DESCRIPTION OF THE RESULTS OF URIC ACID EXAMINATION IN OBESITE STUDENTS AT THE BINA MANDIRI UNIVERSITY GORONTALO CAMPUS

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ABSTRACT

Obesity is associated with increased uric acid levels because kidney excretion tends to be low. Obesity can occur at all ages, both children and the elderly. The aim of the research was to determine the results of uric acid examination in obese students at the Bina Mandiri University Gorontalo Campus. Based on the sample studied, why should we use a student sample because the respondents who will be sampled are students on the Bina Mandiri University Gorontalo campus. The method in this research uses descriptive research with a cross sectional design and a quantitative approach. The type of data used is primary data in the form of data obtained or collected directly in the field by researchers from the respondents concerned. The sampling technique uses purposive sampling technique, with a sample size of 10 samples. The results of the research were that there were 6 samples (60%) that were abnormal and 4 samples (40%) that were normal. Based on the results of the research that has been carried out, it can be concluded that there are 6 samples (60%) that are abnormal and 4 samples (40%) that are normal, then the lowest uric acid level in obese students is 3.7 mg/dl and the highest level is 3.7 mg/dl. 7.8 mg/dl, with an average value of 6.1 mg/dl.

Keywords: Uric Acid, Obesity, Students

INTRODUCTION

Uric acid is the final product of purine catabolism which is synthesized in the liver and excreted through the urinary tract. Increased uric acid levels in the blood can cause several diseases such as hyperuricemia and kidney disease. (Soputra and et al, 2018). According to 2018 World Health Organization (WHO) data, the prevalence of gouty arthritis in the world is 34.2%. Basic Health Research (2018) states that based on doctors' diagnoses, the prevalence of gouty arthritis in Indonesia is 7.3%. This prevalence is included in the high category and can be a health problem (WHO, 2018).

Obesity is associated with increased uric acid levels because renal excretion tends to be low. Obesity sufferers cause hyperuricemia through increased uric acid production and decreased renal clearance which causes a decrease in urate excretion by the kidneys with insulin resistance (Ruiz - Hurtado & Ruilope 2014).

Based on the sample studied, why should we use a student sample because the respondents who will be sampled are students on the Bina Mandiri University Gorontalo campus.

The prevalence of gout arthritis in Indonesia is increasing. In 2018, the

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incidence of gout arthritis was 11.9% (Ministry of Health of the Republic of Indonesia, 2018). An increase in uric acid levels that exceed normal levels is called hyperuricemia. Research data shows that hyperuricemia is more common in people who are overweight and have high blood cholesterol levels compared to people who do not have this disease. (Widarti and et al, 2018).

Based on the results of the Indonesian Basic Health Research (Riskesdas) in 2018, the prevalence of obesity was 10.5% in 2007, 14.8% in 2013 and 21.8% in 2018. Meanwhile, the prevalence of gout based on the diagnosis of health workers in Indonesia in 2017 was 11.9% and based on diagnosis or symptoms 24.7%. The prevalence based on health workers' diagnosis was highest in Bali at 19.3%, followed by Aceh 18.3%, West Java 17.5% and Papua 15.4%. Meanwhile, the prevalence of obesity in South Sumatra in 2017 reached 18.0%, consisting of 13.5% very obese and 4.5% obese. Musirawas health profile data in 2017 states that the 10 biggest diseases, one of which is arthritis with a total of 28,987 cases (Riskesdas, 2018).

According to the World Health Organization (WHO), obesity cases have tripled throughout the world from 1975 to 2016 (Ramadhani & Sulistyorini, 2018). And according to WHO data (2017) the prevalence of gouty arthritis in the world is 34.2%. Basic Health Research (2018) states that based on doctors' diagnoses, the prevalence of gouty arthritis in Indonesia is 7.3%. This prevalence is included in the high category and can be a health problem (Riskesdas, 2018).

In Indonesia, the number of obesity cases continues to increase every year. According to Riskesdas data in 2010, the national obesity rate was 2.5% in those aged 13-15 years, 1.4% in adolescents aged 16-18 years and experienced an increase in 2018. From Riskesdas data in 2013, it increased by 7.3 % in adolescents aged 16-18 years (Ministry of Health, 2013). Data from the health profile of East Java province for 2015-2016 states that there was an increase in 2015 from 192,726 to 315,512 (Ministry of Health, 2018). The results of Riskesdas (2013) sequentially for 2007, 2010, and 2013 show that the number of obese sufferers in Gorontalo Province has increased successively in 2007 above 10%, in 2010 above 30%, and in 2013 above 40%. in men and women (Riskesdas, 2018).

