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EC NURSING AND HEALTHCARE
Research Article

Effect of Ergonomic Gymnastics on Acid Levels Reduction Veins in the Elderly

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Received: May 09, 2022; **Published:** June 30, 2022

Abstract

The background of uric acid levels a disorder of purine metabolism in the presence of hyperbolic causes painful bones and joints, usually due to lack of exercise. This research was queasy experimental design with non-equivalent control group design. The aim of this research was to know the effect of ergonomic gymnastics on decreased uric acid levels in elderly. Sampling technique used non probability sampling with purposive sampling technique or judgment sampling. Samples collection used to choose samples that meet the criteria of research for 1 week, so that the number of samples was met as many as 20 people, with the division of 10 people the treatment group and 10 people control group. Wilcoxon signed ranks test at uric acid level of pretest and posttest in treatment group. The result of treatment group got the value 0,007 or p > 0,005, It meant that there was significant the effect of ergonomic gymnastics on decreased uric acid levels in elderly at RT 01 RW 07 Kel Bangkala, Manggala. Therefore, it is expected that the community, especially the people of uric acid levels should perform ergonomic gymnastics independently and regularly, but it is also necessary regulation of healthy lifestyle in order to prevent more severe complications.

***Keywords**: Uric Acid Levels; Elderly; Ergonomic Gymnastics*

Introduction

The older a person the more diseases that appear often suffered, especially in the elderly or elderly. In the elderly there will be various setbacks in the organs of the body, while problems occur due to lack of exercise and irregular diet so that the young elderly are exposed to gout. In ergonomic gymnastics or physical movements can reduce uric acid levels in the elderly, through some movements that have been done in ergonomic gymnastics. That the elderly are not aware of the unhealthy habits of life so that it can cause a symptom of uric acid levels in the elderly.

Gout is a health problem that is quite dominant in various countries, both in other countries, although the prevalence of gout in the world globally has not been recorded. Uric acid is approximately 2.6 - 47.2% which varies in various populations, while uric acid also varies from 1 - 15.3% [1]. Research in Taiwan, in 2005 - 2008 showed an increase in the incidence of gout in elderly women by 19.7% and

gout in elderly women by 23.3% [2]. Gout is an acute inflammatory disorder characterized by pain due to the accumulation of monosodium urate crystals in joints and soft tissues in the body 3]. Gout is characterized by increased uric acid levels > 7 mg /dl in men and > 6 mg/dl in women [4].

The World Health Organization (WHO) classifies the elderly into 4, namely: middle age (middle age) is 45 - 59 years, elderly (elderly) is 60 - 74 years old, elderly (old) is 75-90 years old and very old age (very old) is over 90 years (Nugroho 2012). According to article 1 paragraph (2), (3), (4). Law N0.13 of 1998 on health is said that the elderly is someone who has reached the age of 60 years [5].

The elderly population in recent years has increased significantly, in 2007 the number of elderly people in Indonesia amounted to 18.96 million people and increased to 20,547,541 people. The U.S. Census Bureau, International Data Base, said the number was among the fourth largest after China, India and Japan. In 2012 the number of elderly in Indonesia increased to 26,094,851 people (Ministry of Health, 2013). The World Health Organization (WHO) 2009 stated that the elderly population in Indonesia in 2020 will reach 11.34% or recorded 28.8 million people, which causes the largest number of elderly people in the world (Central Statistics Agency, 2011).

Eating habits are important factors that affect the health status and physical ability of an elderly person. If the age increases, the number and frequency of meals consumed will decrease when compared with the younger group where in the elderly there is a deterioration of cells due to the aging process that causes various types of diseases such as increasing uric acid levels (hyperuricemia). (Lumonon, Bidjuni and Hanel, 2015).

This is caused by a decrease in the function of the kidneys, resulting in a decrease in the excretion of uric acid in the renal tubules in the form of urine. In addition, due to the aging process there is a decrease in the production of letter enzymes so inhibited. Hyperuricemia is defined as serum uric acid levels of more than 7 mg/dL in men and more than 6 mg/dL in women (Walker and Edwar, 2013). Uric acid levels in men range from 3.5 - 7 mg/dL, while in women range from 2.6 - 6 mg/dL.

