



ORIGINAL RESEARCH

**EFFECT OF ERGONOMIC GYMNASTIC TO LIPID PROFILE AND BLOOD PRESSURE IN PATIENTS WITH HYPERTENSION AT SUMBER AGUNG VILLAGE JATIREJO DISTRICT MOJOKERTO REGENCY**

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**ABSTRACT**

**Keywords**

Hypertension is the most common disease found in the community. It does not only degrade the quality of life, but it can be life-threatening. Hypertension is known as a heterogeneous group of disease because it can affect anyone from different age groups and various economic classes. There are two therapies for hypertension, i.e., pharmacology and pharmacology. One of non-pharmacology therapy is doing ergonomic gymnastics. The purpose of this research was to see the effect of ergonomic gymnastics to blood pressure on people with hypertension in Sumber Agung Village, Jatirejo Sub-district, Mojokerto Regency.

This research method used one group pre-test - post-test design. Sampling technique used was purposive sampling, with a population of hypertension patient in Sumber Agung Village, Jatirejo Sub-district, Mojokerto Regency and sample number of 20 respondents in the treatment group, and 20 respondents in control group according to criteria. Data collection used ordinal scale and instrument used was observation sheet. analysis using statistical test Paired T-test and Independent T-test SPSS 17 got result p-value 0,00 <0,05

Ergonomic gymnastics was one of effective therapy, easy to do and useful. Because ergonomic gymnastics could make the body relaxed and blood vessels become vasodilated so that the blood flow and oxygen supply becomes smooth.

***Ergonomic  
Gymnastics,  
Blood  
Pressure,  
Lipid Profile,  
Hypertension.***

## BACKGROUND

Hypertension is the most common disease found in the community, and in recent years there has been an increased prevalence of hypertension. Hypertension is known as a heterogeneous group of disease (Indrayani, 2009). The shifting pattern of people's lives that increasingly consume foods containing fat causes the occurrence of atherosclerosis to increase (Ardiansyah, 2012). Lack of physical activity also increases the risk of atherosclerosis.

Hypertension is defined as systolic blood pressure  $\geq 140$  mmHg and diastolic blood pressure  $\geq 90$  mmHg. High blood pressure is associated with an increased risk of stroke, myocardial infarction, heart failure, renal failure. Systolic blood pressure above 115 mmHg is the most important determinant of the risk of death worldwide, responsible for 7.6 million cardiovascular deaths annually. From 1960 to 1991, blood pressure decreased in the United States, and After the first ten years of this interval, the rate of cardiovascular death decreased. However, from 1990 to 2002 blood pressure increased due to a healthy dietary pattern decreased during this period and the prevalence of obesity continued to increase (Sacks & Campos, 2010).

Clients with hypertension should perform physical activities such as exercise and be included as a hypertension management program (Beveers, 2008). One of them is gymnastics / ergonomic exercise. This ergonomic gymnastics can be applied anytime and anywhere. This exercise can help reduce the symptoms of hypertension, such as a headache, the strain of the eyes, neck, back and waist, shoulders, and pain in the wrist. One of the goals of ergonomic exercise is the

achievement of "pain-free movement" through the liberation of nerve irritation and improvement of nerve flexibility, preventing static loading, normalization of nerve microcirculation, postural correction, joint mobilization, soft tissue. Also, ergonomic exercise can increase oxygen supply throughout the body so that blood pressure can be controlled (Madyo W., 2010).

Prevalence of hypertension according to WHO (2011), it is estimated that 40% of developing countries have hypertensive patients, while in developed countries 35% and Southeast Asia estimated 36% of the population suffers from hypertension (Widiyani, 2013). Results of Household Health Survey (SKRT), 26.4% and 27.5% in 2001 and 2004. Furthermore, it is estimated to increase again to 37% by 2015 and 42% by 2025. Basic Health Research Results (Risksedas) 2007 performed in Indonesia showed that the highest proportion of deaths were non-communicable diseases, i.e., cardiovascular disease (31.9%) including hypertension (6.8%) and stroke (15.4%). Data from East Java 2011 health office showed 287,724 patients suffered hypertension of 37,687,622 residents of East Java.

