THE INFLUENCE OF HYPERTENSION GYMNASICS TOWARD THE BLOOD PRESSURE TO HYPERTENSIVE ELDERLY PATIENTS IN DHARMA BHAKTI ELDERLY HOUSE SURAKARTA WORKING AREAS

MANUSCRIPT

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HALAMAN PERSETUJUAN

PENGARUH SENAM HIPERTENSI TERHADAP TEKANAN DARAH PADA LANSIA PENDERITA HIPERTENSI DI PANTI WREDHA DHARMA BHAKTI WILAYAH KERAJA KOTA SURAKARTA

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Apabila kelak terbukti ada ketidakbenaran dalam pernyataan saya di atas, maka akan saya pertanggungjawabkan sepenuhnya.
THE EFFECT OF HYPERTENSION GYMNASTICS ON BLOOD PRESSURE IN ELDERLY PATIENTS WITH HYPERTENSION IN DHARMA BHAKTI ELDERLY HOMES SURAKARTA WORKING AREAS

* Uswatun Hasanah Widyaningtyas  
** Okti Sri Purwanti

Abstract

The increasing age of a person, the higher the factor that supports hypertension. Number of patients with hypertension in the elderly is still high. Mild exercise such as gymnastics highly recommended to prevent hypertension. Hypertension gymnastics activities provide many benefits to the elderly, especially in improving the blood pressure. This study aimed to investigate the influence of hypertension gymnastics toward the blood pressure in elderly hypertensive patients at Dharma Bhakti Elderly Homes Surakarta Working Areas. This study using pre experiment design with two groups that consist of case group and control group. The sample in this study picked using purpossive sampling with inclusion and exclusion criteria, it consisted of 10 elderly for treatment group in Dharma Bhakti Elderly Homes Wonogiri and also 10 elderly for control group in Dharma Bhakti Elderly Homes Pajang Surakarta. Hypertension gymnastics was done for 2 weeks or 6 meetings. Blood pressure measuring tools using sphygnomanometer and stethoscope. Data were analyzed using T-test test either in pairs or independently. The results of the study in the control group before treatment, mostly with hypertension mild (grade I) and moderate (stage II) and and after treatment, mostly with hypertension mild (grade I) and moderate (stage II). An average of 161/102 mmHg before it dropped to 156/97 mmHg. In the control group before treatment, mostly with mild hypertension (stage I) and moderate (stage II) and and after the treatment is done mostly with mild hypertension (stage I) and hypertension high normal categories. On average before an average of 161/102 mmHg decreased to 136/87 mmHg. The conclusions of the study there is significant differences in blood pressure before and after in treatment group. There is no significant differences in blood pressure before and after treatment in the control group. There was a significant effect of hypertension gymnastics on blood pressure in elderly patients with hypertension in Dharma Bhakti Elderly Homes Surakarta Working Areas.

Keywords: Elderly, Hypertension, Gymnastics, Blood Pressure

1. INTRODUCTION

The 21st century is the century of elderly or called the era of population ageing (Erliana et al, 2008). Every elderly has characteristics that can be preserved, maintained, preserved and maintained for the realization of optimum quality of life of the elderly (Sutikno, 2011). The population census conducted in 2000 by the West Java Health Office the number of elderly in Indonesia 18.2 million people (8.2%), and in 2015 reached 24.4 million people (10%) of the total population in Indonesia. The census results show that the life expectancy in Indonesia has increased (Erliana et al, 2008).
The higher the life expectancy, it will become increasingly complex illness in the elderly (Kuswardhani, 2006). Life Expectancy (AHH) is a benchmark used to determine the value of the health of the population. In each region, will be different in value, because it is influenced by various factors (Sugiantari & Budiantara, 2013). In 2010 the MOH to collect data and it is known that the AHH in Indonesia is 69.43 years (Sugiantari & Budiantara, 2013).

WHO survey showed, after data collection, approximately 972 million inhabitants in the world or in percent as much as 26.4% of hypertension, where the ratio between men and women is about the same. 639 of whom are residents of the citizens of developing countries, including Indonesia (Kadulli, 2010). According to data Riskesdas (2007) prevalence of hypertensive patients in Indonesia has reached 31.7% or we say 1 in 3 persons have hypertension. People suffering from hypertension are usually unaware that they had the disease, after complications arise before they realize the presence of the disease, it causes hypertension in Indonesia is increasing, then the same should not be underestimated (Department of Health, 2009).

