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Original Research Article

The Role of Aerobic Gystern in Controlling Blood Pressure for Hypertension Patients

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ABSTRACT

Introduction. One of the good physical activities to improve physical fitness is aerobic exercise. Someone who does not have the habit of aerobic exercise have 30-50% tendency in hypertension. Regular aerobic exercise can lower the blood pressure effectively. Physical activity with aerobic exercise is recommended for 30 minutes/day with 3 days/week. This research aimed to determine correlation between aerobic exercise habits and blood pressure in hypertension patients. **Methods**. This research was descriptive correlative with cross sectional approach. The population was 120 respondents and a sample of 60 respondents at Karangperanti, using purposive sampling technique and data collection using non-standard questionnaires through bivariate data analysis with Pearson Correlation. **Results & Analysis**. The habit of regular aerobic exercise activities were 32 respondents (52.8%) and irregular activity were 28 respondents (47.2%). The frequency based on respondent's blood pressure showed that SBP had a median value of 150 mmHg, a minimum value of 140 mmHg and a maximum value of 185 mmHg with an average value of 152.55 mmHg and a standard deviation of 11.814 mmHg. Meanwhile, DBP has a median value of 92 mmHg, a minimum value of 90 mmHg and a maximum value of 120 mmHg with a standard deviation of 5.155 mmHg. There is a correlation between aerobic exercise habits and blood pressure in hypertension patient at Karangperanti Village with p value 0.000 ($\alpha = 0.05$). **Discussion**. It is expected that people with hypertension always do aerobic exercise with 3 times with a duration of 30 minutes per week.

Keywords: Aerobic Exercise, Blood Pressure, Hypertension Patients.

INTRODUCTION

Cardiovascular disease are causes about 16 million deaths per year. Hypertension is responsible for at least 48% of deaths due to heart disease (WHO, 2013). The prevalence of hypertension in Indonesia at the age of 18 years showed an increase in 2013 from 28.8%, to 34.1% in 2018. The hypertension data according to Riskesdas (2018) for productive age in 18-24 years old as many as 13.2%, 28-34 years old as much as 20.1%, age 35-44 years old as much as 3.6%, and the age of 45-55 years old as many as 45.3%. In Central Java, the hypertension sufferers in 2013 increased from 28.8% to 35.1% in 2018. According to Semarang health profile in 2014, the results of blood pressure

measurements obtained from Posbindu was 23.66%. the blood pressure measurements were mostly conducted on women (2.81%), since most of those who came to Posbindu were women. According to Ministry of Health (2018) the cases of hypertension are more common in men with 14.69%, while the hypertension cases in women are 8.99%.

The factors that caused hypertension are age, gender, smoking and alcohol habits, , the consumption of caffeinated beverages >1 time per day, lack of physical activity and obesity (Sumartini, Zulkifli and Adhitya, 2019). The physical activity is very influential on a person's physical fitness level. One of the good physical activities to improve physical fitness is aerobic. A person who does not have the aerobic habit has a 30-50% tendency to suffer the hypertension (RI, 2019).

A small decrease in blood pressure has been shown to reduce the risk of cardiovascular disease and stroke. A decrease in blood pressure of 2 mmHg will reduce the risk of cardiovascular disease and stroke by 4% and 6% (Mustafa et al, 2013). Based on a preliminary survey conducted in Karangperanti Village, it was found that many people did not do aerobic exercise. From 15 people, there were 9 people (60%) who did not aerobic exercise had a blood pressure of 140/90mmHg – 170/90 mmHg and 6 people (40%) who did aerobic exercise with an average blood pressure of 120/90mmHg to 130/90 mmHg.

Based on the background related to the importance of aerobic exercise habits on blood pressure for hypertensive patients, the researchers are interested in conducting a research with the title "The correlation of aerobic exercise habits with blood pressure for hypertensive patients at Karangperanti village"

METHOD AND ANALYSIS

This type of descriptive correlational research with a cross sectional approach with the use of incidental sampling technique. This research was conducted on 14-20th of July 2019. The population of this research was 120 people with hypertension and the number of samples was 60 respondents using purposive sampling technique.

RESULTS

A. Univariate Analysis

1. Aerobics Activity

Based on table 1, it can be seen that the 32 respondents are likely to do aerobic exercise regularly.

Table 1. The Frequency distribution based on aerobic exercise

Activity	f	%
Aerobics		
Irregular	28	47.2
Regular	32	52.8
Total	60	100.0

2. The overview of blood pressure

Table 2. Frequency distribution of respondent's blood pressure (n=60)

Blood pressure	**Median (min-max)**	**Mean**	**SD**
Systolic	150 (140-185)	151.55	11.814
Diastolic	92 (90-120)	95.11	6.182

Based on table 2, the minimum value of SBP is 140 mmHg and a maximum value is 185 mmHg. Meanwhile, DBP has a minimum value of 90 mmHg and a maximum value of 120 mmHg.

