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THE CORRELATION BETWEEN PHYSICAL ACTIVITY AND STRESS AND THEIR IMPACT ON URIC ACID LEVELS IN OLDER INDIVIDUALS

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ABSTRACT

The elderly population, who are more susceptible to infection and chronic illnesses, are particularly susceptible to gout. The Pakong Health Center Working Area has a high prevalence of gout among the elderly population. The study examines the relationship between physical activity and stress, with uric acid levels as the dependent variable. The study involved 60 patients with gout, with a sample size of 53. The DASS physical activity questionnaire was used to gather data. The results showed that 77% of participants engaged in moderate physical activity, while almost 40% fell into the moderate stress group. The majority of uric acid levels were elevated, with 36 out of 68% being elevated. The Spearman Rank analysis yielded a p-value of 0.005, indicating a correlation between physical activity and uric acid levels in the elderly. Additionally, a p-value of 0.000, indicating a link between stress levels and gout occurrence, suggests that older individuals should enhance their physical activity and manage their nutrition to lower uric acid levels. Additionally, seniors should reduce stress by improving their religious practices, expressing their concerns, and maintaining a positive mindset.

Keywords

Physical Activity, Stress, Gout, Elderly

INTRODUCTION

Elderly (elderly) is a process of decreasing the ability of tissues to maintain normal function or repair themselves so that they are unable to survive if there is an infection or repair themselves if there is damage experienced (Aspiani , 2014 in Yunaspi 2021). On average, elderly people will experience degenerative diseases, one of which is gout (Simamora, 2018).

Uric acid is a chemical compound in the form of the final product of the breakdown of purines or waste products in the body, including the results of purine catabolism assisted by the enzymes guanase and xanthin oxidase. Sinaga et al (2014) in Megawati et al (2019).

According to the American College of Rheumatology, gout is a disease and potential disability caused by arthritis where the symptoms are pain in the joints, with levels in women > 6 mg/dl and men > 7 mg/dl (Febriyanti et al., 2020).

Gout sufferers are increasing every year, according to the World Health Organization (WHO), in 2017 uric acid in the world was 34.2% and in 2018 WHO predicts that around 355 million people in the world will experience gout, even the incidence of gout in In Indonesia in 2018 it was 7.3%, where if seen from the signs and symptoms it was classified as a joint disease, and in the East Java region, data showed that the number of sufferers was around 6.72%, which varied across various populations (Rikesdas, 2018). Gout sufferers in Indonesia in 2019 were

among the highest in Asia, reaching 81% (Novianti et al., 2019). Based on initial observations carried out in the Pakong Community Health Center work area, Pamekasan Regency, data was obtained on elderly people suffering from gout at the end of 2022, a total of 109 people with the highest number of sufferers being in Pakong Village, namely 60 people.

Elevated uric acid levels can be caused by various risk factors: increasing age, genetics, gender, obesity, medications (such as diuritics), physical exercise and fatigue, high purine diets, alcoholic drinks, stress, and complications of diseases such as hypertension or chronic kidney failure (Rokhimah Puji Harlina et al., 2020). One factor that can influence uric acid levels is physical activity. The activities a person does are related to the level of uric acid in the blood. Physical activity, such as exercise or physical movement, will reduce uric acid excretion and increase lactic acid production in the body. The heavier the physical activity that is carried out and lasts for a long period, the more lactic acid is produced (Azari, 2014 in Dasawisma et al., 2018). Confused thoughts (stress) can stimulate the release of the hormones cotsiol, adrenaline, and norepinephrine which causes increased heart work and increased blood pressure/hypertension (Timotius et al., 2019). Hypertension causes the kidneys to switch functions to remove sodium in the body to lower blood pressure, so that the kidney's function in excreting uric acid is disrupted, which results in increased purine levels in the blood so that the increased purine levels cannot be processed optimally and accumulate in the body, resulting in high acid levels. veins and increasing pain in the phallus (2012) (Febrianti et al., 2019). This is in accordance with what was stated in research conducted by Dewi & Setiyaningrum, 2020, that the results of research data analysis conducted partially showed that stress had a positive correlation with increasing blood pressure which could have an impact on increasing purine levels in the blood.