The increasing age of a person, the higher the factor that supports hypertension. It can be inferred because, when a person gets older, he also suffered physiological changes, such as a decrease in arterial elasticity and stiffness of blood vessels (Rizquiyatuningsih, 2014).

Based on previous research, although it has carried out various measures of prevention and treatment, the number of people with hypertension in the elderly is still very high. If not immediately addressed, there will be complications such as cardiovascular disease will increase the percentage of mortality in the elderly in Indonesia. (Fildzania, 2011). Based on this, the researchers want to conduct experiments was gymnastics hypertension implementation with the goal to reduce the number of people with hypertension in the region of Surakarta.

Many factors can influence the risk of hypertension increased incidence and one of them is age, although the main genetic factor and high salt consumption habits (Haendra & Prayitno, 2012). Mild exercise such as gymnastics is highly recommended to prevent diseases such as hypertension elderly (Elderly Commission, 2010), because gymnastics held in the morning when the conditions of the elderly are still fresh and not make the elderly tired.

Based on Edgar (2009), the treatment of hypertension is the consumption of antihypertensive agents, but maximum results can be seen after 3 to 6 months of treatment. In addition to treatment, it can be managed with a few ways to lose weight, set an eating schedule, low-sodium diet, physical activity, and limiting alcohol consumption. Edgar (2009) concluded that a low-sodium diet can lower blood pressure of 2-8 mmHg and physical activity (physical regular aerobic) is done once a week for 30 minutes can help a decrease in systolic blood pressure as much as 4-9 mmHg.

Gymnastic activities is one method that does not require tools, not using weights and a simple movement so well indicated for the elderly. Hypertension gymnastics activities provide many benefits to the elderly, especially in improving high blood pressure. Gymnastics for the elderly hypertensive well done in the morning, do as much as 3-5 times in one week, with a duration of 10-15 minutes (Soetini, 2007). The principle of gymnastics for the elderly hypertension that is done gradually, slowly and do not push yourself (Soetini, 2007).

Based on previous studies, in elderly homes have not been taught gymnastics hypertension. Dharma Bhakti Wonogiri elderly homes have a capacity of 45 occupants, based on the autonomy of local regulations, elderly homes can only receive the original residents who live in Wonogiri, but currently there are only 22 elderly people who are still registered. Of the 22 residents, the number of elderly hypertensive patients as many as 14 people. Elderly with hypertension generally only take drugs. Physical activity such as gymnastics are beneficial for blood circulation, relax the muscles and blood vessels, are still rarely carried out, including the elderly elderly homes and in the Dharma Bhakti Wonogiri Pajang has never taught gymnastics activities hypertension before. Based on the above, the question of researchers is whether there is "Effect of hypertension gymnastics on blood pressure in elderly hypertensive patients in elderly homes Dharma Bhakti Surakarta Working Areas"? 
2. METHODOLOGY

This research is experimental or also called interventional studies. Pre-experimental research methods to design nonequivalent control group design. The sampling technique in this research is purposive sampling using inclusion and exclusion criteria. The design of this study involved two groups: the experimental group and the control group. The sample in this study comprised 10 elderly for the treatment group and 10 elderly control group.

The research was done at Dharma Bhakti Wonogiri elderly homes and Pajang Surakarta. Gymnastics hypertension done was done for 2 weeks or 6 meetings gymnastics. Data were analyzed using T-test test either in pairs or independently. On March 24, 2016, results of the calibration instrument has been established that the tool used is declared in accordance PERMENKES 363 Eligible Menkes / PER / IV / 1998 and Testing Procedures / Calibration Health MOH, 2001. The study was conducted on August 2 through May 13, 2016 in Dharma Bhakti Wonogiri elderly homes and Dharma Bhakti Pajang Surakarta elderly homes.

Do pretest 15 minutes prior to the before hypertension gymnastics. After pretest, respondents prepared to be taught gymnastics hypertension. Gymnastics implemented in three phases, namely heating, the core motion, and cooling. Implementation gymnastics assisted by one instructor certified PORPI. Implementation of the gymnastics done in three stages: the first heating in two different movements for about 2 to 3 minutes. Then proceed with the movement of a core consisting of seven simple movements that involve the movement of the hands, feet, and neck. The latter is a movement that is cooling phases consisting of 2 light stretching movements at both extremities. Total implementation of the exercise performed for 15 minutes. After the exercise was completed, a post-test after resting 15 minutes. The study was conducted during two weeks in two groups, that was Dharma Bhakti Wonogiri elderly homes for the treatment group and in Dharma Bhakti Pajang Surakarta elderly homes for the control group.

