Correlation Between Nutritional Status and Physical Performance With Uric Acid Levels in The Elderly

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Abstract: Gout is a degenerative disease and often occurs in the elderly. One of the causes of gout is nutritional disorders, where someone with an excessive body mass index (BMI) tends to have a higher risk of developing gout than someone with a lower or normal BMI. Physical performance is also closely related to uric acid levels in the blood. This research is to determine the correlation between nutritional status and physical performance with uric acid levels in the elderly at the Social Service Center of Tresna Werdha of Budi Luhur Bantul, Yogyakarta. Research design was a correlational descriptive with a cross-sectional approach. The sampling technique was simple random sampling with a sample size of 47 respondents. The research instruments used the Body Mass Index (BMI), the Physical Activity Scale for the Elderly (PASE) questionnaire, and an easy-touch tool to check uric acid levels. Bivariate analysis uses Kendall's Tau test. There was a correlation between nutritional status and uric acid levels in the elderly with a p-value of 0.020 (< 0.05) with a low correlation (r value 0.326). There was a correlation between physical performance and uric acid levels in the elderly with a p-value of 0.027 (< 0.05) with a low correlation (r value 0.321). There was a significant correlation between nutritional status and physical performance with uric acid levels in the elderly with a correlation in the low category. Nurses can provide interventions such as exercise and uric acid checks regularly for the elderly so that the elderly's health status can be maintained.

1. 1 INTRODUCTION

Gout commonly known as gouty arthritis is a degenerative disease characterized by increased uric acid levels in the blood (hyperuricemia). Increased uric acid levels can cause disorders in the human body such as feelings of pain in the joint area and are often accompanied by extreme pain for the sufferer (Suiraoka, 2012).

The incidence of gout in both developed and developing countries is increasing in line with a person's age, in men, especially at the age of 40-50 years, while in women the percentage of uric acid begins to be found after entering menopause (Susanto, 2013). In Indonesia, based on Best Practice & Research Clinical Rheumatology data in 2010 on 4683 adults, shows that the prevalence rate of gout and hyperuricemia in men is 1.7% and 24.3%, where the ratio of men to women is 34:1 for gout and 2:1 for hyperuricemia (Smith, 2010).

One of the causes of gout is a disturbance in body mass index, where someone with an excessive body mass index (BMI) tends to have a higher risk of developing gout, although someone with a lower or normal BMI can also have this risk. According to Augne & Vatten (2014), excessive body mass index or obesity significantly affects uric acid levels in the blood compared to people with underweight or low body mass index.

Activities carried out by humans are also closely related to the levels of uric acid in the blood. Strenuous activities, such as physical activities that are carried out continuously to increase the pulse rate and breathing faster than usual, can aggravate gout, which is characterized by increased levels of uric acid in the blood. This occurs due to increased levels of lactic acid in the blood which has an impact on reducing the excretion of uric acid through the kidneys so that the uric acid content in the body increases (Welis, Wilda, Sazeli, 2013).

The results of a preliminary study conducted at the Tresna Werdha Bantul Social Services Center of Bantul Yogyakarta showed that the majority of elderly people living in institutions were still able to carry out physical activities such as washing clothes, sweeping, making crafts, and exercising. As a result

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of interviews with nursing home administrators, data was obtained on several diseases suffered by elderly people in nursing homes, namely gout, hypertension, and diabetes mellitus.

Based on the description above, researchers are interested in knowing the correlation between nutritional status and physical activity with uric acid levels in the elderly at the Tresna Werdha Social Service Center of Budi Luhur Bantul, Yogyakarta.

2. METHODS

2.1 Research Design

This research is quantitative descriptive correlational research with a cross-sectional approach, which aims to reveal the correlation between nutritional status and physical activity with uric acid levels in the elderly where data collection is carried out simultaneously at the same time. This research was conducted at the Tresna Werdha Social Service Center of Budi Luhur Bantul Yogyakarta in April-May 2018.

