiality and Privacy, and 7) Consent After Explanation, which refers to the 2016 CIOMS Guidelines.

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