3. RESEARCH FINDINGS

3.1 Univariate Analysis
3.1.1 Respondents Characteristics

a. Age

Age is a risk factor that can increase the incidence of hypertension. According Dhianningtyas & Hendrati (2006) the risk of hypertension increases with age.

<table>
<thead>
<tr>
<th>Usia</th>
<th>Kelompok Kontrol</th>
<th>Kelompok Perlakuan</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jumlah</td>
<td>f</td>
<td>%</td>
</tr>
<tr>
<td>61 – 65 Tahun</td>
<td>2</td>
<td>20</td>
</tr>
<tr>
<td>66 – 70 Tahun</td>
<td>4</td>
<td>40</td>
</tr>
<tr>
<td>71 – 75 Tahun</td>
<td>1</td>
<td>10</td>
</tr>
<tr>
<td>&gt; 75 Tahun</td>
<td>3</td>
<td>30</td>
</tr>
<tr>
<td>Jumlah</td>
<td>10</td>
<td>100</td>
</tr>
</tbody>
</table>

Based on frequency distribution table above characteristics of respondents by age in the control group and the treatment most widely known are aged 66-70 years, there are 4 people (40%) and least by the age of 71-75 years there is only one person (10%).

b. Job

Job related to a person’s physical activity, because it can increase the risk of hypertension. Anggara et al (2012) research results, found increased risk of hypertension in people whose activities have little or nowork.

<table>
<thead>
<tr>
<th>Usia</th>
<th>Kelompok Kontrol</th>
<th>Kelompok Perlakuan</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jumlah</td>
<td></td>
<td></td>
</tr>
<tr>
<td>61 – 65 Tahun</td>
<td></td>
<td></td>
</tr>
<tr>
<td>66 – 70 Tahun</td>
<td></td>
<td></td>
</tr>
<tr>
<td>71 – 75 Tahun</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt; 75 Tahun</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Jumlah</td>
<td>10</td>
<td>100</td>
</tr>
</tbody>
</table>
According to the table 2 frequency distribution of respondents by job, in the treatment group and the control group mostly with the type of work trade is 4 people (40%) in the control group and 3 (30%) and least with the type of work as a housekeeper is work at least where there is only one person (10%).

c. Sleep Patterns

Sleep patterns associated with sleep quality. This is explained by Remmes (2012) sleep disorder can cause or aggravate medical and psychiatric disorders such as hypertension, coronary artery disease or brain, obesity, and depression.

Table 3. Respondents Characteristics Based on Sleep Patterns

<table>
<thead>
<tr>
<th>Pola Tidur</th>
<th>Kelompok Kontrol</th>
<th>Kelompok Perlakuan</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>f</td>
<td>%</td>
</tr>
<tr>
<td>Normal</td>
<td>6</td>
<td>60</td>
</tr>
<tr>
<td>Terganggu</td>
<td>4</td>
<td>40</td>
</tr>
<tr>
<td>Jumlah</td>
<td>10</td>
<td>100</td>
</tr>
</tbody>
</table>

Based on Table 3 frequency distribution of respondents by known sleep patterns of both groups largely have normal sleep patterns, 6 respondents (60%) for the control group and 8 respondents (80%) for the treatment group.

d. Dietary Patterns

A diet that can increase the incidence of hypertension this case as described by the research Stefhany (2012) consumption of fat and sodium proven to significantly affect the incidence of hypertension.

Table 4. Respondents Characteristics Based on Dietary Patterns

<table>
<thead>
<tr>
<th>Pola Diet</th>
<th>Kelompok Kontrol</th>
<th>Kelompok Perlakuan</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>f</td>
<td>%</td>
</tr>
<tr>
<td>Normal</td>
<td>5</td>
<td>50</td>
</tr>
<tr>
<td>Kurangi Garam</td>
<td>1</td>
<td>10</td>
</tr>
<tr>
<td>Kurangi Gula</td>
<td>3</td>
<td>30</td>
</tr>
<tr>
<td>Kurangi Protein</td>
<td>1</td>
<td>10</td>
</tr>
<tr>
<td>Jumlah</td>
<td>10</td>
<td>100</td>
</tr>
</tbody>
</table>

Based on Table 5 frequency distribution of respondents by length of stay in a nursing home, respondents have lived in Panti average between 1-5 years, namely 8 (80%) in the control group and 7 patients (70%) in the treatment group, there were only 1 person (10%) who have lived more than 10 years.