B. Bivariate Analysis

1. The correlation of aerobic habits with blood pressure in hypertension patients at Karangperanti Village.

Table 3. The correlation of aerobic habits with blood pressure in hypertension patients at Karangperanti Village

Blood pressure	**Aerobics Activity**				
	n	**mean**	**SD**	**r**	**p**
Systolic	60	151.55	11.814	-0.631	0.000
Diastolic		95.11	6.182	-0.594	

Based on table 3 above, there is a correlation between aerobic exercise and blood pressure in hypertension patients.

DISCUSSION

1. Aerobic Gymnastics Activities in Hypertensive Patients at Karangperanti Village

Based on table 1, it can be seen that the respondents distribution based on aerobic activities, that the most regular respondents as many as 46 people (58.2%). This is supported by the existence of aerobic activities conducted by respondents with the category of 100% regular in doing aerobic exercise activities at least 3 times a week with a minimum duration of 30 minutes in accordance with the statements listed in points 3b and 4b. These results are in line with research conducted by Lampung, D. K. P. (2017) which states that 60.3% have good and/regular aerobic exercise activities.

The regular aerobic exercise can improve the physical and mental health. The aerobic exercise does not need heavy aerobic exercise, just light aerobic exercise such as brisk walking, jogging, cycling, or swimming. The aerobic gymnastics is a form of planned and structured physical activity which involves repetitive body movements that

aimed to improve the physical fitness, and the body's metabolism will improve physically and mentally (Dalam, 2019).

Based on the research, all respondents who have regular aerobic exercise do their exercise with a frequency of 3 times and 30 minutes duration per week. The correct, measurable, and regular physical exercise will improve physical fitness that is important for maintaining the body stamina. Active physical activity by doing exercise for at least 10 minutes until the pulse and breathing are increase faster than usual. Diaz (2013) defines regular exercise as body movement resulting from contraction of skeletal muscles that increases energy, pulse and breathing which is conducted for at least 20 minutes, 3-5 times a week to enhances the cardiorespiratory endurance. Based on the research result, most of 30 respondents (56.6%) did walking aerobics that can reduce mortality by 14% in coronary heart cases. The effect of walking is directly correlated with the speed development of muscle glucose recovery and increasing the production of NO (Nitrit Oxide) plasma.

If NO levels increase, the prophylactic role of atherosclerosis will run optimally and will improve the constriction due to atherosclerosis (Pesawaran, 2019) that can increase the blood vessel dilatation and lower blood pressure. In the case of stroke, regular aerobic exercise can reduce blood pressure in people with hypertension, increase the levels of high-density lipoprotein (HDL) and lower levels of low-density lipoprotein (LDL) thereby minimize the risk of stroke. The habit of aerobic exercise that starting at an early age will help good bone growth that can reduce the risk of osteoporosis in future. This data also states that people who do not like aerobic exercise are more likely to develop the colon cancer 3 times than people who do aerobic exercise regularly (Karim, 2018).

2. The overview of blood pressure hypertension patient at Karangperanti Village

Based on table 2, it can be seen that SBP has a median value of 150 mmHg, a minimum value of 140 mmHg and a maximum value of 185 mmHg with an average value of 152.55 mmHg and a standard deviation of 11.814 mmHg. Meanwhile, DBP has a median value of 92 mmHg, a minimum value of 90 mmHg and a maximum value of 120 mmHg with an average value of 95.11 mmHg and a standard deviation of 5.155 mmHg.

These results are in line with research conducted by Khalifah (2017), which showed that SBP (median 150,

minimum value 140 and maximum value 170 with a standard deviation of 9.376) DBP (median 96.11, minimum value 90 and maximum value 100 with a standard deviation of 5.016). Based on the table, all respondents had hypertension with the lowest value of SBP/DBP 140/90 mmHg.

Hypertension is an increase in systolic and diastolic blood pressure above 140/90 mmHg consistently (Jaka S, 2016). High blood pressure is the initial result of an increase in cardiac output which maintained at a higher level as a reciprocal increase in peripheral resistance (Harahap, 2018).

The results of patients' physical examination with hypertension did not find any abnormalities other than high blood pressure accompanied by headache, stiff neck, fatigue and palpitations.

