

# TEMPLATE FUNDAMENTAL AND MANAGEMENT NURSING JOURNAL

## Effect of Low-Impact Aerobic Exercise on Blood Pressure in Hypertensive Patients at Sukomulyo Community Health Center, Gresik

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### ABSTRACT

**Introduction:** Hypertension is known as a silent killer because it is often a cause of sudden death. Furthermore, many people today consume unhealthy, high-fat foods while lacking exercise. This accumulation of food leads to high cholesterol, which can trigger hypertension. To prevent and treat hypertension, exercise can be done by increasing physical activity and low-impact aerobic exercise to see if low-impact aerobic exercise has an effect on lowering blood pressure.

**Method:** This study uses a pre-experimental design research design. This type of research is quantitative research. Using a one group pretest posttest approach. The researcher measured the respondents' blood pressure using a digital blood pressure monitor before and after low-impact aerobic exercise. The researcher recorded the results on an observation sheet. The respondents then performed low-impact aerobic exercise for 20 minutes. Low-impact aerobic exercise was performed three times a week for two weeks.

**Results:** : The results of the Paired Sample T-Test obtained a p-value of  $0.000 < \alpha (0.05)$ , indicating that systolic blood pressure decreased by 6.27 mmHg with a std. Deviation of 10,074, while diastolic blood pressure decreased by 8.8 mmHg with a std. Deviation of 6,997.

**Conclusions:** There is an effect of low-impact aerobic exercise on reducing blood pressure in hypertension sufferers at the Sukomulyo Gresik Health Center. It is necessary to hold low impact aerobic exercise for hypertension sufferers in the Prolanis activities which are routinely carried out every week at the Sukomulyo Gresik Health Center.

**Keyword:** elderly; hypertension; low impact, aerobic exercise, activities.

## 1. INTRODUCTION

Chronic diseases are currently global and attack regardless of age, young or old, one of the chronic diseases that is currently attacking massively is hypertension. Hypertension is known in the eyes of the public as a silent killer because hypertension in a person often becomes a case of sudden death. Hypertension can cause several other diseases such as stroke and even heart attacks. Moreover, now many people consume unhealthy foods and high fat but they do not do enough physical activity or lack of movement, food will accumulate and trigger high cholesterol which triggers hypertension. Hypertension can be said to be a factor in death because the symptoms are felt without any complaints, sufferers are usually not aware that they have hypertension so that sufferers find out after complications occur (Safitri, 2020). The World Health Organization estimates that hypertension in 2000 was 630 million cases and will increase by around 80 percent to 1.15 billion sufferers in 2025, especially in developing countries (Ulhasanah & Widiastuti, 2022). According to data from Survey kesehatan indonesia (Ski), (2023), the prevalence of hypertension in Indonesia reached 34.11%, making it the fourth leading cause of death, accounting for 10.2% of all deaths.. The highest levels were found in East Java, at 36.32%, and Gresik Regency, at 36.42%. Based on a preliminary study conducted on July 31, 2024 at the Sukomulyo Health Center, it was found that the number of hypertension sufferers aged  $\geq 60$  years was 31 people. According to Survey kesehatan indonesia (Ski), (2023) it shows that the age group of 75 years and over, which is referred to as the elderly group, has the highest prevalence of hypertension in Indonesia at 64.00%, the East Java region has the highest prevalence of hypertension, 67.71% (Nurhayati & Indrawati, 2023). Hypertension is a major risk factor for cardiovascular disease incidents where blood pressure increases above normal as indicated by systolic and diastolic numbers (Nurafifah, 2021). Hypertension is a chronic disease characterized by increased blood pressure on the walls of the arteries. As a result, the heart has to work harder to pump blood throughout the body which can disrupt blood flow, damage blood vessels, and even cause death (Ratna & Aswad, 2019). The third leading cause of death after stroke and tuberculosis, hypertension accounts for 6.7% of deaths of people of all ages in Indonesia. Sufferers are usually unaware of hypertension before complications arise (Safitri, 2020).