e. Long Stay in Elderly Homes

Long stay adapting to the environment elderly homes, separated families, the elderly causing stress and prolonged stress can then be compensated hypertension.
f. Table 5. Respondents Characteristics Based on Long Stay in Elderly Homes

<table>
<thead>
<tr>
<th>Lama Tinggal</th>
<th>Kelompok Kontrol</th>
<th>Kelompok Perlakuan</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>f</td>
<td>%</td>
</tr>
<tr>
<td>1 – 5 Tahun</td>
<td>8</td>
<td>80%</td>
</tr>
<tr>
<td>6 – 10 Tahun</td>
<td>1</td>
<td>10%</td>
</tr>
<tr>
<td>&gt; 10 Tahun</td>
<td>1</td>
<td>10%</td>
</tr>
<tr>
<td><strong>Jumlah</strong></td>
<td>10</td>
<td>100%</td>
</tr>
</tbody>
</table>

Based on Table 5 frequency distribution of respondents by length of stay in a nursing home, respondents have lived in Panti average between 1-5 years, namely 8 (80%) in the control group and 7 patients (70%) in the treatment group, there were only 1 person (10%) who have lived more than 10 years.

g. History of Other Diseases

The linkage between history of disease and hypertension as described by Stefhany research study (2012) history of hypertension, obesity, and a history of diet significantly the effect on the incidence of hypertension.

Table 6. Respondents Characteristics Based on Other Diseases

<table>
<thead>
<tr>
<th>Riwayat Penyakit Lain</th>
<th>Kelompok Kontrol</th>
<th>Kelompok Perlakuan</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>f</td>
<td>%</td>
</tr>
<tr>
<td>1 – 5 Tahun</td>
<td>8</td>
<td>80%</td>
</tr>
<tr>
<td>6 – 10 Tahun</td>
<td>1</td>
<td>10%</td>
</tr>
<tr>
<td>&gt; 10 Tahun</td>
<td>1</td>
<td>10%</td>
</tr>
<tr>
<td><strong>Jumlah</strong></td>
<td>10</td>
<td>100%</td>
</tr>
</tbody>
</table>

Based on known table 6 frequency distribution of respondents by a history of other diseases in the control and treatment groups each of which there are three people (30%) had diabetes mellitus, one person in the control group suffered from heart disease and 1 (10%) in the treatment group suffer from asthma.

3.1.2 Blood Pressure

a. Pre Test

Table 7. Distribution of frequency based on the blood pressure before being given treatment (pre-test)

<table>
<thead>
<tr>
<th>No</th>
<th>Ukuran tekanan darah (mmHg)</th>
<th>Klasifikasi</th>
<th>Kelompok kontrol</th>
<th>Kelompok perlakuan</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>f</td>
<td>%</td>
</tr>
<tr>
<td>1</td>
<td>130-139/85-89</td>
<td>Normal tinggi</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>2</td>
<td>140-159/90-99</td>
<td>Derajat I (ringan)</td>
<td>4</td>
<td>40,0</td>
</tr>
<tr>
<td>3</td>
<td>160-179/100-109</td>
<td>Derajat II (Sedang)</td>
<td>6</td>
<td>60,0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td></td>
<td>10</td>
<td>100%</td>
</tr>
</tbody>
</table>

Based on Table 7 shows before being given treatment (gymnastics hypertension), in the treatment group at most with mild hypertension (stage I). As for the control group most seniors with moderate hypertension (stage II).
b. Post Test

Table 8. Distribution of frequencies awarded by the blood pressure after treatment (post-test)

<table>
<thead>
<tr>
<th>No</th>
<th>Ukuran tekanan darah (mmHg)</th>
<th>Klasifikasi</th>
<th>Kelompok kontrol f</th>
<th>%</th>
<th>Kelompok perlakuan f</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>130-139/85-89</td>
<td>Normal tinggi</td>
<td>0</td>
<td>0</td>
<td>4</td>
<td>40,0</td>
</tr>
<tr>
<td>2</td>
<td>140-159/90-99</td>
<td>Derajat I (tingan)</td>
<td>6</td>
<td>60,0</td>
<td>6</td>
<td>60,0</td>
</tr>
<tr>
<td>3</td>
<td>160-179/100-109</td>
<td>Derajat II (Sejang)</td>
<td>4</td>
<td>40,0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td></td>
<td>10</td>
<td>100</td>
<td>10</td>
<td>100</td>
</tr>
</tbody>
</table>

After given gymnastics hypertension in the treatment group 40% had no hypertensive patients with moderate (stage II), with a distribution of 60% with mild hypertension (stage I) and 40% with high normal hypertension. While in the control group decreased by 20% in patients with moderate hypertension category (Grade II) to mild hypertension (stage I). These results showed that the treatment group a significant decrease.