Hyperuricemia (gout) is a predisposing condition for gout, which is a disease that marks by deposition of monosodium urate (MSU) in certain joints and tissues such as in the joints of the feet so as to cause inflammation (uric acid). The buildup of uric acid in the renal tubules for a long time can cause progressive damage to the renal nephrons and will give rise to kidney stones and will end up with chronic kidney failure. In addition to the above problems, hyperuricemia has a relationship with mortality from various cardiovascular diseases, such as hypertension, coronary heart, and others [6].

Gout is one of the diseases that are widely found in men between the ages of 30 - 40 years, while in women aged 55 - 70 years, the incidence of women is rare except after menopause. In Indonesia, acid Veins are second only to osteoarthritis, the prevalence in Indonesia itself is estimated at 1.6 - 13.6/100,000 people, this prevalence increases with age. Socio-culture is one of the factors that affect uric acid levels (Lumonon,Bidjuni and Hanel, 2015).

Central Statistics Agency, Makassar in 2014 the number of elderly age groups 45 - 64 years is as many as 198,037 people and the number of elderly age groups aged 65 years and above is as many as 48,114 people. Aging is a characteristic of physiological processes and experiences irreversible differences in the physiological function of the elderly. This will have an impact on various aspects of health. The aging process causes a process of slowly losing the ability of tissues to repair themselves or replace and maintain their normal function so that they are unable to survive infection and repair the damage suffered [5].

The increase in the number of elderly is an indicator of the success of the development process, namely increasing life expectancy. The increasing life expectancy causes the number of elderly residents to continue to increase from year to year. According to the Central Statistics Agency (BPS), the number of elderly Indonesians reached 28 million people in 2012. Exercise therapy is one form of non-

pharmacological management with the aim of maintaining optimal joint position, reducing edema, stimulating reflex flexi extensions and preparation for active exercise if the acute phase is passed. The exercise therapy in question is Ergonomic Gymnastics. Ergonomic gymnastics movements are movements that are in accordance with the rules of body creation and these movements are inspired by the prayer movement. Ergonomic gymnastics is gymnastics that can directly open, clean, and activate all body systems such as the cardiovascular system, urinary, reproductive. (Suwartywati, Sukardian, and Astuti, 2012).

In the working area of the Bangkalah Health Center in RT 01 RW 07 obtained preliminary data on the number of elderly as many as 39 people and 20 people whose uric acid levels increased from the interview results of 10 elderly people who had a history of gout.

Methods

The design of the research conducted in this study is quasi experimental pretest and posttest nonequivalent control group design. Quasi-experimental is a research design that does not randomize in control groups or treatment groups [7]. Population is the overall subject of research to be studied [8]. The population in this study is all elderly. A sample is a portion or representative of the population to be studied or a portion of the number of characteristics possessed by the population. The size of the sample and meet the criteria for inclusion and exclusion, where the criteria determine the can and not of the sample [9].

Based on the sample, in this study there were 20 respondents, namely 10 samples of treatment groups given ergonomic gymnastics interventions and 10 samples that were used as a control group In the queasy experiment study which was divided into intervention groups and control groups, had provisions for homogeneous sample requirements in both groups, so that sample criteria were needed [10]. So that the results of the study are not biased, researchers also carry out the process matching that aims to reduce confounding variables both between the treatment group and the control group and between fellow respondents. The matching process between fellow respondent has been carried out since the contract reached a further stage. Physical exercise, in posyandu Carnation has the same sports schedule applied to residents (fit gymnastics), except for the elderly who have injuries. Food and calorie intake, each respondent was given the same food recall frequency (diet includes the same amount, type and time).

The data collection tools that will be used in this study are research instruments in the form of respondent characteristic data (name, age, and gender), diet and medical history (current health complaints, drugs that are routinely consumed), observation sheets (exercise implementation and uric acid level measurement results), food recall frequency sheets and uric acid level check devices. Gymnastics observations are used to observe gymnastics exercises carried out by respondents, while uric acid level observation sheets are used to record the examination of the respondent's uric acid levels, and to measure uric acid levels using a uric acid check tool, previously the uric acid check tool has been calibrated.

Result

This study is about the effect of ergonomic gymnastics on the decline of uric acid levels in the elderly in RT 01 RW 07 Kel Bangkala Kec Manggala which was implemented in June 2018. Respondents in this study were elderly people who suffered from acid levels with the number of respondents as many as 20 people with 10 respondents as a treatment group and 10 respondents as a control group.