While the year 2012 data DHO kab. Mojokerto total hypertension 34,529 patients from 1,123,239 inhabitants of Mojokerto, while the highest number of hypertension events in 2014 is 1494 patients, in Jatirejo sub-district, Mojokerto district. This is the main challenge of future health problems where the prevalence of hypertension in Indonesia has increased from year to year.

According to research conducted by Wati, Fajriyah and Atabaki (2013) on the effectiveness of healthy heart gymnastics and ergonomic gymnastics on blood pressure drop in hypertensive elderly in Tangkil Kulon village, Kedungwuni sub-district of Pekalongan district, showed that with 20 samples there is a difference in effectiveness between healthy heart gymnastics with ergonomic gymnastics to decrease systolic and diastolic blood pressure in elderly hypertension. The mean value of systolic blood pressure reduction with ergonomic gymnastics of 8.73 mmHg and heart-healthy gymnast is 23.60 mmHg, and the mean value of diastolic blood pressure drop with ergonomic gymnast is 4,80 mmHg, and heart-healthy gymnast is 13,66 mmHg.

Meanwhile, based on the preliminary study on April 6, 2017, in Sumber Agung village which is the working area of UPT Puskesmas Jatirejo. Obtained data, hypertension patients who do pharmacology treatment as much as 41 patients during January with total visits 369 and in February as much as 33 patients total visit 307 patients. Patients always do pharmacological treatment, but sometimes patients visit if only have complaints and treatment is not done continuously and continues, other than that the patient who came is not aware of ergonomic gymnastics methods.

Many healing efforts either pharmacological or non-pharmacological therapy. Pharmacological treatments, for example, use drugs such as thiazide diuretics, beta blockers, calcium channel inhibitors, ACE inhibitors, alpha blockers, centrally acting drugs, angiotensin receptor antagonists. While non-pharmacological treatments such as, changing

diet and lifestyle, limit the consumption of salt, weight control, not consuming alcohol, stress counseling, potassium supplements, and perform regular exercise. Choosing sports such as leisurely walks, swimming, treadmills, light exercises that can make a little sweat and do not exert a weary effect on the body but the application remains optimal (Beever, 2002). In addition to exercise the Mediterranean diet or dietary diets of the DASH model is very well associated with the MHO model diet and the MONW phenotype, it is proved that potential dietary interventions prevent cardiometabolic disease in several different age groups (Park et al., 2016).

Madyo Wratsongko MM, ergonomic gymnastics creator, from Indonesian Ergonomic Gym and Health Care, this gymnastics is useful to prevent and cure various diseases. To obtain satisfactory results, it would be better if the exercises are done continuously, at least 2-3 times a week  $\pm$  20 minutes if all movements are done perfectly. The benefits obtained by doing ergonomic exercises such as movement, activate the function of organs, generate biolistrik in the body and launch enough oxygen circulation in the body so that the body will feel fresh and energy increases, healing various diseases that attack the spine, help cure sinusitis and asthma, increase endurance, control high blood pressure, increase bone elasticity, help cure migraine disease, vertigo, dizziness, nausea, help overcome bowel problems, strengthen waist muscles, kidneys, etc. (Sagiran, 2012) . Based on the description above obtained the formulation of the problem is "Is there an influence of ergonomic gymnastics to blood pressure and lipid profile in patients with

hypertension in Sumber Agung Village Kec. Jatirejo Kab. Mojokerto? "

## RESEARCH PURPOSE

### A. General Purpose

Identify the influence of ergonomic gymnastics on blood pressure and lipid profile in hypertensive patients.