Data obtained from the Gorontalo City Health Service in 2023 from January to May shows that the incidence of obesity was 5,661 cases. Based on this, it is important to carry out research on the Description of Uric Acid Examination Results in Obesity (Gorontalo City Health Office, 2023).

Data obtained from the Gorontalo District Health Service in 2018 showed that the incidence of obesity was 8,795 cases (30.9%). Based on this, it is important to carry out research on factors related to the incidence of obesity. (Gorontalo District Health Office, 2018).

Based on the results of the Indonesian Basic Health Research (Riskesdas) in 2018, the prevalence of obesity was 10.5% in 2007, 14.8% in 2013 and 21.8% in 2018. Meanwhile, the prevalence of gout based on the diagnosis of health workers in Indonesia in 2017 was 11.9% and based on diagnosis or symptoms 24.7%. The prevalence based on health workers' diagnosis was highest in Bali at 19.3%, followed by Aceh 18.3%, West Java 17.5% and Papua 15.4%. Meanwhile, the prevalence of obesity in South Sumatra in 2017 reached 18.0%, consisting of 13.5% very obese and 4.5% obese. Musirawas health profile data in 2017 states that the 10 biggest diseases, one of

which is arthritis with a total of 28,987 cases (Riskesdas, 2018).

From previous research conducted by Ran, Ongkowijaya and Kawengian in October-November 2015 regarding the comparison of uric acid levels in obese and non-obese subjects at the Faculty of Medicine, Sam Ratulangi University, Manado, the results showed that the average uric acid levels in the obese group were significantly higher. than the non-obese group (Rau, Ongkowijaya and Kawengian, 2019).

Based on the background above, researchers are interested in researching "The description of the results of uric acid examinations in obese students at the Bina Mandiri University Gorontalo Campus".

RESEARCH METHODS

The method in this research uses descriptive research with a cross sectional design and a quantitative approach. The type of data used is primary data in the form of data obtained or collected directly in the field by researchers from the respondents concerned. The sampling technique uses purposive sampling technique, with a sample size of 10 samples.

1. Pre Analytics

   The pre-analytics in this study include patient preparation, examination methods with the Mindray BS-380 Kimi Analyzer, tools and materials used (dispo, tourniquet, tube rack, red vacuum tube, centrifuge, micropipette, tip, serum, alcohol cotton, handscoon, and tissue)
2. Analytic
   a. Turn on the tool that will be used to check uric acid
   b. Prepare the tools and materials to be used
   c. Prepare the serum/plasma in a sample cup and name the patient
   d. Check the reagent in the tool with the ratio specified on the reagent bottle.
   e. Then click "sample request" then type the patient ID, sample number and patient name in the columns provided
   f. Then click the (UA) uric acid icon
   g. Then click OK
3. Post Analytics

   According to WHO (2019), the reference values for uric acid examination are as follows:

   Women: 2.4 – 6.0 mg/dL

   Men: 3.4 –7.0 mg/dL

RESEARCH RESULT

Based on the results of research carried out for 2 (two) days at the Toto Kabila Regional General Hospital, Kab. Bone Bolango on 21-22 October 2023, using 10 samples of obese student serum, the following results were obtained:

Table 4.1. Results of research examining uric acid levels in obese students.

spondent characteristics	Criteria	Uric Acid Levels			Frequency
		ormal	Abnormal		
			Low	all	
Gender	Man	2	0	1	3
	Woman	2	0	5	7
	Total	**4**	**0**	**6**	**10**
Age	19 years old	0	0	1	1
	20 years	2	0	1	3
	21 years	2	0	4	6
	Total	**4**	**0**	**6**	**10**
Obesity Category	FatLight	1	0	0	1
	Heavy Fat	3	0	6	9
	Total	**4**	**0**	**6**	**10**

(Source: Primary Research Data, 2023).

Table 4.1 above shows that there are 3 (three) characteristics of the respondents studied in this study, first namely gender, age and then obesity category. Then the uric acid level is the independent variable in the research. Regarding gender characteristics, information was obtained that of the 10 respondents in this study, the majority were female, namely 7 people (70%), while 3

Uric Acid Levels	Frequency	Percentage (%)
Normal	4	40.0
Abnormal	6	60.0
Amount	**10**	**100**

people were male (30%). Of the 7 women, there were 2 people whose uric acid levels were normal and 5 people whose uric acid levels were abnormal (high). Meanwhile in men, of the 3 people studied, there were 2 people whose uric acid levels were normal and 1 person had increased (high).