The impact that will occur if high uric acid levels can cause very severe pain in the joints so that it has a bad impact when you want to do physical activities such as sitting, standing and walking. The buildup of urate crystals in the joints over a long period of time will result in joint damage, causing pain. Physical activity carried out by humans is related to the level of uric acid in the blood. (Ekasari, 2018 in Yunaspi, 2021) .

Possible treatment _ done For reduce impact sour veins so as not to the more severe and even emotional impact _ is use treatment pharmacology (use Allopurinol and medication Uricosuric like Probenecid and Sulfinpyrazone) or non- pharmacological 4 (adequate rest , use compress warm , low diet purine , reducing intake alcohol and lowering body weight , as well reduce stress) Nurarif (2015) in Hidayah (2019) .

RESEARCH METHODS

. The population of elderly people suffering from gout in the Pakong Health Center working area is 60 elderly patients with a sample of 53 with a *non-probability* sampling technique using a *probability random sampling* technique .

RESULTS AND DISCUSSION

Table: Frequency distribution of respondents based on uric acid levels in the work area Health Center Pakong

No	Gout _	Frequency	Percentage (%)
1	Normal	7	13
2	Tall	46	87
	Amount	53	100

Source : Primary Data August 2023

Based on the table above, it shows that almost all respondents had high uric acid levels, 46 (87%), and a small number of respondents had normal uric acid levels, 7 (13%).

Table of frequency distribution of respondents based on physical activity in work area Health Center Pakong

No	Activity Physique	Frequency	Percentage (%)
1	Light	3	5,6
2	Currently	34	64.2

3	Heavy	16	30.2
	Amount	53	100

Source : Primary Data, August 2023

Based on the table above, it shows that the majority of physical activity was moderate, numbering 34 (64.2%).

Table of frequency distribution of respondents based on stress level in work area Health Center Pakong

No	Stress level	Frequency	Percentage (%)
1	Normal	14	26
2	Light	10	19
3	Currently	21	40
4	Critical	8	15
5	Very serious	0	0
	Amount	53	100

Source : Primary Data, August 2023

Based on the table above, it shows that almost half of the respondents had a moderate level of stress, 21 (40%), a small number of respondents had a normal stress level, 14 (26%), a mild stress level, 10 (19%), and a severe stress level. a total of 8 (15%).

Relationship between physical activity and uric acid levels in the elderly in the Pakong Community Health Center working area

Cross-tabulation table of the relationship between physical activity level and acid incidence
veins in the Pakong Community Health Center working area

Activity Level physique	Uric Acid Levels				Total		*pValue*
	Normal		Tall				
	n	%	N	%	N	%	
Light	3	5,6	0	0	3	5,6	*0.005*
Currently	4	7.6	30	56.6	34	64.2	
Heavy	0	0	16	30.2	16	30.2	
Total	**7**	**13.2**	**46**	**86.8**	**53**	**100**	

Source : Primary Data, August 2023

Based on results study From the results of the *Chi Square* statistical test , it was obtained mark *Pearson Chi-Square Asymptotic Significance (2-sided)* = 0.005 means mark *Asymptotic Significance (2-sided)* = < α (0.05). Thus, it can be concluded that H0 is rejected and Ha is accepted, which means there is a significant relationship between physical activity and uric acid levels in the elderly in the Pakong Community Health Center working area.

Researchers are of the opinion that respondents carry out moderate physical activity because the activities carried out by respondents are only work that is not too heavy, such as sweeping, cooking, washing dishes, moving furniture, walking leisurely at home, and gardening. Apart from that, there are those who work as entrepreneurs and this is a routine activity that is carried out every day. The respondents' high uric acid levels were caused by lack of knowledge, consuming foods high in purine, being overweight and age. Lack of knowledge about factors that can increase uric acid levels and how to prevent them so that they cannot regulate their diet. High uric acid levels can affect physical activity.