3.2 Bivariat Analysis

Bivariate analysis is used to determine the effect of exercise on blood pressure hypertension in the elderly in Elderly homes Dharma Bhakti working area of Surakarta. Analysis of the data consists of data normality test, homogeneity test, different test independent t-test and paired-sample t test, while the results are as follows:

a. Independent $T$-test

Independent t tests were used to determine differences in blood pressure in the treatment group and the control group before and after treatment, while the test results as follows:

Table 9. Test Results independent t test before and after treatment (systole)

<table>
<thead>
<tr>
<th>Kelompok</th>
<th>Pre Tes</th>
<th>Post Tes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kelompok</td>
<td>$t_{hitung}$</td>
<td>$p$-value</td>
</tr>
<tr>
<td>Kontrol</td>
<td>159,31</td>
<td>0,377</td>
</tr>
<tr>
<td>Perlakuan</td>
<td>160,50</td>
<td>0,065</td>
</tr>
</tbody>
</table>

The result of the calculation of the $t$ statistic for the effect of hypertension gymnastics on blood pressure in the elderly on before being given treatment obtained a value of 0.377, while amounting to 2,228, because of $(0.377) < (2.228)$, then Ho is accepted it means there is no difference in blood pressure (systolic) in the treatment group and the control group before treatment is given. These results show the initial condition before treatment in both groups with the same level of anxiety means that the two groups before treatment with similar initial conditions or the principle of equality is fulfilled.

The result of the calculation of the $t$ statistic for the effect of hypertension gymnastics on blood pressure in the elderly on after given treatment (post-test) obtained a value of 6.452, while amounting to 2,228, because of $(6.452) > (2.228)$, then Ho is rejected it means no difference in changes in blood pressure (systolic) in the treatment group and the control group after the treatment is given.

Table 10. Independent t test Test Results Before and after treatment (diastole)

<table>
<thead>
<tr>
<th>Kelompok</th>
<th>$t_{hitung}$</th>
<th>$p$-value</th>
<th>Keterangan</th>
<th>$t_{hitung}$</th>
<th>$p$-value</th>
<th>Keterangan</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kontrol</td>
<td>101,32</td>
<td>0,065</td>
<td>Ho gagal</td>
<td>90,50</td>
<td>5,052</td>
<td>0,000</td>
</tr>
<tr>
<td>Perlakuan</td>
<td>101,5</td>
<td>0,949</td>
<td>Ho gagal</td>
<td>99,32</td>
<td>9,932</td>
<td>0,000</td>
</tr>
</tbody>
</table>

The result of the calculation of the $t$ statistic for the effect of hypertension gymnastics on blood pressure in the elderly on before being given treatment obtained a value of 0.065, while amounting to 2,228, because of $(0.065) < (2.228)$, then Ho is accepted it means there is no difference
in blood pressure (diastolic) in the treatment group and the control group before treatment is given. These results show the initial condition before treatment in both groups with the same level of anxiety means that the two groups before treatment with similar initial conditions or the principle of equality is fulfilled.

The result of the calculation of the t statistic for the effect of hypertension gymnastics on blood pressure in the elderly on after given treatment (post-test) obtained a value of 5.052, while amounting to 2.228, because of (5.052) > (2.228), then Ho is rejected it means no difference in changes in blood pressure (diastolic) in the treatment group and the control group after the treatment is given.

b. Paired-Sample T Test

Paired t-test (paired t test) was used to determine differences in blood pressure before and after the treatment given to each group, while the test results as follows:

Table 11. Paired t-test (Sistol) Result

<table>
<thead>
<tr>
<th>Pre Test</th>
<th>Kontrol rerata</th>
<th>t hitung</th>
<th>p-value</th>
<th>Keterangan</th>
<th>Perlakuan rerata</th>
<th>t hitung</th>
<th>p-value</th>
<th>Keterangan</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>160,01</td>
<td>1,456</td>
<td>0,179</td>
<td>Ho gagal</td>
<td>156,16</td>
<td>16.831</td>
<td>0,000</td>
<td>Ho ditolak</td>
</tr>
<tr>
<td>Post Test</td>
<td>158,50</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The result of the calculation of the t statistic for the effect of hypertension gymnastics on blood pressure in elderly control group obtained a value of 1.456, while amounting to 2.262, because of (1.456) < (2.262), then Ho is accepted it means there is no difference in blood pressure (systolic) before and after the group control.