For age characteristics, according to table 4.2. above, that of the 10 respondents studied, the majority were 21 years old, namely 6 people (60%), 3 people aged 20 years (30%), while only 1 person aged 19 years (10%). In the 19 year age category, the uric acid levels obtained were normal, then at the age of 20 years there were 2 people whose uric acid levels were normal and 1 person who was abnormal (high). Meanwhile, in the 21 year category, there were 2 people whose uric acid levels were normal and 4 people whose uric acid levels were abnormal (high).

In the obesity category, based on body mass index (BMI), which is measured based on the results of calculations between body weight in kilograms (kg) and height in meters (m2). Based on the results of the BMI measurements, a picture of obesity was obtained in 2 (two) categories, namely 1 person (10%) who was mildly obese and 9 people (90%) who were severely obese. For the criteria for light obesity, respondents (1 sample) showed normal uric acid levels, while for the criteria for severe obesity, there were 3 samples (30%) whose uric acid levels were normal and 6 samples (60%) whose uric acid levels were high (abnormal). The percentage of abnormal values for respondents' uric acid levels according to the data analysis in this research is:

Table 4.2 Percentage of Respondents' Uric Acid Levels
(Source: Primary Research Data, 2023).

Table 4.2 above shows the results of checking uric acid levels in the 10 respondents studied. From these results, it can be seen that there were 6 samples or a percentage of 60% whose uric acid levels were abnormal, while 4 samples (40%) had normal uric acid results. A description of respondents' uric acid levels along with the average value of uric acid levels in the study can be shown in the following table:

Table 4.3. Description of Respondent's Uric Acid Level

No	Sample Code	Uric Acid (AU) Measurement	
		AU level (mg/dl)	Results Category
1	A	7.8	Abnormal
2	B	5.0	Normal
3	C	3.7	Normal
4	D	5.2	Normal
5	E	6.3	Abnormal
6	F	6.2	Normal
7	G	6.5	Abnormal
8	H	6,8	Abnormal
9	I	6,7	Abnormal
10	J	6.4	Abnormal
	Total	**60.6**	
	Average	**6.1**	

(Source: Primary Research Data, 2023).

Table 4.3 above describes the results of checking uric acid levels in the 10 respondents studied. From these results, it can be seen that the lowest uric acid level was 3.7 mg/dl (sample code C) and the

highest level was 7.8 mg/dl (sample code A), with a mean value of 6.1 mg/dl etc.

DISCUSSION

This research was conducted in the region by taking research subjects, namely students at the Bina Mandiri University Gorontalo Campus who were obese.obesity. Measurement of uric acid levels or sample examination was carried out at Toto Kabila Regional Hospital for 2 (two) days using purposive sampling as a sample collection technique. The research process began on 21-22 October 2023 with a sample of 10 obese students. Before taking blood, the body mass index (BMI) is determined first, which is obtained from measuring body weight in kilograms (kg) and height in meters (m2), while the overall results are shown in table 4.1 – 5.4 above.

1. Uric Acid Levels in Obese Students Based on Gender

   In accordance with the research results shown in table 4.1, data was obtained that of the 10 respondents studied in this study, the majority were female, namely 7 people (70%), while 3 people were male (30%). Based on these results, it can be concluded that obesity is more common in women than men.

   These results are in line with obesity data in Indonesia as shown in the 2018 Riskesdas results which show the ratio of obesity between women and men, namely 15.11% : 12.1%. Qoirinasari (2018), states that women are at risk of obesity due to hormonal factors and daily activities in women which are relatively low and the percentage of body fat in women is higher. The influence of hormones on a woman's body is not limited to the menstrual cycle, it is this hormonal influence that makes women experience an increased risk of obesity. Apart from that, Ujii (2018), added that the occurrence of excess weight which leads to obesity in women is mainly caused by age and lifestyle factors, which lead to habits of eating patterns high in calories, fat and cholesterol which are not balanced with activity. physical problems will cause more nutritional problems. Where the habit of consuming energy-dense foods results in greater intake because adults tend to respond to food volume rather than energy.