This type of research is designed in the form of experimental queasy research, with research designs in the form of pre-tests and post-tests. This study was conducted for 8 days, where the first day was observed and pre-tested measurement of uric acid levels and introduction of gymnastics movements and then on the second to the eighth day given ergonomic gymnastics treatment, and on the eighth day also carried out posttest measurement of uric acid levels. Ergonomic exercises are given for 7 days with a frequency of 1 time a day for ± 20 minutes in the morning.

Univariate analysis

Characteristics of respondents

Age

Based on the table 1 above show that distribution the frequency of respondents based on age level is partial Respondents aged between 45 - 50 years, namely as many as 15 people or 75% while those aged 56 - 60 years as many as 5 peopleor 25%.

	Age					
	45 - 55		56 - 60		Sum	
Group	N	%	N	%	N	%
Treatment	8	40	7	35	15	75
Control	2	10	3	15	5	25
Total	10	50	10	50	20	100

Table 1: *Distribution of respondent frequency based on age in elderly with uric acid levels.*

Source: June 2018 primary data.

Gender

Based on the table 2 above indicates that the distribution frequency of respondents by gender is partial Female sex respondents were as many as 11 people or 55% while the male 9 people or 45%

	Gender					
	Man		Woman		Sum	
Group	N	%	N	%	N	%
Treatment	4	20	5	25	11	55
Intervention	6	30	5	25	9	45
Total	10	50	10	50	20	100

Table 2: *Distribution of respondent frequency by gender in the elderly with uric acid levels.*

Source: June 2018 primary data.

Education

Based on table 3 above shows that the distribution of respondent frequency based on Education is that some respondents do not finish/elementary school, which is as many as 6 people or 30% while the junior high school is 3 people or 15%. High school is 11 people or 55%.

	Not Finished		Junior		Senior high school		Sum	
Group	N	%	N	%	N	%	N	%
Treatment	4	20	3	15	3	15	10	50
Control	2	10	-	-	8	40	10	50
Total	6	30	3	15	11	55	20	100

Table 3: *Distribution of respondent frequency based on education on elderly with uric acid levels.*

Source: June 2018 primary data.

Work

Based on table 4, the distribution of respondent frequency based on work is IRT as many as 11 people or 55% while those who work as self-employed as many as 8 people or 40% and civil servants 1 person or 5%.

	IRT		Self-employed		Government staff		Total	
Group	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**
Treatment	6	30	4	20	-	-	10	50
Control	5	25	4	20	1	5	10	50
Sum	11	55	8	40	1	5	20	100

Table 4: *Distribution of respondent frequency based on work on elderly with uric acid.*

Source: June 2018 primary data.

Uric acid pre test and post test levels

Differences in uric acid levels in the blood in the treatment group before and after the treatment (Pre Test and Post Test) are seen in table 5 with the following details.

	Pre Test	Post Test
Variable		
Uric Acid Levels (mg/dL)	6,5	6,5
	7,6	6,9
	7,9	7,1
	8,1	7,3
	8,4	7,6
	8,7	8,1
	8,8	7,6
	8,8	7,9
	9,0	8,1
	9,3	8,9
Mean	8.310	7.600

Table 5: *Comparison of uric acid levels in the treatment group (Pre test and post test) on the elderly.*

Source: June 2018 primary data.

Based on table 5, it can be seen that uric acid levels at the time of pretest in the highest treatment group It is 9.3 mg/dL with a mean of 8,310. While uric acid levels Posttests in the highest intervention group were 8.9 mg/dL with a mean of 7,600. Based on this is known that there is a mean difference in the treatment group before and after being treated.

To see a comparison of uric acid levels in the blood in Control group (Pre Test and Post Test) can be seen at table 6 is below.

	Pre Test	Post Test
Variable		
Uric Acid Levels (mg/dL)	3,2	3,9
	3,5	3,8
	3,5	4,1
	3,9	4,5
	4,2	4,8
	4,4	4,8
	4,6	5,3
	4,8	4,8
	5,3	5,9
	5,5	6,1
Mean	4.290	4.800

Table 6: *Comparison of uric acid levels in the control group (Pre test and post test) on the elderly.*
Source: June 2018 primary data.

Based on table 6 above it can be seen that uric acid levels At the time of pretesting in the highest control group was 5.5 mg/dL with a mean of 4,290. As for the level of uric acid posttest In the highest control group was 6.1 mg/dL with a mean of 4,800. Based on this, it can be known that there is a mean difference in the control group, where in this control group has an average increase in uric acid levels.