The result of the calculation of the t statistic for the effect of hypertension gymnastics on blood pressure in the elderly in the treatment group obtained a value of 16.831, while amounting to 2.262, because (16.831) > (2.262), then Ho is rejected it means there is no difference in blood pressure (systolic) before and after treatment.

Table 12. Paired t-test (Diastole) Result

<table>
<thead>
<tr>
<th>Pre Test</th>
<th>Kontrol rerata</th>
<th>t hitung</th>
<th>p-value</th>
<th>Keterangan</th>
<th>Perlakuan rerata</th>
<th>t hitung</th>
<th>p-value</th>
<th>Keterangan</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>101,01</td>
<td>1,824</td>
<td>0,101</td>
<td>Ho gagal</td>
<td>99,50</td>
<td>9,266</td>
<td>0,000</td>
<td>Ho ditolak</td>
</tr>
<tr>
<td>Post Test</td>
<td>99,32</td>
<td></td>
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The result of the calculation of the t statistic for the effect of hypertension gymnastics on blood pressure in elderly control group obtained a value of 1.824, while amounting to 2.262, because of (1.824) < (2.262), then Ho is accepted it means there is no difference in blood pressure (diastole) before and after the group control.

The result of the calculation of the t statistic for the effect of hypertension gymnastics on blood pressure in the elderly in the treatment group obtained a value of 9.266, while amounting to 2.262, because of (9.266) > (2.262), then Ho is rejected, it means that there is a difference in blood pressure (diastole) before and after treatment.

3.3 Blood Pressure After Treatment

Blood pressure after treatment, namely by using a gymnastic therapy of hypertension in the treatment group experienced a significant decrease in blood pressure. At the initial conditions with an average of 161/102 mmHg decreased to 136/87 mmHg. While 161/102 mmHg in the control group dropped to 156/97 mmHg. This illustrates the group given exercise therapy of hypertension decreased quite sharply compared with the control group, this can be seen in the following graph:
In the graph above shows the group given hypertension gymnastics decreased more sharply than the group that was not given gymnastics hypertension. This shows the effectiveness of blood pressure lowering effect is significant enough hypertension gymnastics. According Afriwardi (2011) Decrease in blood pressure caused by the movement of the muscles that do the rhythm and repetitive motion. This movement will stimulate the heart with the intensity of light, or intensity of regular exercise provides benefits for the elderly, namely the improvement of cardiovascular, musculoskeletal function improvement, the ability of other bodily functions as well as mental improvement.

4. DISCUSSION
4.1 Respondents Characteristics

a. Age

The age of the control group and the treatment of the most widely known are aged 66-70 years, there are 4 people and least by the age of 71-75 years there is only one person. Age merupan risk factors that can increase the incidence of hypertension. According to (Dhianningtyas & Hendrati, 2006) the risk of hypertension increases with age. Increased risk of arterial pressure caused increases with age, the occurrence of aortic regurgitation, as well as the degenerative process, which is more frequent in old age. Increasing age was also followed by lowering the metabolic function, so that by itself will diikut enhancers diseases such as neurological disorders, vascular disorders, and heart problems.

The link between age and incidence of hypertension, as described by the research Anggara, et al (2012) with the result of over 40 years of age (> 40 years) at risk of hypertension by 11.71 times compared to under 40 years of age (<40 year). Reinforced also by research Rahayu (2012) aged significant effect on the incidence of hypertension. Increasing age will be followed by a decrease in cardiovascular function that will lower the elasticity of blood vessels, which is why the age increases the risk of hypertension.

b. Job

The survey results revealed in the control group and the case group the majority denagn type of work trade is 4 people in the control group and slightly with the kind of work as a housekeeper is a job for at least where there is only one.

Job related to physical activity of someone. Jobs can increase the risk of hypertension. Anggara research results, et al (2012) found increased risk of hypertension in people who do not work or little physical activity. It is also clear from the research Arifin (2015) Physical activity can lead to increased blood flow and it produces nitric oxide (NO). Nitric oxide stimulates the formation of endothelial derive relaxing factor (EDRF), which causes widening of arteries. Regular physical activity will cause blood vessels tend to be more elastic thus reducing peripheral resistance. In turn will cause your heart work more efficiently so that cardiac output will be reduced and will cause a drop in blood pressure.
Research by Anggara, et al (2012) also describes the work would significantly affect the incidence of hypertension. Research by Rahayu (2012) Regular physical activity can reduce the risk of hypertension.

c. Sleep Patterns

The survey results revealed an unknown sleep patterns of both groups largely have normal sleep patterns. Sleep patterns associated with sleep quality. This is explained by Remmes (2012) sleep disorder can cause or aggravate medical and psychiatric disorders such as hypertension, coronary artery disease or brain, obesity, and depression. While Gangwisch et al., (2006) describes a lack of sleep can refer to poor sleep quality. A lack of sleep can lead to the development of hypertension that is by increasing the sympathetic activity, improve physical and psychological stressors, and increase retention of salt.