### B. Specific Purpose

1. To Identify blood pressure before and after ergonomic gymnastics in hypertensive patients in Sumber Agung Village Jatirejo District.
2. To Identify lipid profiles before and after ergonomic exercise in hypertensive patients in Sumber Agung Village Jatirejo District.
3. To analyze the difference of ergonomic gymnastics effect on blood pressure in treatment group and control group of hypertension patient in Sumber Agung Village, Jatirejo District.
4. To analyze the difference of ergonomic gymnastics effect on the lipid profile in the treatment group and control group of hypertension patients in Sumber Agung Village, Jatirejo District.

## RESEARCH METHOD

The research design used was pre-post experimental design, said pre-experimental design. In this study the population of all hypertensive patients in the village of Sumber Agung Jatirejo District Mojokerto regency as many as 40 respondents.

Analysis using statistical test Paired T-test and Independent T-test.

## RESULTS

**Table 1**  
**Distribution of Respondents Based on Age, Sex, Smoking, Genetic, Hypertension Drug Consumption, Diet High Salt In Sumber Agung Village Kec. Jatirejo Kab. Mojokerto Year 2017 (n = 40)**

No	Variabel	Frekuensi (%)		
		Kelompok		
		Kontrol	Perlakuan	
1	<u>Usia</u>	Dewasa Awal (26-35 tahun)	4 (20)	1 (5)
		Dewasa Akhir (36-45 tahun)	7 (35)	8 (40)
		Lansia Awal (46-55 tahun)	9 (45)	11 (55)
2	<u>Jenis Kelamin</u>	Laki-Laki	17 (85)	15 (75)
		Perempuan	3 (15)	5 (25)
3	<u>Kebiasaan Merokok</u>	Ya	16 (80)	14 (70)
		Tidak	4 (20)	6 (30)
4	<u>Genetik</u>	Ya	14 (70)	16 (80)
		Tidak	6 (30)	4 (20)
5	<u>Konsumsi Obat</u>	Ya	12 (60)	8 (40)
		Tidak	8 (40)	12 (60)
6	<u>Diet Tinggi Garam</u>	Ya	8 (40)	12 (60)
		Tidak	12 (60)	8 (40)

Based on table 1 respondents by age in the treatment group most of the respondents based on the age of the elderly group of 11 respondents (55%). While in the control group most of the respondents based on the age of the early elderly group as many as nine respondents (45%). Respondents by sex in the treatment group were mostly male respondents were 15 respondents (75%). While in the control group most of the respondents were male as 17 respondents (85%). Respondents based on smoking habit in the treatment group most of the respondents had the habit of smoking as much as 14 respondents (70%). While in the control group most have a smoking habit as much as 16 respondents (80%). Respondents based on genetic factors in treatment group most of the respondents had a history of 16 respondents (80%). While in the control group most of the respondents have a history of descent that is as many as 14 respondents (70%). Respondents based on high salt diet habits in treatment group most of the respondents did not diet high salt as much as 12 respondents (60%). While in the control

group most respondents high salt diet 12 respondents (60%).

**Table 2**  
Analysis of changes in blood pressure before and after doing ergonomic exercise in people with hypertension