Bivariate analysis

Bivariate analysis is done to determine the influence of Variables independent (ergonomic gymnastics) with dependent variables (acid levels veins) are addressed with a value of $p < 0.005$. Next to find out whether the research data is normalized on the data of decreased levels Uric acid before and after being given ergonomic gymnastics intervention, then used Shapiro walk test. After conducting a normality test using the Shapiro Walk test showed that not all data is distributed normally. There is one data that is distributed abnormally, namely pretest treatment data, while posttest treatment, pretest control and posttest control are distributed normally. For normal distributed data used Paired T Test, while abnormally distributed data used Wilcoxon Signed Ranks Test.

To see the comparison of uric acid levels pre-test and post in the control group conducted The Paired T Test. The results of the pre-test and posttest uric acid levels comparison test in the control group can be seen in table 7 as follows.

Uric Acid Levels	Pre Test	Post Test	P
Mean	4.290	4.800	.000

Table 7: *Results of the pre test and post uric acid levels comparison test. Test in control group (Paired T test) on the elderly.*
Source: June 2018 primary data.

The results of the Paired T Test obtained a p-value in the control group (pre-posttest) of 0.000 or $p > 0.05$ means that there is no influence of the control group's variable on the decrease in uric acid levels. To see the comparison of uric acid levels pretest and posttest in the intervention group, the Wilcoxon Signed Ranks Test was carried out. The results of the pre-test gout level comparison test and the post test of the intervention group can be seen in table 8 as follows.

Uric Acid Levels	Pre Test	Post Test	P
Mean	8.310	7.600	.007

Table 8: *Results of the pre test and post uric acid levels comparison test. Test t in the intervention group on the elderly. Source: June 2018 primary data.*

The results of the Wilcoxon Signed Ranks Test on pre-test uric acid levels and posttests in the treatment group obtained a p-value of 0.007 or p < 0.005 means that there is a variable influence of the intervention group on the reduction of uric acid levels. To see the influence of independent variables and dependent variables, the Paired T Test is performed. The results of the post test of uric acid levels comparison in the treatment group and posttest in the data control group are seen in table 9 as follows.

Uric Acid Levels	Intervention	Control	P
	Post Test	Post Test	
Mean	7.600	4.800	.000

Table 9: *Results of the pre test and post uric acid levels comparison test. Test in the intervention on the elderly. Source: Data primer June 2018.*

After the Paired T Test, the p-value of the intervention posttest and posttest control of 0.000 or p > 0.05 means that there is no meaningful difference between the treatment group and the control group in the post test.

Discussion

This study was carried out for 8 days during which on the first day observation and pretest of uric acid levels and the introduction of ergonomic gymnastics movement movements to respondents. Furthermore, on the second day to the eighth day given ergonomic gymnastics treatment and on the eighth day a post test of uric acid levels was carried out. Ergonomic exercises are given for 7 days with a frequency of 1 time a day for approximately 20 minutes every morning.

Age

The distribution of respondent frequency based on age level is that some respondents aged between 45 - 50 years, which is as many as 15 years. People or 75% while those aged 56 - 60 years as many as 5 people or 25% based on the results of measuring uric acid levels, each respondent found that the age difference affects uric acid levels in the blood. From the age of uric acid levels due to a decrease in the body system so that they are easily exposed at the age of 45 years and added because of lack of exercise.

Another cause of increased uric acid levels in the blood along with the aging process is caused by decreased kidney function resulting in a decrease in uric acid excretion in the renal tubules in the form of urine. In addition, due to the aging process there is also a decrease in the production of the enzyme Uri kinase which is an enzyme that serves to convert uric acid into a form of tool nine that will be excreted through urine so that uric acid disposal becomes hampered. Gout arises due to the aging process, especially in women who have entered the age of 45 - 59 years because the amount of the hormone estrogen begins to decrease. At this age, gout levels occur more. Gout affects men aged 30 - 40 years. The older the age of men, the higher the frequency of gout (Kertia, 2009).

Gender

The distribution of the frequency of respondents by gender is a portion of female sex respondents, namely as many as 11 people or 55% while men are 9 people or 45%. Uric acid levels in the blood in men are generally higher in line with the increase in age than women whose percentage is smaller. This is because in men and women there is the hormone estrogen where the hormone estrogen plays a role in stimulating the development of follicles that are able to increase the speed of cell proliferation and inhibit the activeness of protein kinase enzymes that have the function of accelerating metabolic activity, including purines metabolism [11].