2.2 Sample Research

The population in this study was all elderly people at the Tresna Werdha Social Services Center, totaling 88 people. The sample in this study was 47 elderly people taken by simple random sampling using random number techniques who met the research criteria. The inclusion criteria for this study were willingness to be a research subject by signing informed consent, elderly people who had lived in an institution for more than 30 days, and elderly people with at least elementary school education or equivalent. Meanwhile, the exclusion criteria for this study were that elderly people were not present at the time of data collection, and elderly people were sick at the time of data collection.

2.3 Data Analysis Research

The instruments used in this research are calibrated scales and height meters to measure Body Mass Index (BMI). The instrument for assessing physical activity uses the Physical Activities Scale for the Elderly (PASE) questionnaire which was adopted from Nafidah (2014) which consists of 8 favorable question items that have been tested for validity and reliability with Alpha-Cronbach results of 0.723 (> 0.60). Meanwhile, the instrument used to measure uric acid levels is easy-touch and has been calibrated according to SI standards (International Units).

Data analysis in this study consisted of univariate analysis and bivariate analysis. Univariate analysis was used to analyze research variables descriptively, namely data on respondent characteristics. Bivariate analysis in this study used Kendall's Tau test because the data was on an ordinal scale to determine the correlation between nutritional status and physical activity with uric acid levels in the elderly (Sugiyono, 2015).

This research also pays attention to ethics in research, which includes informed consent, anonymity, confidentiality, and benefits.

3. RESULTS

Table 1. Characteristics of Respondent

Categories		Frequency (f)	Precentation (%)
Age	51-60 years	1	2,1
	61-70 years	28	59,6
	71-80 years	17	36,2
	>80 years	1	2,1
Gender	Men	16	34,0
	Female	31	66,0
	Total	**47**	**100,0**

Based on Table 1, it can be seen that the majority of respondents were aged 61-70 years, namely 28 people (59,6%). Majority of responden were female, namely 31 people (66,0%).

3.1 Analysis

According to Table 2, it was known that the majority of respondents had nutritional status in the normal category, namely 29 people (61.7%) and the majority of respondents had uric acid levels in the normal category, 35 people (74.5%). Based on the table, it can also be seen that there was a significant correlation between nutritional status and uric acid levels in the elderly at the Tresna Werdha Social Service Center of Budi Luhur Bantul Yogyakarta, with a significance value of p 0.020 (< 0.05) and the strength of the correlation in the weak category with r value 0,326.

Table 2. Correlation of Nutritional Status with Uric Acid Level In the Elderly

Nutritional Status	Uric Acid Level						p	r
	Normal		Abnormal		Total			
	f	%	f	%	f	%		
Normal	25	86,2	4	13,8	29	100,0	0.020	0,326
Obesity	5	55,6	4	44,4	9	100,0		
Obesity 1	5	62,5	3	37,5	8	100,0		
Obesity 2	0	0,0	1	100,0	1	100,0		
Total	35	74,5	12	25,5	47	100,0		

Based on Table 3, it can be seen that the majority of respondents had physical activity in the good category, namely 35 people (74.5%). Based on the table above, it can also be seen that there was a correlation between physical activity and uric acid levels in the elderly at the Tresna Werdha Social Services Center of Budi Luhur Bantul Yogyakarta, with a significance value of p 0.027 (< 0.05) and the strength of the correlation in the weak category with a correlation value of r 0.321.

Table 3. Correlation of Physical Performance with Uric Acid Level In the Elderly

Physical Performance	Uric Acid Level						p	r
	Normal		Abnormal		Total			
	f	%	f	%	f	%		
Good	29	82,9	6	17,1	35	100,0	0.027	0,321
Enough	5	50,0	5	50,0	10	100,0		
Less	1	50,0	1	50,0	2	100,0		
Total	35	74,5	12	25,5	47	100,0		

4. DISCUSSION

According to the result majority samples were aged 61-70 years. It was in line with Suiraoka (2012), in the elderly along with the aging process, there will be a decline in the function of the body's systems. In general, the musculoskeletal system in the elderly will experience deterioration, especially in most of the joints that support body weight. Based on the table 1, it can also be seen that the majority of respondents were female. According to Susanto (2013), the tendency for high uric acid levels in women is due to entering menopause, where in this phase the amount of the estrogen hormone in the body also begins to decrease.