NO. Res	KELOMPOK PERLAKUAN						KELOMPOK KONTROL						
	TD SEBELUM (mmHg)		TD SESUDAH (mmHg)		SELISIH		NO. Res	TD SEBELUM (mmHg)		TD SESUDAH (mmHg)		SELISIH	
	S	D	S	D	S	D		S	D	S	D	S	D
1	140	90	110	70	30	20	1	140	90	138	80	2	10
2	160	90	120	80	40	10	2	140	90	135	85	5	5
3	167	107	120	80	47	27	3	140	90	135	85	5	5
4	166	90	140	70	26	20	4	170	90	170	90	0	0
5	175	103	140	80	35	23	5	170	130	170	130	0	0
6	176	108	130	80	46	28	6	150	90	145	90	5	0
7	160	100	133	78	27	22	7	153	97	143	90	10	7
8	178	101	140	80	38	21	8	150	100	150	100	0	0
9	179	108	144	80	35	28	9	150	90	150	90	0	0
10	175	90	142	70	33	20	10	167	107	167	107	0	0
11	150	90	125	80	25	10	11	166	90	166	90	0	0
12	153	97	120	80	33	17	12	178	103	160	98	18	5
13	150	100	120	80	30	20	13	150	100	150	100	0	0
14	150	90	114	80	36	10	14	175	120	170	110	5	10
15	170	90	110	70	60	20	15	175	90	170	85	5	5
16	150	86	130	75	20	11	16	150	90	150	90	0	0
17	150	86	120	70	30	16	17	153	97	153	97	0	0
18	176	109	140	80	36	29	18	150	86	150	86	0	0
19	176	109	150	80	26	29	19	150	86	150	86	0	0
20	140	90	120	80	20	10	20	176	120	170	110	6	10
Median	150	90	120	80	30	20	Median	160	90	160	90	0	0
Median	163	93.5	127.5	80	33	20	Median	161.5	90	160	90	0	0
Mean	162.1	96.7	128.4	77.15	33.65	19.55	Mean	167.7	97.8	164.6	94.95	3.05	2.85

Based on Table 2 it is known that in the treatment group at the highest pre-test is the value of Systole 179 mmHg and Diastole value is 109 mmHg. At the highest post-test, the Systole value is 150 mmHg, and Diastole value is 80 mmHg. In the treatment group, most of the respondents experienced a decrease in blood pressure, the mean decrease was Mean Systole 33.65 mmHg and Mean Diastole 19.55 mmHg.

In the control group at the highest pre-test was Systole 176 and diastole 130 mmHg. At the time of the highest post-test is the value of 170 mmHg Systole and Diastole value is 130 mmHg. In the control group most of the respondents did not experience a drop in blood pressure, only four respondents who experienced a decrease in blood pressure, mean decrease was Mean Systole 3.05 and Mean Diastole 2.85. Based on this it can be seen that there is a meaningful difference in the control group, which in this control group has lower mean blood pressure than the treatment group.

**Table 3**  
Analysis of lipid profile changes before and after doing ergonomic exercises in people with hypertension

NO. Res	KELOMPOK PERLAKUAN			KELOMPOK PERLAKUAN			
	PROFIL LIPID (mg/dl)			PROFIL LIPID (mg/dl)			
	SEBELUM	SESUDAH	SELISIH	SEBELUM	SESUDAH	SELISIH	
1	314	239	75	1	224	220	4
2	285	213	72	2	172	160	12
3	251	200	51	3	251	251	0
4	275	215	60	4	115	110	5
5	212	200	12	5	287	287	0
6	223	200	23	6	236	236	0
7	235	200	35	7	236	236	0
8	283	210	73	8	181	179	2
9	223	200	23	9	224	224	0
10	212	200	12	10	251	251	0
11	236	200	36	11	275	275	0
12	236	205	31	12	212	212	0
13	181	170	11	13	181	170	11
14	224	200	24	14	223	223	0
15	234	200	34	15	212	212	0
16	236	200	36	16	236	236	0
17	142	120	22	17	236	236	0
18	115	110	5	18	236	236	0
19	205	198	7	19	142	142	0
20	223	200	23	20	115	115	0
Median	223	200	23	Median	236	236	0
Median	229	200	27.5	Median	224	223.5	0
Mean	227.25	194	33.25	Mean	212.25	210.55	1.7

Based on table 3 it is known that in the treatment group at the time of the highest pre-test was 314 mg/dl. At the time of the highest post-test is 239 mg/dl. In the treatment group, most of the respondents had decreased lipid profile; the mean decrease was Mean 33.25 mg/dl.