Education

The distribution of the frequency of respondents based on Education is that some respondents do not finish/elementary school, which are as many as 6 people or 30% while the junior high school is 3 people or 15%. And high school is 11 people or 55% of the data enter that where most are educated high school. Based on these tables, most high school education is aware that gout levels that have education can prevent with behavior. The level of education of the community and uric acid will be a supporting factor for the formation of uric acid prevention behavior. One's knowledge will establish awareness in performing a behavior, especially in uric acid [12].

Work

The frequency distribution of respondents based on work is IRT as many as 11 people or 55% while those who work as Self-employed as many as 8 people or 40% and civil servants 1 person or 5%. Based on the results of measuring uric acid levels is in the blood in each sample showed that the work did not affect the level of uric acid in the blood in the sample.

Uric acid levels

Uric acid levels in pre-test research samples in the control group were known to have the highest value of 4.8 mg/dL and the lowest value of 3.2 mg/dL with an average pre-test uric acid level of 4,290. While the results of measuring posttest uric acid levels in the control group had the highest value of 6.1 mg/dL and the lowest value of 3.8 mg/dL with an average posttest uric acid level of 4,800.

Furthermore, to find out the results of the comparison between the pre-test and posttest in the control group, the Paired T Test was conducted. The results of the Paired T Test for uric acid levels obtained p-value = 0.000 or $p > 0.05$ means that there is no significant influence on the reduction in uric acid levels in the control group. Based on the results of the study, it was found that there was no meaningful influence between pre-test and posttest in the control group. This is because respondents in the control group were not given ergonomic gymnastics interventions or other interventions that could lower uric acid levels.

The uric acid levels of pre-test study respondents in the treatment group are known to have the highest value of 9.3 mg/dL and the lowest value of 6.5 mg/dL with an average pre-test uric acid level of 8,310. While the results of measuring uric acid levels posttest in the treatment group have the highest value of 8.9 mg/dL and the lowest value of 6.5 mg/dL with an average posttest uric acid level of 7,600.

Furthermore, to find out the results of the comparison between pre-test and posttest uric acid levels in the treatment group conducted the Wilcoxon Signed Ranks Test. The results of the Wilcoxon Signed Ranks Test on pre-test uric acid levels and posttests in the treatment group obtained p-value 0.007 or $p < 0.005$ means that there is a significant influence on the treatment group against the decrease in uric acid levels. Furthermore, to find out the results of the comparison test between the treatment group and the control group after being given ergonomic gymnastics for 7 consecutive days (posttest) then the Paired T Test was carried out.

The results of the Paired T Test obtained p-value in the post test treatment and posttest control of 0.000 or p > 0.05 means there is no meaningful difference between the treatment group and the control group in posttest or no influence of the treatment group variables on the control group variables.

The effect of ergonomic gymnastics on lowering uric acid levels

Ergonomic gymnastics is a gymnastics technique for restores or corrects the position and flexibility of the nervous system and blood flow, maximizes oxygen supply to the brain, opens the system of intelligence, sweat, thermoregulation, burning uric acid, cholesterol, blood sugar, lactic acid, oxalate crystals, freshness of the body and immunity. Ergonomic gymnastics is gymnastics whose basic movement consists of five movements that each have different benefits but are interrelated with each other [13].

The results showed that 9 out of 10 respondents in the intervention group experienced a decrease in uric acid levels after being given ergonomic gymnastics interventions for 7 consecutive days. 1 respondent in the treatment group had a fixed result of uric acid levels before and after being given ergonomic gymnastics. This is because respondents do not regulate their diet as long as they are given treatment, namely often consume foods high in purines such as offal and also consume nuts and fried foods every day.

Stated by Sustrani., *et al* (2006) exercise has many benefits for the body and mind, one of which is to prevent and overcome gout. For gout sufferers Nerve relaxation that occurs during exercise can be useful to overcome pain due to gout, improve the condition of strength and flexibility of the joints and minimize the risk of joint damage due to arthritis. Exercise that is done regularly will facilitate blood circulation and overcome blockages in blood vessels. This condition will have a positive effect on the body. Because by exercising the mind will be relaxed so that stress can be reduced and controlled and the metabolic system will run smoothly so that the process of distribution and absorption of nutrients in the body becomes more effective and efficient. A metabolic system that runs smoothly will reduce the risk of accumulating uric acid in the body.