According to Aulia et al (2023), risk factors are divided into 2: Uncontrollable Risk Factors, namely, Genetic (Hereditary) is if one of the family has a history of hypertension, causing a risk twice as high in family members who are blood relatives (Fauziah et al., 2021). Gender, according to Yunus et al (2021), hypertension is more common in women than men, where women are 27.5% and men are 5.8%. But hypertension can also occur in men because men often do outdoor work which triggers high blood pressure stress (Marhabatsar & Sijid, 2021), Age, According to Kemenkes (2016), elderly is someone who reaches the age of 60 years and over where the pre-elderly age is 45-59 years, elderly is 60-69 years, and high-risk elderly  $> 70$  years. When someone gets older, peripheral resistance and sympathetic nerves increase. Elderly also affects heart activity so that blood vessels and hormones are also affected. Controllable Risk Factors are Obesity, Obesity with hypertension is very common. From the results of the 2018 Basic Health Research, the increasing prevalence of hypertension in Indonesia is also followed by an increase in the number of people who are overweight or obese (Tiara, 2020), Lack of Physical Activity, According to the 2018 Basic Health Research, 33.5% of the Indonesian population lacks physical activity. This shows that the level of physical activity of the Indonesian people is still very low (Ramdhika et al., 2023).

According to Choerunnisa et al (2024), complications of hypertension can occur in organs in the body, including the heart, brain, kidneys, and eyes. In hypertensive patients, there are two types of management available, pharmacological and non-pharmacological. Non-pharmacological management can be carried out as an addition to pharmacological treatment or can be carried out simultaneously to achieve the most optimal results (Kusuma, 2021).

According to Damayanti (2020), pharmacological management is a type of treatment that aims to lower blood pressure gradually and in a controlled manner, prevent cardiovascular complications, and improve the patient's quality of life. The choice of medication is adjusted to the severity, age, and comorbidities of the patient, the obstacle is that many patients are not regular in taking medication. If non-pharmacological management such as: Reducing stress, Losing weight, Increasing exercise and physical activity, Reducing alcohol and sodium consumption, Dieting, Limiting smoking habits, Implementing complementary therapies, the benefits of which are to control blood pressure without or with medication, the obstacle is that many hypertension sufferers do not want to reduce their bad

lifestyle. According to several studies, unhealthy lifestyles and rarely exercising are the causes of blood pressure disorders. Therefore, The National Heart Foundation Joint National Committee on Detection, ASCM, WHO to prevent and treat hypertension can be done sports activities to increase physical activity (Damayanti, 2020). So researchers intervene with non-pharmacological treatment to show the effect of exercise, especially low-impact aerobics on reducing blood pressure in people with hypertension. Researchers chose low-impact aerobic exercise because it is a light movement for elderly people suffering from hypertension to do, with the aim of finding out whether there is an effect of low-impact aerobic exercise on lowering blood pressure in hypertension sufferers. Low impact aerobics is a type of exercise that uses all muscles, especially large muscles, to increase the work of the heart and lungs and repetitive body movements of body parts with one or two feet balanced on the floor (Trihartuty et al., 2022). According to M. Sari (2021), there are several benefits of low impact aerobics, namely: Making Muscles Stronger, Endurance and Heart, Making Weight Loss, Making the Body Flexible, Increasing Energy in the Body, Increasing Immunity, and can lower blood pressure in hypertension sufferers.

## **2. MATERIALS AND METHODS**

### **2.1 Design**

Research design is a process that includes planning and implementing research. The research design currently used by researchers is pre-experimental design. This type of research is quantitative research. Using a one group pretest posttest approach.

### **2.2 Population, Sample and Sampling**

#### **2.2.1 Population**

The population in the study were hypertension sufferers aged 60-69 years in May to July 2024 in the Sukomulyo health center area as many as 93 people. The average population per month of hypertension sufferers each month is around 31 people.

#### **2.2.2 Sample**

A sample is part of a population that is the source of actual data and a sample is part of a population (Adnyana, 2021). Inclusion criteria for this study: Respondents who are willing to be research subjects, Respondents with grade I or mild hypertension, and Elderly respondents aged 60-69 years. Exclusion criteria for this study: Respondents with hypertension with complications. Based on sample calculations using the Slovin formula, the sample used by the researcher was 29 people.