   This result is also in line with the results of research by Nugroho (2020), which found that the majority of respondents were women, namely 5,488 people (55.9%), while there were 4,321 men (44.1%).

2. Uric Acid Levels in Obese Students Based on Age

   Regarding age characteristics, according to the research results shown in table 4.1, data was obtained that of the 10 respondents studied in this study, the majority were 21 years old, namely 6 people (60%), 3 people aged 20 years (30%). , while only 1 person aged 19 years (10%). From this table, it can be seen that respondents aged 19 years had normal uric acid levels, then at the age of 20 years there were 2 people whose uric acid levels were normal and 1 person who was abnormal (high). Meanwhile, in the 21 year category, there were 2 people whose uric acid levels were normal and 4 people whose uric acid levels were abnormal (high). Based on these results, it can be concluded that as age increases, the risk of obesity will also increase, however, at a relatively young age, respondents consisting of students are already suffering from obesity.

   This is in line with Ujii's statement (2018), that as you get older you are at risk of obesity, due to excessive fat accumulation in the body, which is supported by changes in your diet from

high carbohydrates, high fiber and low fat to a new diet. which is low in carbohydrates, low in fiber and high in fat, thereby shifting the quality of food towards an unbalanced one.

Apart from that, Fernando's statement (2019) also supports the results of this research, that the younger age group is at risk of obesity because they still don't pay attention to their body appearance. This happens naturally, the older a person is, the more they will try to maintain their body image to be attractive. the opposite sex. According to the psychology dictionary, body image is a person's idea of his appearance in front of (to) other people. Body image is a description and evaluation of a person's appearance. Body image is a person's belief in their appearance in front of other people. Due to this body image, teenagers who are older will try to maintain their appearance compared to teenagers who are younger.

In addition, Weni et al. (2019), also added that the problem of obesity in teenagers will affect obesity in adulthood, because if obesity occurs in teenagers it will be difficult to reduce obesity in the adult phase. There needs to be prevention efforts carried out by all parties, including the central government, regional governments and the private sector, through Corporate Social Responsibility (CSR) as a form of social responsibility to society. Intervention on obesity problems can be achieved through health promotion, limiting space for foods and drinks that cause obesity, maximizing the function of public facilities such as sports parks and others as well as policies regarding support for public facilities for physical activity. Self-awareness must also be raised in teenagers so that teenagers can work on their health independently without being dependent on other people.

These results are in line with the results of research by Makmun and Risdayani (2021), with results obtained from 80 respondents, 8 people aged under 18 years (< 18 years), and those aged over 18 years (> 18 years) as many as 72 people (63.7%).

3. Characteristics of Student Obesity

Ganong (2018), states that obesity is an increase in total body fat, namely if excess weight is found > 20% in men and 25% in women due to fat. Obesity can also be interpreted as a condition where the ratio of body weight and height exceeds specified standards.

In this study, determining obesity standards is based on the results of determining body mass index (BMI) based on the results of measuring body weight in kilograms (kg) and height in meters (m2), after obtaining data on body weight and height, then BMI is measured by formula: BMI = Body Weight (kg) / Body Height (m2), the results of determining BMI are then classified into the obesity category on the National scale, namely mild obesity or severe obesity. These results are shown in table 4.1.

Based on this table, information was obtained that 1 person (10%) was mildly obese and 9 people (90%) were severely obese. Thus it can be said that all respondents in this study were obese.

According to researchers, the occurrence of obesity in young students, namely between 19 years and 21 years, cannot be separated from unhealthy habits and lifestyles, including eating patterns, rarely exercising and stress in students. This is in line with the theory stated by the Ministry of Health (2018), that there are several factors that cause

obesity, namely: unhealthy eating patterns, lack of exercise activity and stress levels.

According to the Ministry of Health (2018), the consequences of unhealthy eating patterns are also influenced by food choices and eating habits, such as: lack of fruit and vegetable consumption, eating excessive fatty foods, drinking sweet or high-calorie drinks, often skipping breakfast, excessive portion sizes. , and consuming fast food too often, especially among young people such as students.

Apart from unhealthy eating patterns, rarely moving and exercising can be the cause of a spike in obesity cases, this happens because students rarely move due to busy academic activities, compared to unhealthy eating patterns, this may happen because the number of calories eaten is not completely burned.