In the control group at the time of the highest pre-test was 287 mg/dl. At the time of the highest post-test is 287 mg/dl. In the control group, the majority of respondents did not experience a decrease in lipid profile, only five respondents had decreased lipid profile, the mean decrease was Mean 1.7 mg/dl. Based on the results of different test data analysis using Paired T-test with SPSS 17 obtained results p-value 0.00 <0.05 which means H0 rejected, so there is ergonomic gym effect on lipid profile of hypertension patients.



**Table 4**  
**Analysis of changes in blood pressure before and after doing ergonomic exercise in the treatment group and control group of hypertension patients...**

Levene's Test for Equality of Variances		Independent Samples Test								
		t-test for Equality of Means								
		95% Confidence Interval of the Difference								
	F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper	
Nilai	Equal variances assumed	5.176	.029	12.860	38	.000	30.60000	2.37946	25.78303	35.41697
	Equal variances not assumed			12.860	27.315	.000	30.60000	2.37946	25.72038	35.47962

Based on table 4 it is known that the results of different test data analysis using Independent T-test with SPSS 17 obtained results p-value 0.00 <0.05 which means H0 rejected, so there is an ergonomic gym effect on blood pressure in patients with hypertension.

**Table 5**  
**Analysis of lipid profile changes before and after performing ergonomic exercise in the treatment group and control group of hypertension**

Levene's Test for Equality of Variances		Independent Samples Test								
		t-test for Equality of Means								
		95% Confidence Interval of the Difference								
	F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper	
lipid	Equal variances assumed	23.914	.000	6.295	38	.000	31.55000	5.01155	21.40464	41.69536
	Equal variances not assumed			6.295	20.031	.000	31.55000	5.01155	21.09711	42.00289

Based on Table 5.9 it is known that the results of different test data analysis using Independent T-test with SPSS 17 obtained results p-value 0.00 <0.05 which means H0 rejected, so there is ergonomic gymnastics effect on lipid profile of hypertensive patients.

## DISCUSSION

### 1. Analysis of changes in blood pressure before and after doing ergonomic exercise in people with hypertension

Based on Table 2 it is known that blood pressure in the treatment group before given ergonomic gymnastics intervention, most respondents have Blood Pressure mean value with systole 162,1 mmHg and diastole 96,7 mmHg. While in the control group before ergonomic gymnastics intervention, most respondents had mean Blood Pressure value with 157.7 mmHg systole and 97.8 mmHg diastole. Hypertension is not only caused by a single factor, but a variety of factors can be the originator of the occurrence of hypertension such as disease complications, lifestyle, descent as described earlier. The data obtained by each respondent vary due to factors affecting blood pressure and the cause of hypertension among individuals of different factors. This ensures a more accurate interpretation of blood pressure measurements (Marliani, 2007).

The first factor that can affect the incidence of hypertension is age. The normal value of blood pressure varies throughout life and will continue to vary from one beat to another. The normal standard for teens and adults is 120/80 mmHg. The incidence of hypertension increases at age 35 and above. This is because the arteries are harder and less flexible to the blood. This increases systolic pressure. Diastolic pressure also increases as blood vessel walls are no longer flexibly retracted at a decrease in blood pressure.

The second factor is gender; clinically there is no significant difference between men and women. However, after menopause women tend to have high blood pressure than men (Perry & Potter, 2005). Men in the general population have the highest diastolic rate in their blood pressure compared to women.

Although men have the highest incidence hypertension in men and women can cause stroke, left ventricular enlargement, and kidney dysfunction. The reason for the difference in blood pressure by sex is unknown but is being investigated by several laboratories. Estrogen has been believed but has not been proven to lower blood pressure in young women. From the blood pressure fluctuation data during life brings support to the hypothesis. However, the incidence is related to changes in blood pressure from all life to the smallest level of endogenous cells.

The third factor is heredity, based on the results of the study as many as 13 respondents (65%), have a history of hypertension, genetically hypertensive disease has a significant relationship with the genes trigger hypertension contained in the human chromosome. Although hypertension genes have not been accurately identified genetic factors in humans may affect the renin-angiotensin-aldosterone system (Ridwan M., 2009). This states that if the parents experience hypertension, then the child is likely to have hypertension due to genetic traits inherited to offspring.