#### **2.2.3 Sampling**

In this study, the researcher used a non-probability sampling technique, namely the purposive sampling technique. Purposive sampling is a sampling determination technique with certain considerations, for example, by taking samples from 29 samples, data was taken before and after the intervention. (Adnyana, 2021).

### **2.3 Variable**

1. The independent variable is the low impact aerobic exercise.
2. The dependent variable is the blood pressure in hypertension patients.

### **2.4 Instruments**

The instruments used are:

#### **1. Blood Pressure Measurement**

Measuring blood pressure before and after low impact aerobics using digital tension.

#### **2. Observation Sheet**

Recording the identity and blood pressure of respondents before and after to determine the effect of low impact aerobics on reducing blood pressure in hypertension sufferers.

### **2.5 Procedure**

The stages of the procedure to obtain good results are:

1. Hold a meeting and explain to the respondents the purpose of conducting research on the effect of low-impact aerobics on reducing blood pressure in hypertension sufferers at the Sukomulyo Health Center.
2. Before doing low-impact aerobics, the researcher measured the blood pressure of the respondents with a digital blood pressure measuring device and the researcher recorded the measurement results on the observation sheet.
3. Do low-impact aerobics for 20 minutes. The procedure is carried out by a certified aerobics instructor.
4. After doing low impact aerobics, the researcher measured the respondents' blood pressure again using a digital blood pressure measuring device and the researcher recorded the measurement results on the observation sheet.
5. After measuring blood pressure and low impact aerobics, the researcher provided refreshments as a token of gratitude for their willingness to be research subjects.
6. Low impact aerobics was carried out 3 times a week for 2 weeks to see the effect of low impact aerobics on reducing blood pressure in hypertension patients at the Sukomulyo Health Center.
7. The researcher processed data from the research results.

## 2.6 Data Analysis

The data analysis in this study used two methods: univariate and bivariate analysis. Univariate analysis was performed on the dependent variable of the study results, namely blood pressure in patients with hypertension. Meanwhile, bivariate analysis was used to analyze the dependent variable influenced by the independent variable, namely low-impact aerobic exercise. To determine the effect of the independent variable on the dependent variable, a paired sample t-test was used to determine whether low-impact aerobic exercise had an effect on reducing blood pressure in patients with hypertension.

## 2.7 Ethical Clearance

Have carried out ethical clearance with the number: 076 / KET / II.3.UMG / KEP / A / 2024.

## 3. RESULT

Table 1. Characteristics of respondents in the form of age, gender, education, occupation, long suffering, and treatment of hypertension patients at Sukomulyo Health Center

Characteristic	Frequency (f)	Percentage (%)
<b>Age</b>		
60-65 Years	18	62.1
66-69 Years	11	37.9
<b>Total</b>	<b>29</b>	<b>100</b>
<b>Gender</b>		
Men	1	96.6
Women	28	3.4
<b>Total</b>	<b>29</b>	<b>100</b>
<b>Education</b>		
SD	16	55.2
SMP	13	44.8
<b>Total</b>	<b>29</b>	<b>100</b>
<b>Occupation</b>		
Ibu Rumah Tangga	28	96.6
Wiraswasta	1	3.4
<b>Total</b>	<b>29</b>	<b>100</b>
<b>Long Suffering</b>		
1-2 Years	5	17.2
3-4 Years	15	51.7

>4 Years	9	31.0
<b>Total</b>	<b>29</b>	<b>100</b>
<b>Treatment of Hypertensive</b>		
Routine	13	44.8
Sometimes	16	55.2
<b>Total</b>	<b>29</b>	<b>100</b>

Based on table 1 above, it shows that most of the elderly at Sukomulyo Health Center aged 60 to 65 years are 18 people (62.1%). Based on gender, it shows that almost all elderly are female, 28 people (96.6%). Based on education, it shows that most of the elderly have elementary school education, 16 people (55.2%). Based on occupation, it shows that almost all elderly have jobs as housewives, 28 people (96.6%). Based on data on the length of time suffering from hypertension, it shows that most of the elderly have suffered from hypertension for 3-4 years, 15 people (51.7%). Based on the treatment of hypertension sufferers, it shows that most of the elderly take medication occasionally, 16 people (55.2%).