The results of this research are the same as research conducted by Ditte Ayu Suntara et al, (2022). Based on the results of the Chi-Square analysis, it is known that the p value is 0.005<0.05 (which is shown in the Asymp.Sig column) in the computer output, so Ho is rejected and Ha is accepted, meaning that there is a relationship between physical activity and uric acid (gout) levels in elderly.

These results are in accordance with research by Wicaksono (2020) which states that physical activity is any form of body movement that occurs due to skeletal/skeletal muscle contractions which causes an increase in calorie needs or the body's calorie use exceeds energy needs in a resting state. Physical activity is related to uric acid levels in the elderly, high uric acid levels are caused by consuming foods that contain purine. Excessive purine causes pain in the joint area accompanied by inflammation or swelling so that it can interfere with carrying out daily activities.

These results are in accordance with research by Aspiani (2014) in Yunaspi (2021) which states that activities carried out by humans are related to uric acid levels in the blood. Physical activity such as exercise or physical movement will reduce uric acid excretion and increase lactic acid production in the body. Physical activity can affect uric acid levels because physical activity will cause an increase in lactic acid. This lactic acid will reduce uric acid production. If uric acid cannot be excreted by the kidneys, uric acid will build up.

According to Songgigilan et al (2019) who stated that high uric acid levels can be caused by two main possibilities, namely excess production of uric acid in the body or obstruction of uric acid removal by the body. Excess uric acid production can be influenced by the type of food consumed, alcohol consumption, and obesity. Meanwhile, obstructed elimination can be influenced by drugs such as diuretics and kidney disease or intoxication.

These results are in accordance with research by Pursriningsih and Panunggal (2015) in Veranica Emilia, Lutfi Nurdian Asnindari (2021) who stated that one of the causes that influences uric acid levels is exercise or physical activity. Exercise or physical movement will cause an increase in lactic acid levels. Lactic acid is formed from the glycolysis process that occurs in muscles. If muscles contract in anaerobic media, namely media that does not have oxygen, glycogen, which is the final product of glycolysis, will disappear and lactate will appear as the main final production. An increase in lactic acid in the blood will cause a decrease in uric acid excretion by the kidneys.

The Relationship between Stress Levels and Uric Acid Levels in the Elderly in the Pakong Health Center Working Area

Cross tabulation table of the relationship between stress levels and acid events
veins in the Pakong Community Health Center working area

Stress level	Uric Acid Levels				Total		*pValue*
	Normal		Tall				
	n	**%**	**n**	**%**	**N**	**%**	
Normal	7	13.2	7	13.2	14	26.4	*0,000*
Light	0	0	10	18.9	10	18.9	
Currently	0	0	21	39.6	21	39.6	
Critical	0	0	8	15.1	8	15.1	
Total	**7**	**13.2**	**46**	**86.8**	**53**	**100**	

Source : Primary Data, August 2023

Based on the research results, almost half of the respondents (39.6%) had moderate stress levels and high uric acid levels (39.6%). The results of *the Cji square* test obtained a *p value* <0.05, namely $p = 0.000$, meaning that H_0 is rejected and H_1 accepted, then it is stated that there is a relationship between stress levels with uric acid levels in the elderly in the Pakong Health Center working area.

The elderly in the Pakong Community Health Center work area have moderate levels of stress due to aging, heavy physical activity, illness, family conflict, lack of adaptability, and work load. This is what will trigger the production of hormones that stimulate an increase in purine metabolism in the body so that uric acid levels in the elderly are high.