Sleep-quality relations with the incidence of hypertension was also described by Bruno et al. (2013), that poor sleep quality was significantly associated with resistance to treatment in women with hypertension, which is a combination of cardiovascular disorders with psychiatric disorders, while resistance to treatment in men with age-related hypertension, diabetes mellitus, and obesity. Research Intan (2014) also explained that there is a relationship between sleep quality with blood pressure in hypertensive patients.

d. Dietary Patterns

Results of research on dietary patterns of respondents indicated in the control group and each treatment there are 5 people normal. Diet or diet can affect the prevalence of hypertension, it is just as described Marliani and Tantan (2007) that a diet for people with hypertension is to limit sodium intake, both derived from salt or from foods that contain cholesterol, reproduce consume containing foods as well as food. The setting of these foods is popularly called a diet low in salt, low in cholesterol, high in fiber.

A diet that can increase the incidence of hypertension such as the consumption of fat, sodium intake this case as described by the research Stefhany (2012) consumption of fat and sodium proven to significantly affect the incidence of hypertension. The same is also described by the research Widyaningrum (2012) Consumption of fat, sodium intake and fiber consumption was significantly associated with the incidence of hypertension. In this penelitian also found a pattern of food triggers hypertension include mutton, beef or chicken skins, chips, beef jerky, shredded, salted fish, salted eggs, milk powder and butter.

e. History of Other Diseases

Results shows the history of other diseases in the control and treatment groups each of which there are 3 people had diabetes mellitus, one person in the control group suffered from heart disease and 1 person in the group treated with asthma. History of the disease can increase the risk of hypertension genetical factors such as family history of hypertension, previous history of hypertension, and insulin resistance associated with obesity. It is as described by the shills (2006) genetics plays an important role in the occurrence of hypertension. If both parents suffer from essential hypertension, the chances of children suffering from hypertension is one in two. If one of the parents (father only or mother only) suffering from hypertension, his chances of suffering from hypertension is one in three. Meanwhile, if both parents did not suffer from hypertension, his chances of suffering from hypertension is 1 in 20. Obesity is associated with insulin resistance. On average 25-50% of people who are not obese and non-diabetic suffering from hypertension could also develop resistance to insulin. The high insulin is associated with an increased risk of hypertension both in the African-American race and the white race. Other evidence showed that insulin resistance is associated with sensitivity to salt.

The linkage between history of disease and hypertension as described by Stefhany research study (2012) history of hypertension, obesity, and a history of diet significantly the effect on the incidence of hypertension. The risk of hypertension increases in patients whose family or himself had experienced hypertension. While obesity is associated with insulin resistance also increases the risk of hypertension.
4.2 Blood Pressure Before Treatments

Results showed before being given treatment (gymnastics hypertension), the average group with hypertension stage I and stage II. It describes the average lans hypertension with mild and moderate categories. Hypertension in the elderly easily occur with age. According to the Department of Health (2006), increasing age, the risk of developing hypertension becomes larger so that the prevalence of hypertension among the elderly is quite high, around 40%, with deaths around over the age of 65 years (MOH, 2006). Yogiantoro (2006) states that individuals aged 55 years have a 90% risk of developing hypertension. According Krummel (2004) explained that systolic blood pressure continues to increase up to 80 years and diastolic pressures continue to increase until the age of 55-60 years, then decrease slowly or even declined drastically.

The incidence of hypertension in the elderly is a natural thing increased age. Rizqiyatuningsih (2014) describes a person gets older, he also suffered physiological changes, such as a decrease in arterial elasticity and stiffness of blood vessels, which is why the risk of hypertension will increase with age. The existence of many things you can do to reduce the risk of hypertension in the elderly. Elderly should be considered food intake and physical activity. Physical activity with light exercise like gymnastics is highly recommended to prevent diseases such as hypertension elderly (Elderly Commission, 2010), because gymnastics held in the morning when the conditions of the elderly are still fresh and not make the elderly tired. Edgar (2009) explain the hypertension can be managed with a few ways to lose weight, set an eating schedule, low-sodium diet, physical activity, and limiting alcohol consumption. Edgar (2009) concluded that a low-sodium diet can lower blood pressure of 2-8 mmHg and physical activity (regular aerobic physical) done once a week for 30 minutes can help lower blood pressure as much as 4-9 mmHg systolic.