Based on research result, it was found that most of respondents were female with 35 respondents (66%). The gender is very closely related to the occurrence of hypertension that is higher in women when they experience a menopause. Women who have not experienced menopause are protected by hormone estrogen which plays a role in increasing the High Density Lipoprotein (HDL) level. High levels of HDL cholesterol is a protective factor in preventing the atherosclerosis process. The protective effect of estrogen is considered as an explanation for the female immunity presence in premenopausal age (Basuki, 2021).

This is in accordance with the opinion of Febby (2013), which states that there is a significant correlation between gender and hypertension. This shows that the hypertension in women is influenced by the hormone estrogen levels. The estrogen hormone will decrease when women experience the old age (menopause) that they become more susceptible to hypertension.

3. The correlation of aerobic exercise habits with blood pressure in hypertension patients at Karangperanti Village.

Based on table 3, it can be seen that SBP has a median value of 150 mmHg, a minimum value of 140 mmHg and a maximum value of 185 mmHg with an average value of 152.55 mmHg and a standard deviation of 11.814 mmHg. Meanwhile, DBP has a median value of 92 mmHg, a minimum value of 90 mmHg and a maximum value of 120 mmHg with an average value of 95.11 mmHg and a standard deviation of 5.155 mmHg.

Based on Pearson correlation test, a p value of 0.000 ($\alpha = 0.05$) showed that there was a correlation between aerobic exercise habits and blood pressure in hypertension patients in their productive

age. The r value for SBP is -0.631 and DBP -0.594 that there is a negative correlation direction, which means that the higher score of aerobic exercise, the lower of blood pressure score with correlation values of 0.631 and 0.594 that shows a strong correlation. The conclusion from the table is that doing aerobic exercise can help in controlling the blood pressure. This result is in line with Istiana (2022) which states that there is a correlation between physical activity and hypertension. The individuals who are less active are have a 30-50% risk of suffering from hypertension. The duration, intensity and frequency of physical activity will affect the health benefits of the individual (Wilson, 2012).

The blood pressure is affected by physical activity and it will increase when doing physical activity and lower when resting (Trihendradi, 2013). The physical activity affects blood pressure since it is associated with an increase and decrease in sympathetic and parasympathetic nerves (Ardian, 2018). In addition, regular physical activity can reduce saturated fat, increase sodium elimination due to changes in kidney function and reduce plasma renin and catecholamine activity. Therefore, regular physical activity can reduce systolic and diastolic blood pressure to prevent hypertension.

The lack of physical activity increases the risk of suffering from hypertension since it rises the risk of being overweight. People who do less physical activity also tend to have a higher heart rate, then the heart muscle has to work harder with each contraction. The harder and more often the heart muscle has to pump, the bigger pressure are imposing on the arteries.

The research from Anwari (2018), shows that moderate and heavy physical activity can prevent stroke. In addition, the meta-analysis conducted also mentions the same thing. The results of first analysis stated that walking are lowers blood pressure in adults by 2%. In a second analysis of 54 randomized controlled trials (RCTs), aerobic activity decreased blood pressure by 4 mmHg and 2 mmHg in DBP in patients with and without hypertension. The increasing intensity of physical activity, 30-45 minutes per day is important as a strategy for the prevention and hypertension management.

Aerobic exercise or physical activity that burn 800-1000 calories will increase the high-density lipoprotein (HDL) by 4.4 mmHg. Most of epidymiological and intervention studies of aerobic exercise provide unequivocal support that increasing physical activity, sufficient duration, intensity and appropriate type can significantly lower blood pressure,

either by itself or as part of treatment therapy.

The results of research conducted by Lestari (2020), states that there is a correlation between physical activity and hypertension. The individuals who are less active have a risk of suffering from hypertension by 30-50%. The duration, intensity and frequency of physical activity will affect to body health (Karim, 2018). These results are also supported by Xavier (2017) which states that there is a correlation between physical activity and blood pressure in elderly at Elderly Posyandu, Banjarejo Village, Ngantang District, Malang Regency with the highest blood pressure at hypertension II (56.7%).

CONCLUSION

Blood pressure in hypertension patients at Karangperanti village, called TDS (Systolic Blood Pressure) has a median value of 150 mmHg, a minimum value of 140 mmHg and a maximum value of 185 mmHg with an average value of 152.55 mmHg and a standard deviation of 11.814 mmHg. Meanwhile, TDD (Diastolic Blood Pressure)has a median value of 92 mmHg, a minimum value of 90 mmHg and a maximum value of 120 mmHg with an average value of 95.11 mmHg and a standard deviation of 5.155 mmHg. There is a correlation between aerobic exercise habits and blood pressure in hypertension patients at Karangperanti Village with p value 0.000 <0.05. It is hoped that further researchers can examine aerobic exercise habits that more focus on certain aerobic exercise and can provide the newest literature for further researchers.

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