Table 2. Data analysis using Paired Sample T-Test before and after low impact aerobic exercise in hypertension patients at Sukomulyo Health Center

	<b>Before (mmHg)</b>	<b>Std. Deviation</b>	<b>After (mmHg)</b>	<b>Std. Deviation</b>	<b>p-value</b>
<b>Blood pressure</b>					
Systolic	149.41	6.282	143.14	10.074	0.000
Diastolic	91.00	4.690	82.10	6.997	0,000

Based on Table 3, the results of the Paired Sample T-Test showed that the p value for systolic blood pressure before and after low-impact aerobic exercise was 0.000 (<0.05) and the P value for diastolic blood pressure before and after low-impact aerobic exercise was 0.000 (<0.05) which indicates that there is an effect of low-impact aerobic exercise on reducing blood pressure in hypertension patients at the Sukomulyo Health Center.

#### 4. DISCUSSION

The results of this study, obtained blood pressure results with an average systolic before low impact aerobics of 149.41 mmHg and diastolic before low impact aerobics of 91.00 mmHg, after low impact aerobics, the average systolic results were 143.14 mmHg and diastolic 82.10 mmHg. This proves that there is an effect of low impact aerobics in reducing blood pressure. The results of the analysis of the effect of low impact aerobics on reducing blood pressure in hypertension sufferers at the Sukomulyo Gresik Health Center showed that the results of the Paired Sample T-Test obtained a p value of 0.000 <math>\alpha</math> (0.05) which means that there is an effect of low impact aerobics on blood pressure in hypertension sufferers at the Sukomulyo Gresik Health Center. This study is in line with (N. A. Sari & Sarifah, 2016), which obtained the results of the systolic t-count value smaller than the t table (13.281 > 1.70 and the diastolic count value smaller than the t table (12.707 > 1.70, p value with a value = 0.000 which means very significant. Not only that, in the study Suardana et al (2023), the results of the Paired samples t-test showed a p value of 0.000 for systolic blood pressure and 0.000 for diastolic blood pressure. So it can be concluded that providing low impact aerobic exercise has an effect on lowering blood pressure in the elderly with hypertension. Then this study is also in line with Damayanti (2020), the value of the hypotension group on systolic t-count blood pressure with a probability (Sig) of 0.005 <math><0.05</math> and diastolic with a probability (Sig) of 0.007 <math><0.06</math>. So there is a significant influence on the provision of Low Impact Aerobic Gymnastics treatment in the hypotension group.

The inconsistency of the mean calculation through statistical tests and also the results of the study was caused by the fact that most elderly people do not take medication regularly, so that the decrease in blood pressure is not optimal. If the elderly do low impact aerobics regularly, the results of blood pressure measurements will be more maintained. Low impact aerobics can increase the way the heart works to its maximum and smooth blood flow in our bodies. With aerobics, body parts use tissue more often, the main one being the tissue in the heart.

#### 5. CONCLUSION

This study shows that low-impact aerobic exercise can lower blood pressure in elderly people with hypertension, with low-intensity exercise movements improving heart function. Low-impact aerobic exercise involves most of the muscles used in daily activities, and can improve cardiovascular function, metabolism, and other bodily functions. Low impact aerobic exercise can reduce heart rate which ultimately causes a decrease in blood pressure. This is proven by the fact that blood pressure before low impact aerobic exercise in hypertension sufferers at the Sukomulyo Gresik Community Health Center had an average systolic of 149.41 mmHg and diastolic of 91.00 mmHg, while blood pressure after low impact aerobic exercise in hypertension sufferers at the Sukomulyo Gresik Community Health Center had an average systolic of 143.14 mmHg and diastolic of 82.10 mmHg. This study was effective in lowering blood pressure in hypertension patients, respondents were also very enthusiastic about carrying out the intervention, the obstacle was that respondents did not arrive on time. For future research, it is hoped to conduct research on low-impact aerobic exercise with a large number of respondents and using intervention and control groups.

## 6. ACKNOWLEDGEMENT

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## 7. FUNDING SOURCE

None.

## 8. AVAILABILITY OF DATA AND MATERIALS

All data underlying the findings are fully available.

## 9. AUTHOR'S CONTRIBUTION

The author carried put all phases pertaining to this reearch study.

## 10. CONFLICT OF INTEREST

None.

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