4.3 The Effect of Hypertension Gymnastics on Blood Pressure in Patients with Hypertension in Dharma Bhakti Elderly Homes at Surakarta Working Areas

The results showed hypertension after being given gymnastic gymnastics hypertension decreased quite good. From an average of grade I and II hypertension dropped to a normal height. This shows the effectiveness of hypertension gymnastics in lowering blood pressure in the elderly. Elderly or people with advanced age need physical activity and mental functions of the body that can be maintained. One of the recommended physical activity is gymnastics. Maryam, (2008) explains that the blood flow to be smooth, it is necessary to do sports or physical exercise. One elderly exercises you can do is exercise. In elderly heart pump engine power is reduced. Various blood vessels are of special importance in the heart and brain experience stiffness. With physical exercise or gymnastics can help the heart pump power to be increased, so that blood flow can be returned to normal. If done on a regular basis will give a good impact for the elderly on their blood pressure. Explanation answered assumption why exercise can lower blood pressure and missed in this study.

Statistical test results both systole and diastole showed a significant influence on the improvement of hypertension Award gymnastics blood pressure in the elderly. In the treatment group before and after there is significant difference (p <0.005), while the control group there was no significant difference (p> 0.05). Comparison of both can be seen from the average value of the final result of the treatment group (gymnastics hypertension) that is equal to 136/87 mmHg, while the control group average of 156/97 mmHg final test results. This proves gymnastics hypertension positively and significantly decreased blood pressure in the elderly.

The effectiveness of blood pressure reduction as a result of the provision of gymnastics also supported by research conducted by Isesreni and Minropa (2012) which melakukan study the influence of gymnastics elderly to decrease blood pressure in elderly hypertensive RW II, RW XIV, and Rw XXI Sub Surau Tower Work Area Nanggalo puskesmas Padang year 201. These results indicate there is a significant effect on blood pressure in elderly hypertensive after elderly gymnastics. Another study by Fagard (2001) with the results of physical exercise with a frequency of 5 times per week for 30-60 minutes per session with an intensity of 40-50% effective in lowering blood pressure. While research by Fetri Wahyuni (2012) explained that there were significant differences in the reduction of blood pressure is very significant in the experimental group (gymnastics elderly: low impact aerobics) with the obtained p value 0.000 (systole) and p value 0.000 (diastole) (p <0, 05 measurements derived from the value pretest mean systolic blood pressure in the experimental group amounted to 153.59 mmHg, diastolic pre-test of 95.29 mmHg and post-test of 142.06 mmHg systolic, diastolic post-test of 85.71 mmHg.
5. CLOSING

5.1 Conclusions

Research to determine the effect of hypertension gymnastics on blood pressure in elderly hypertensive patients in elderly homes Dharma Bhakti Surakarta Working Areas, it can be concluded as follows:

1. In the treatment group before gymnastics, mostly elderly people suffering from mild hypertension (stage I) and the results of pre-test in the control group most of the elderly suffer from moderate hypertension (stage II)

2. After doing gymnastics in the treatment group, mostly elderly decreased to hypertension, high normal categories, indicating the treatment group a significant decrease. While in the control group, post test results showed that most of the elderly are still suffering from mild hypertension (grade I), which means that in the control group decreased but not significantly.

3. Based on the analysis of the results, it can be concluded that there was gymnastics effect of hypertension on blood pressure in elderly hypertensive patients in elderly homes Dharma Bhakti Wonogiri.

5.2 Suggestions

a. For Elderly homes

Gymnastics program providing hypertension effectively lower blood pressure in the elderly. For nurses, doctors or elderly homes attendant suggested giving gymnastic exercises on a regular basis in addition to physical activity, especially for the elderly who suffer from hypertension and control the nutrition of the elderly in order to optimize the result of a decrease in blood for the elderly.

b. For Educational Institutions

The results of this study are expected to be added to the literature study and is expected to be useful and meaningful input for nursing students in understanding gerontological or elderly nursing.

c. For Researchers

This research is still far from perfection, one of which is the absence of variables difficult to be arranged so that researchers do not know the extent of effectiveness of the therapy and how big the influence of other factors. Future studies are expected to be able to experiment with different types of physical activity, so it can be found a type of therapy that physical activity is appropriate for the elderly.

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