The results of this research are in line with research conducted by Jaliana & Suhadi (2018) that one of the factors related to the incidence of gout is stress. The *chi square test results obtained were OR* = 2.743 with *a lower limit of 1.238* and *an upper limit of 6.078*

where someone who experiences stress will increases the purine metabolism system in the body so that uric acid levels will also increase. Another research conducted by Huda *et al* (2018) shows that there is a relationship between stress levels and the incidence of gouty arthritis pain in the elderly in the work area of the Alianyang Community Health Center, Pontianak City, with a test result of *p* = 0.002 where respondents experienced stress due to their physical condition starting to become unbalanced. such as heavy physical activity and being mentally unprepared to deal with gouty arthritis which tends to occur repeatedly and is made worse by the onset of pain.

REFERENCES

Afnuhaazi, R. (2019). Factors Associated with the Occurrence of Gout in the Elderly. Human Care, 4(1), 34–41.

Alfiyani, YI (2019). Differences in the effectiveness of giving salt water soaks and ginger water soaks on the pain scale in elderly people with gout. University of Muhammadiyah Malang.

Angriani, E., Dewi, AP, & Novayelinda, R. (2018). Factors Associated with the Incidence of Gouty Arthritis in the Malay Community. Let's Fkp, 5(2).

Arikunto, S. (2002). Research Procedures (revised ed.). Jakarta: Rineka Cipta.

Arjanto, P. (2022). Reliability and Validity Test of Depression Anxiety Stress Scales 21 (Dass-21) on Students. 7.

Atiqah, H. (2020). The relationship between the cognitive function of the elderly and the level of independence of the elderly in the elderly posyandu, Balearjosari sub-district, Malang. 07(02), 107–114.

Buanasari, A. (2019). Description of Stress Levels in the Elderly. Journal of Nursing, 7(2).

Bulu, I.C. (2019). The Relationship Between Age, Gender and Body Mass Index and Community Uric Acid Levels in Rt 39 Rw 12 Fatululi Subdistrict, 2019. Scientific Writing, 1–50.

Dasawisma, DI, Anggrek, I., & Antariksa, PB (2018). Abdimas News No. 02 Year I/December 2018. 02, 122–130.

Dewi, N., & Setiyaningrum, R. (2020). The Role of Stress on Blood Pressure and Uric Acid Levels in Heads of the Family. Proceedings of the National Seminar on Psychology, 12–23.

Dina, A., Lubis, A., Lestari, IC, Medicine, F., Islam, U., Utara, S., Medicine, F., Islam, U., Utara, S., Articles, H., Workshop , D., Kunci, K., Body, IM, Dina, A., & Lubis, A. (2020). Ibn Nafis Medical Journal. 9(1), 1–7.

Ditte Ayu Suntara, Afif D Alba, MH (2022). 3) 1,2,3. 2(12), 3805–3812.

Fauzi, M. (2018). Relationship between physical activity and uric acid levels in Padukuhan Bedog Trihanggo Gamping Sleman Yogyakarta. Nursing Science, 11.

Febrianti, E., Asrori, & Nurhayati. (2019). The Relationship Between Increased Blood Uric Acid Levels and the Incident of Hypertension at Bhayangkara Hospital, Palembang, 2018. Health Analyst Journal, 8(1), 18.

Febriyanti, T., Nubadriyah, Wiwit Dwi, & Dewi, Ni Luh Diah Ayu Sita. (2020). Relationship between the ability to regulate a low purine diet and uric acid levels. 8(1), 72–79.

file:///C:/Users/fc/Downloads/HDSS Sleman-_Buku-Saku-Kader Pengontrolan-Asam-Urat-di-Masyarakat-_cepatan-II (1).pdf

Firdayanti, Susanti, and Muhammad Azdar Setiawan. "Gender and Age Differences in Uric Acid Levels in Hyperuricemia Sufferers." Udayana Medical Journal 8.12 (2019): 2597-8012.

Fitriani, R., Azzahri, LM, Nurman, M., & Hamidi, MNS (2021). The relationship between diet and uric acid levels (gouty arthritis) in adults aged 35-49 years. 5(23), 20–27.