The fourth factor was smokers, some respondents in the treatment group or control group had a smoking habit. As many as 14 respondents (70%) in the treatment group and as many as 16 respondents (80%) in the control group. This suggests that nicotine in your tobacco is the cause of increased blood pressure soon after the first suction. Like other chemicals, in nicotine cigarette smoke will be absorbed by the tiny blood vessels in the lungs, then circulated throughout the body through the bloodstream. Within seconds the nicotine

has reached the brain. The brain will react to nicotine into the brain by signaling the adrenal gland to release epinephrine (adrenaline). This powerful hormone will react to constrict the blood vessels, as the blood vessels of the brain narrow it will force the heart to work heavier because of higher pressure. If the pumping of the heart is strong enough, and the narrowing of blood vessels in the brain due to epinephrine reactions is also quite strong, it will happen blood vessels of the brain to break; this will cause stroke. Smoking will harm the blood vessel walls and accelerate the formation of atherosclerosis (hardening of the arteries). So, although it does not increase blood pressure directly, smoking is the very bad effect on everyone especially those who already have high blood disease (hypertension). From various studies that have been done, smoking behavior is known to give the impact of the metabolic shift in the form of growth hormone release and add fatty acid, glycerol and lactate, resulting in decreased HDL (high density lipid) cholesterol, increase LDL (low-density lipid) cholesterol and triglyceride, also acts as a trigger for increased insulin resistance as well as hypersulinemia which further leads to heart defects, blood vessels, and hypertension and increases the risk of coronary heart disease or cardiac death (Sani, 1994, in sianturi, 2004).

The next factor is high salt diets, Excess salt intake can increase arterial vascular constriction, so this can increase blood pressure. Salt consumption is allowed if less than 5 grams, about one teaspoon (Beever, 2005). If you consume more than 5.8 grams of salt per day, this can increase your blood pressure. If we can reduce 1.8 grams per day alone, it can lower systolic blood pressure by 4

mmHg and diastolic 2mmHg (Ridwan M., 2009). Consumption of excessive salt and takes place daily will have a direct impact on the body because what we consume must be processed by the digestive system is absorbed and flowed throughout the body by blood vessels. If high salt levels in the body will result in narrowing of blood vessels and this is what makes the workload of jantung will increase and there is high blood pressure or hypertension. The association between the Dietary Approach to stop hypertension (DASH) -the diet diet and the development of metabolic syndrome (MetS) in 424 children and adolescents. CI OR and 95% developed MetS at the highest, compared with the lowest, quartile DASH score was 0.36 (0.14-0.94). (Larsson, Wallin, & Wolk, 2016)

After the treatment was given, all respondents in the treatment group experienced a decrease in blood pressure. Based on the results of the study and presented in Table 5.6 it can be seen that after intervention the mean value is 128.4 / 77.15 mmHg, while the median value is 127.5 / 80 mmHg, and the mode value is 120/80 mmHg. Based on existing theory there are various factors that influence blood pressure, as described above? And measures to lower blood pressure are pharmacology and nonpharmacology. One of these non-pharmacological treatments is to exercise like ergonomic exercise. This ergonomic gymnastics can smooth the blood circulation, oxygen supply throughout the body and can achieve maximum relaxation so that it can affect blood pressure (Madyo W., 2010). This ergonomic gymnastics consists of 5 basic movements namely chest movement, submissive gratitude, sitting mighty, and sitting burning and lying down resigned. Each

movement contains tremendous benefits in maintaining fitness, can launch blood flow because all the blood vessels will experience vasodilatation. Therefore after doing ergonomic gymnastics appropriately and done routinely every respondent will have good body resistance and prime hence can influence blood pressure. Not only quality and quantity in doing ergonomic gymnastics, after given treatment, need to improve healthy lifestyle in order to keep control of his blood pressure, from which blood pressure can decrease.