This study supported by Sustrani showed a decrease in uric acid levels that perform ergonomic gymnastics in the elderly who experience gout in the evidence of uric acid levels in banjaraniy village obtained results that of 21 male respondents, 13 people (61.9%) had uric acid levels in the range of 5.6 - 7.3 mg/dL while 31 people respondent women, 14 people (45.2%) had uric acid levels in the range of 3.8 - 5.5 mg/dL of 52 male and female respondent, 41 people (78.85%) had uric acid levels in the normal range with a normal average of 5.47 mg/dL there was an influence on ergonomic gymnastics.

The results showed that ergonomic gymnastics is very effective for lowering uric acid levels. The decrease in uric acid levels is caused because ergonomic gymnastics is a combination of muscle movement and breathing techniques. Breathing techniques performed consciously and using the diaphragm allow the abdomen to lift slowly and the chest to fully expand. The breathing technique is able to provide massage to the heart due to the rise and fall of the diaphragm, opening blockages and facilitate blood flow to the heart and blood flow throughout the body. Thus facilitating the removal of residual is burning such as uric acid by blood plasma from cells to the kidneys and colon to be excreted in the form of urine and feces [13].

The results of the study in accordance with Adiputra who got a higher incidence of gout in men (21.6%) compared to women (8.6%) of the 23 respondents who performed ergonomic exercises there was a decrease in uric acid levels, exercising regularly will be able to stimulate all body systems so as to keep the body in a healthy state. Good exercise is exercise that is done regularly by paying attention to the ability of the body and in accordance with the dose of exercise [14].

Based on the results of the study, it was found that there was no significant difference between the post test of the control group and the post test of the treatment group. This is because, although the uric acid levels of the treatment group decreased but the decrease in

uric acid levels had the same difference in the uric acid levels of the control group that did not change or even increased, the results of measuring uric acid levels would show almost the same results between the control group and the treatment group. Therefore, it was concluded that there was no meaningful difference between the post test of the control group and the post test of the treatment group.

Ergonomic gymnastics is gymnastics and breathing technique to restore or correct the position and flexibility of the nervous system and blood flow. Ergonomic gymnastics also maximizes the supply of oxygen to the brain., opening the intelligence system, sweat system, body heating system, combustion system (uric acid, cholesterol, blood sugar, lactic acid, oxalate crystals), carbohydrate conversion system, electrolyte making system in the blood, body freshness system, and immune system from negative energy/viruses, negative energy disposal system from the body. The movement contained in ergonomic gymnastics is a very effective, efficient and logical movement because the series of movements is a series of prayer movements carried out by humans since long ago until now [15].

This is supported by research conducted by Suharjono., *et al* [16-28] that gymnastics affects the changes in pain caused by gout. Ergonomic gymnastics movements developed will pull the tip of the nerve veins, restore nerve position, put more pressure on the delicate blood vessels in the head, fill/circulate oxygen through the bloodstream to the brain, assess the sweat glands, the body's heating system and other nervous systems.

Ergonomic exercises regularly can improve the condition of strength and flexibility of the joints and minimize the risk of joint damage due to arthritis. This exercise can also provide the effect of warming the body so as to reduce pain and prevent the deposition of uric acid on the cold ends of the body due to lack of blood supply.

Conclusion

Based on the results of the observation sheet that respondents who were given ergonomic gymnastics treatment as many as 10 respondents, 9 respondents experienced a decrease in uric acid levels and 1 respondent had a fixed uric acid level result. While in the control group that was not given an intervention as many as 10 respondents, 1 respondent of whom had a fixed uric acid level and there were 9 respondents who increased uric acid levels. The results of this study can also be used as a source of information and references to conduct further research related to research that researchers have done, especially in the academic field, and for health centers, especially nurses, can make one of the nurses' self-treatment to reduce uric acid levels in patients.

Research Limitation

The limitations during conducting this study are the diet regulation program in control group respondents that have not been done strictly so that the possibility of dietary pattern factors affects the results of the study because based on the results of post-test measurements, especially in control group respondents there are those who experience increased uric acid levels so that all control group respondents are then given an explanation of the procedures and benefits of ergonomic gymnastics in lowering acid levels.

Acknowledgment

Thank you very much to the director and deputy director of the health polytechnic of the Makassar Ministry of Health. Not to forget also to the head of the prepare nursing study program and all lecturers who provide a lot of assistance and cooperation.

Funding

There is no funding in this research

Conflict of Interest

There is no conflict of interest in this research.

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