Fitriko, A. (2019). The Effect of Hypnomotivation on Physical Mobilization in Stroke Patients in the Neurology Room at Rsud.Prof.Dr.Ma.Hanafiah Sm Batusangkar 2019. Padang Pioneer Stickers.

Gemini, S., Yulia, R., Roswandani, S., Pakpahan, HM, Setiyono, E., Hardiyati, Ardiansyah, S., Jalal, Novita Maulidya,

Simanullang, P., & Sigalingging, G. (2021). Gerontic Nursing (1st Ed.). Muhammad Zaini Publishing Foundation.

Hambatara, SA, Sutriningsih, A., & Warsono. (2018). The relationship between consumption of foods containing purine and uric acid levels in the elderly in Tulungrejo Village, Ngantang District. Nursing News, 3(1), 719–728.

Hidayah, N. (2019). Nursing Care for Elderly People with Gouty Arthritis at the Tresna Werdha Nirwana Puri Samarinda Social Home.

Huda, Siti Annisa, Usman, & Herman. (2018). The Relationship Between Stress Levels and the Incidence of Gouty Arthritis Pain in the Elderly in the Working Area of the Alianyang Community Health Center, Pontianak City. Cape, 1(4), 1–11.

Husna, AR, Iliza, NE, & Mukarromah, N. (2021). The Relationship between Cultural Values and the Incident of Hypertension in the Elderly. Muhammadiyah Nursing Journal, 6(3).

Jaliana, & Suhadi. (2018). Factors Associated with the Incidence of Gout in Bahteramas Regional Hospital, Southeast Sulawesi Province in 2017. Jimkesmas, 27(3), 472.E7-472.E10.

Indonesian Ministry of Health. (2017). National Health Research and Development Ethical Guidelines and Standards. Indonesian Ministry of Health, 1–158.

Kurniawati, DA, Adi, MS, & Widyastuti, RH (2020). Stress Levels of Elderly People with Non-Communicable Diseases. Journal of Nursing, 8(2), 123–128.

Lantang, GE, & Rayanti, RE (2019). Mental Health Status of Gouty Arthritis Patients in Tomohon City. Bakti Tunas Husada Health Journal, 19(2), 226–235.

Larasati Andarbeni, EP (2019). Differences in uric acid levels in elderly women with obese and non-obese body fat percentages.

Leokuna, WI, & Malinti, E. (2020). Relationship between Body Mass Index and Uric Acid Levels in Adults in East Oesapa. Nursing Inside Community, 2(3), 94–99. http://jurnal.stikesnh.ac.id/index.php/nic/article/view/342.

M. Zaki, S. (2021). Study of the Formulation of Statistical Hypotheses in Research Hypothesis Testing. 4, 115–118.

Magfira, N., & Adnani, H. (2021). The Relationship Between Physical Activity and Genetic History and Uric Acid Levels at Posyandu Cinta Elderly. Journal of Nursing and Midwifery Science, 12(2), 396. Https://Doi.Org/10.26751/Jikk.V12i2.1033

Masturoh, I., & Anggita, N. (2018). Health Research Logical Methods. 7(2), 1–16.

Megawati, A., Yuliana, S., Tinggi, S., Health, I., & Utama, C. (2019). Test the effect of ethanol extract of ginger rhizomes. 3(2), 85–95.

Minggawati, ZA, Fauziah, SN, Rusmita, E., & Arthritis, G. (2018). Knowledge of gouty arthritis sufferers about gouty arthritis in the Pasirlayung Community Health Center, Bandung City. 4–5.

Muladi, A., Setiawati, Y., Tinggi, S., Health, I., & Belas, T. (nd). Seventeenth Health Journal (Jurkes TB) issn: 2715-0976 relationship between a low purine diet and uric acid levels in gout sufferers. 1(1), 1–6.

Mutiara Ridhoputrie, Dewi Karita, M Fadhol Romdhoni, AK (2019). Herb-Medicine Journal ISSN: 2620-567X, Relationship between diet and lifestyle with uric acid levels in pre-elderly and elderly people in the working area of Puskesmas I Kemangan, Banyumas, Central Java. 2(april), 43–50.