Based on the Table 2 above, it can also be seen that as many as 18 respondents were obese. According to Welis, Wilda, Sazeli (2013),obesity occurs due to excess calorie intake from normal needs accompanied by a lack of burning calories through physical activity. Purwaningsih (2009) also stated that someone who is overweight usually has a pattern of eating more than they need, in this diet there is also the possibility of excessive purine intake in addition to the intake of carbohydrates, protein, and fat. Apart from that, excess body weight can also cause pressure on the joints so it was difficult for uric acid to be excreted from the body.

Based on Table 2, it was also known that 4 respondents had normal nutritional status but had high uric acid levels. This condition can occur due to high purine intake. High purine intake can occur in both respondents with normal nutritional status and respondents who are overweight. Nutritional status cannot be used to determine purine intake, but can only reflect fat intake, carbohydrate intake, and uric acid clearance status (Purwaningsih, 2009). In line with Damayanti (2012), states that healthy living behaviors to avoid gout are controlling purine intake, consuming sufficient amounts of water (10-12 glasses per day), and consuming foods high in fiber.

According to Beavers, Fang-Chi Hsu, Monica, et al (2014), activities carried out by humans are closely related to uric acid levels in the blood. In the elderly, as they get older, the function of the body's systems decreases and the body's strength to carry out physical activities also decreases. Even though the elderly experience a decline in body function and strength, it was hoped that the elderly can still be active and productive by exercising, doing light physical activity according to their abilities, and moving regularly or continuously to keep the body healthy and prevent disease. In line with Damayanti (2012), that normal uric acid levels can also be influenced by exercise habits such as exercise and walking. Exercise has been proven to improve body strength and joint flexibility, thereby reducing the risk of joint damage due to arthritis.

5. CONCLUSION

There was a significant correlation between nutritional status and physical activity with uric acid levels in the elderly at the Tresna Werdha Service Center of Budi Luhur Bantul, Yogyakarta with a close correlation in the low category. Health workers especially nurses can provide interventions such as exercise and uric acid checks regularly for the elderly so that the elderly's health status can be maintained.

REFERENCES

Augne, D. & Vatten, L. J. (2014). Body Mass Index and The Risk of Gout: A Systematic Review and Dose Response Metal-Analysis of Prospective Studies. European Journal of Nutrition, 53(8), 1591–1601.

Beavers K, Fang-Chi Hsu, Monica C.Serra, Veronica Yank, Marco Pahor, B. J. N. (2014). The effect of a long term physical activity intervention on serum uric acid in older adults at risk for physical disability.

Damayanti. D. (2012). Mencegah dan Mengobati Asam Urat. Araska.

Nafidah. (2014). Hubungan Antara Aktivitas Fisik dengan Tingkat Kognitif Lanjut Usia di Panti Sosial Tresna Werdha Budi Mulya 4 Marga Guna Jakarta Selatan. UIN Syarif Hidayatullah. repository.uinjkt.ac.id/.../1/NUR NAFIDAH - fkik.pdf

Purwaningsih T. (2009). Faktor-faktor Risiko Hiperurisemia. http://eprints.undip.ac.id/ 24334/1/TI

Smith, C. D.-T.-R. (2010). Epidemiology of gout: An update. Best Practice & Research Clinical Rheumatology, 811–827.

Sugiyono. (2015). Metode Penelitian Pendidikan (Pendekatan Kuantitatif, Kualitatif dan R&D). Alfabeta.

Suiraoka. (2012). Penyakit Degeneratif. Nuha Medika.

Susanto, T. (2013). Asam Urat: Deteksi, Pencegahan, Pengobatan. Buku Pintar.

Welis, Wilda, Sazeli, R. M. (2013). Gizi untuk Aktivitas Fisik dan Kebugaran. Sukabina Press.