Likewise with stressful conditions, which can cause obesity indirectly without realizing it. When stressed, people may find it more difficult to eat healthy. Eating due to stress is likely to be dominated by high-calorie foods, even when you don't feel hungry. If this habit is continued without being accompanied by physical activity, it can certainly trigger weight gain which can end in obesity (Ministry of Health, 2018).

4. Results of examination of uric acid levels in obese students

In accordance with the research results shown in table 4.1. and 4.2 above regarding the results of measuring uric acid levels in 10 obese students who were used as respondents, showed that there were 6 samples (60%) whose uric acid levels were abnormal, and normal results were 4 samples (40%). According to table 4.1. above shows that students who are mildly obese show normal uric acid levels, while there are 9 students who are severely obese, 3 samples (30%) whose uric acid levels are normal and 6 samples (60%) whose uric acid levels are normal. The uric acid levels are high (abnormal), in other words the majority of students who are severely obese have abnormal (increased) uric acid levels. From these results it can be concluded that the obesity category also influences uric acid levels, or in other words, obesity is related to uric acid levels.

According to researchers, the results of normal uric acid levels in individuals who are mildly obese are not solely caused by unhealthy food consumption or eating patterns, but rather lead to genetic factors. This is in accordance with the statement of Kuo et al. (2019), that genetic factors greatly contribute to the etiology of gout (a disease caused by excessive levels of uric acid in the blood) and are relatively sexually dimorphic (Kuo et al., 2019). The risk of hyperuricemia (increased uric acid levels) is higher in people with a family history of hyperuricemia with an OR value of 4.053, obtained p = 0.003, which means that hereditary history is associated with hyperuricemia (Artini & Yanti, 2019). Additionally, research by Park et al. (2019), also stated that not all teenagers who are overweight experience increased uric acid levels. Lack of physical activity such as having a sedentary lifestyle for more than 10 days tends to increase uric acid levels.

Meanwhile, individuals who experienc e hyperuricemia (increased/abnormal uric acid levels) are more likely to do so due to unhealthy eating habits, rarely engaging in sports and high levels of stress in living life as a student. This is in accordance with the statement from the Ministry of Health (2018) which explains

that unhealthy eating patterns can be a factor causing obesity. This is because the amount of calorie intake to the body has a direct impact on body weight. Consuming more calories than the body burns can certainly trigger weight gain.

The consequences of unhealthy eating patterns are also influenced by food choices and eating habits, such as: lack of fruit and vegetable consumption, eating excessively fatty foods, drinking sweet or high-calorie drinks, often skipping breakfast, excessive portion sizes, and consuming fast food. too often which is especially done by young people such as students. Apart from unhealthy eating patterns, lack of movement and exercise can be the cause of the spike in obesity cases in many countries. The increased risk of obesity is more influenced by not moving enough than unhealthy eating patterns, this may occur because the number of calories eaten is not completely burned. As a result, the remaining calories turn into fat and accumulate in the stomach, triggering weight gain. Therefore, obesity can only be overcome if you do both, namely a healthy diet coupled with regular exercise (Ministry of Health, 2018).

Likewise with stressful conditions, which can cause obesity indirectly without realizing it. When stressed, people may find it more difficult to eat healthy. Some people, when they feel very stressed, allow themselves to fulfill their emotional needs by eating. Eating due to stress is likely to be dominated by high-calorie foods, even when you don't feel hungry. If this habit is continued without being accompanied by physical activity, it can certainly trigger weight gain which can end in obesity (Ministry of Health, 2018).

According to Musabiq and Karimah (2018), there are several conditions that cause stress in students, that in the student context, there are four sources of stress in students, namely interpersonal, intrapersonal, academic, and environmental. Interpersonal is a stressor that results from relationships with other people, for example conflicts with friends, parents, or girlfriends. Intrapersonal is a stressor that originates from within the individual himself, for example financial difficulties, changes in eating or sleeping habits, and declining health. Academics are stressors related to lecture activities and the problems that follow, for example bad test scores, lots of assignments, and difficult subject matter. Environment is a stressor that comes from the surrounding environment, apart from academics, for example lack of vacation time, traffic jams, and an uncomfortable living environment.

CONCLUSION

Based on the results of the research that has been carried out, it can be concluded that:

a. There were 6 samples (60%) that were abnormal and 4 samples (40%) that were normal.
b. The lowest uric acid level in obese students was 3.7 mg/dl and the highest level was 7.8 mg/dl, with an average value of 6.1 mg/dl

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