From the above discussion, based on the characteristics of sex, hereditary history, and salt intake strongly support the occurrence of hypertension, to change the lifestyle to be more qualified as consuming the food we need will be better than consuming the food we want. This is done so that we can control blood pressure and no further complications occur. This is in accordance with the research of Prime, RM (2014) about the effectiveness of ergonomic gymnastics with low impact aerobic gymnastics on blood pressure level in elderly hypertension that is the result of research indicate there is a difference of influence of ergonomic gymnastics and low impact aerobic to blood pressure level of sistole and diastole at elderly hypertension , and the most effective effect is ergonomic gymnastics on the pressure of systole and low impact aerobic gymnastics on diastole pressure. It is recommended for elderly to be more active to follow ergonomic gymnastics or low impact aerobic so that blood pressure can be stable.



## **2. Analysis of lipid profile change before and after doing ergonomic gymnastic on hypertension patient in Sumber Agung village Jatirejo sub-district Mojokerto regency**

Based on Table 5 it is known that lipid profiles in the treatment group before being given ergonomic gymnastics interventions, most of the respondents have a mean value of 227.25 mg / dl. The mode value is 223 mg / dl. Median value 229 mg / dl. In the control group, most respondents had mean values of 212.25 mg / dl. The mode value is 236 mg / dl. Median value 224 mg / dl.

Based on Table 5 it is known that lipid profiles in the treatment group after ergonomic gymnastics interventions given, most respondents have mean value 194 mg / dl. The mode value is 200 mg / dl. Median value 200 mg / dl. With an average difference of 33.25 mg / dl. In the control group, most respondents had mean values of 210.55 mg / dl. The mode value is 236 mg / dl. The median value was 223.5 mg / dl. With an average difference of 1.7 mg / dl.

Many factors that can cause research results one of them is the lifestyle of research samples that can not be controlled by researchers, including daily physical activity and eating patterns of the sample. Increased levels of HDL cholesterol are directly proportional to the intensity and frequency of exercise in a matter of weeks. elevated levels of HDL cholesterol and regular physical exercise In contrast to previous research conducted by Rattu and Rampengan in Manado, HDL cholesterol levels increased significantly after exercise. This study maintains a diet low in saturated fat during exercise. Solid saturated

intake affects the blood lipid profile that plays a role in the decline in HDL cholesterol levels. Exercise accompanied by dietary changes has been shown to improve the profile of lipoproteins, including HDL cholesterol.

Age factor of the respondent itself where total cholesterol in elderly is higher than cholesterol at a young age. According to research conducted by Faisal baraa (1999) and Listiana, Purbosari (2006) explained that at an aging age, total cholesterol is higher levels. This suggests that age can affect a person's total cholesterol level. Older age total cholesterol is relatively higher than total cholesterol at a young age; this is because the older an individual LDL receptor activity may be less. These receptor cells act as cholesterol circulatory hemostasis in the blood and are present in the liver, gonadal glands and adrenal glands. If this receptor cell is disturbed, then the cholesterol will increase in the blood circulation. In addition, in the elderly are often found abnormalities of narrowing of the blood vessels of the heart, this is closely related to changes that occur in the walls of blood vessels, such as arteries that are likely to shrink gradually over long periods. The amount of fat that exists in old age is more likely to drain than young age. At an older age, physical activity tends to decrease or lack of exercise, whereas to maintain normal cholesterol levels in women requires at least 1500-1700 calories of fat burned a day, while in men it takes up to 2000-2500 calories of fat burned a day. With physical activity and less exercise possible in old age, cholesterol is not able to experience the process of metabolism and combustion is perfect, in this case, the cholesterol that is accumulating in the blood vessels. The amount of fat in young adult men generally ranges

from 15-20% of total body weight and 20-25% in women. Usually, the amount of fat in the body tends to increase with increasing age.