Notoadmojo, S. (2018) Health Research Methodology. Rineka Cipta: Jakarta

Novianti, A., Ulfi, E., Hartati, L., & S. (2019). Relationship between gender, nutritional status, consumption of milk and its products and uric acid levels in the elderly. Indonesian Journal of Nutrition, 7(2), 133–137. https://Doi.Org/Https://Doi.Org/10.14710/Jgi.7.2

Nugroho, W. (2008). Gerontic and Geriatric Nursing. Agc.

Nurlita Kurnia Wijaya, EUSDW (2020). Indonesian journal of community (

Community Nursing Journal). 4 (2), https://doi.org/10.20473/ijchn.v4i2.12365.

Nursalam. (2020). Nursing Science Research Methodology: A Practical Approach 5th Edition (5th Ed.). Salemba Medika.

Patricia, H., Niken, & Usmarini, W. (2018). The effect of boiled soursop leaves (Annona muricata L.) on reducing pain intensity in gout sufferers in the working area of the Koto Lolo Community Health Center, Sungai Banyak City. Saintika Meditory Health Journal Saintika Meditory Health Journal, 1(August), 79–88. http://jurnal.syedzasaintika.ac.id/index.php/meditory/article/view/244.

Pratiwi, RD (2022). Medical check: vital signs, uric acid and blood sugar levels. 3(1), 33–40.

Purawanto, DI (2017). The effect of health education about a low purine diet on compliance with gout sufferers. STIKES Jombang Medical Scholars.

Raudhoh, S. (2021). Fun elderly, active elderly, productive elderly.

Rikesdas. (2018). Basic Health Research. RI Ministry of Health's involvement.

Rokhimah Puji Harlina, Arifin, MZ, & Rahmawati, A. (2020). Description of Uric Acid Levels in the Elderly. Mualawarman University Health Journal, 1(2), 5–24.

Setiawati, TI, & Ismahmudi, R. (2020). The Relationship between Work and Education and the Level of Depression in the Elderly at the Elderly Posyandu in the Working Area of the Wonorejo Samarinda Community Health Center. Borneo Student Research (Bsr), 1(3), 1474–1478. Https://Journals.Umkt.Ac.Id/Index.Php/Bsr/Article/View/1117

Simamora, RH (2018). Audiovisual Media Application for Health Education: Impact of Gout on Health in Village Areas Assisted by the Faculty of Nursing, University of North Sumatra in 2018.

Songgigilan, A.M., Rumengan, I., & Kundre, R. (2019). The Relationship Between Diet and Level of Knowledge and Uric Acid Levels in the Blood in Gouty Arthritis Sufferers at the Ranotana Weru Community Health Center. Journal of Nursing, 7(1), 1–8. https://doi.org/10.35790/jkp.v7i1.24325.

Sutiono, MD, & Hatmanti, NM (2018). The Relationship Of Family Support With Uric Acid's Diet Compliance In Elderly At Posyandu Elderly Working Area Wonokromo Health Care Center Surabaya: The Relationship Of Family Support With Uric Acid's Diet Compliance In Elderly At Posyandu Elderly Health Care Center Won. Unusa, 4(2), 125–132.

Timothy, Kurniadi, I., & Rahayu, I. (2019). Purine and Pyrimidine Metabolism (E. Risanto (Ed.); 1st Ed.). Andy.

Wicaksono, A. (2020). Safe physical activity during the Covid-19 pandemic. 8, 10–15.

Yunaspi, D. (2021). The Relationship Between Physical Activity and Uric Acid (Gout) Levels in the Elderly in the Batu Aji Community Health Center Working Area, Batam City. 2, 1–7.

Yustari, A., & Sari, J.D.E. (2020). Differences in Life Satisfaction Levels of Working Mothers and Housewives. Ikesma, 16(1), 1. https://Doi.Org/10.19184/Ikesma.V16i1.14757