Other factors that support no effect of this elderly gymnastics are possible lifestyle by the subjects among other foods that are consumed by subjects that can not be controlled by researchers and subjects daily activities. Other habits such as smoking accompanied by drinking coffee, this habit is also made by the subject of research. This habit is very common in men who get older even though it started since youth but the effects of all that new look at the increasingly twilight age. Cigarettes can lower levels of HDL cholesterol around 4.5-6% as a result of higher LDL cholesterol levels, and this affects the total cholesterol levels are relatively higher too. In women who enter menopause, cholesterol levels in the blood tend to increase this is because the hormone estrogen is not formed. This estrogen hormone is thought to have a protective effect on atherosclerosis that can bind cholesterol in the blood. Uncontrolled diets are also another contributing factor; this is because at an aging age the food they consume is poorly maintained, so it is possible that the cholesterol present in the food has a very high level.

### **3. Analysis of changes in blood pressure before and after doing ergonomic gymnastics in the treatment group and control group of people with Hypertension in Sumber Agung Village, Jatirejo Sub-district, Mojokerto Regency**

Based on the statistical test showed that in the treatment group more showed a decrease in blood pressure than the treatment group. It is proved by the result of Independent T-test with

SPSS 17 got result p-value 0,00 <0,05 for systolic blood pressure and diastolic, meaning there is a significant difference to systolic and diastolic blood pressure change in hypertension patient. Thus it can be concluded that ergonomic gymnastics is effective in lowering blood pressure for the elderly. It is recommended that ergonomic gymnastics is applied as an alternative to lowering hypertensive elderly blood pressure and can be one of the nursing orders. In accordance with previous research by Novia Putri Ningsih 2015 on "Influence of Ergonomic Gymnastics Against Blood Pressure of Elderly Hypertension at Elderly Posyandu Father-Mother of Andalas Puskesmas Working Area" stated that ergonomic gymnastics effective in lowering blood pressure for elderly.

While in the control group, did not show significant changes in blood pressure decrease. This is influenced factor because in the process of collecting data control group is not given assistance in the implementation of ergonomic gymnastics. So it can not be ascertained whether the control group performed all stages of SOP in ergonomic gymnastics. Because researchers only provide ergonomic gymnastics explanations and mentoring only once in the research process.

### **4. Analysis of lipid profile change before and after doing ergonomic gymnastics on treatment group and control group of hypertension patient in Sumber Agung Village Jatirejo Sub-District Mojokerto Regency**

Based on statistical test showed that in the treatment group more showed a decrease in lipid profile compared with treatment group. This is evidenced by the results of Independent

T-test with SPSS 17 obtained results p-value  $0.00 < 0.05$  which means there is a significant difference in lipid profile changes in patients with hypertension.

While in the control group, did not show significant changes in the decrease in lipid profile. This is influenced factor because in the process of collecting data control group is not given assistance in the implementation of ergonomic gymnastics. So it can not be ascertained whether the control group performed all stages of SOP in ergonomic gymnastics. Because researchers only provide ergonomic gymnastics explanations and mentoring only once in the research process.

## CONCLUSION

Most of the treatment group respondents experienced a decrease in blood pressure, while in the control group most did not experience a drop in blood pressure. Most of the treatment group respondents experienced a decrease in lipid profile, while in the control group most did not experience a decrease in lipid profile.

## SUGGESTION

1. Respondents are expected to be more often and regularly doing ergonomic gymnastics because ergonomic gymnastics has beneficial effects on the body by improving blood circulation. Ergonomic gymnastics easy to do and does not cause negative impacts to the body than it is expected also hypertensive patients try to use other non-pharmacological therapy that can lower blood pressure.
2. Health workers are expected to make ergonomic gymnastics as an alternative independent nursing action that can be used by nurses or other health workers,

especially to lower blood pressure in people with hypertension.

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