Effects of Meditation on Blood Pressure in Elderly Hyperstension at Panti Werda Karitas Cimahi West Java Indonesia

1Murtiningsih*, 2Rafi Ahmad Fauzi, 3Kiki Gustriyanti
1,2,3 Stikes Jenderal Achmad Yani Cimahi
*Email: murty_68@yahoo.com

Abstract
One out of ten people in the world suffers from hypertension. Indonesia is the 10th country with the highest prevalence of hypertension in the world (Depkes RI, 2009). Hypertension is the most common disease faced by the older age groups. Increased cases of hypertension in elderly become a big problem (Risksdias, 2013). However, the treatment of hypertension has been focused only on medicine. This study aims to determine the effect of meditation on blood pressure in elderly hypertension at Panti Werda Karitas Cimahi West Java Indonesia. This study used pre-experiment one group pretest-posttest design. The sample of 18 elderly hypertension are taken by total sampling technique. The result shows that the difference of systolic blood pressure before and after meditation is 18.89 mmHg. While the difference of diastolic blood pressure before and after meditation is 9.44 mmHg. The result of statistical test obtained p value < 0.001. In conclusion, meditation is highly effective to decrease blood pressure in elderly hypertension. Meditation can be recommended one of the influential therapy interventions in nursing care of gerontology to reduce hypertension in the elderly. Furthermore, this influential therapy can be incorporated into the schedule of daily activities in the elderly. They can meditate independently after being trained.

Key words: Blood pressure, elderly, hypertension, meditation

Introduction
One out of ten people in the world experiences hypertension. World Health Organizations (WHO) proves that hypertension contribute to a global burden of worldwide epidemic. The condition caused by high blood pressure remains to a major issue of global concern both in developed and developing countries. In fact, almost of 8 million of people in the world and 1.5 million of people in South East were killed by this harmful disease (Wade, 2016).

Indonesia is the 10th country with the highest prevalence of hypertension in the world as well as Myanmar, India, Sri Lanka, Bhutan, Thailand, Nepal and Maldives (Depkes RI, 2009). The prevalence of hypertension in Indonesia faced by people after the age of 18th (26.5%) where Bangka Belitung (30.9%) emerges as the first province with the highest number of hypertension. It is followed by South Kalimantan (30.8%) and East Kalimantan (29.6%).

The high prevalence of hypertension rapidly emerges in the elderly groups. According to Riskesdias, (2013) the age of sufferer on the prevalence of hypertension can be divided into several groups: people at 25-34 years old (14.7%), 35-44 years old (24.8%), 45-54 years old (35.6%), 55-64 years old (45.9%), 65-74 years old (57.6%) and after 75 years old (63.8%). Indonesian older population is growing faster every year. Nowadays, there are 16 million of people at the age of 65th and this assumes to be increased into 25.5 million in 2020 or around 11.47% from the total population in Indonesia. Therefore, Indonesia take the 4th rank with the highest aging population under Tiongkok, United States, and India (Priyoto, 2015).

As the case of elderly hypertension rising quickly in Indonesia, it takes a part to the dangerous global issue around the world. In this case, government has been cooperated with Indonesian Society of Hypertension to reduce this harmful disease by creating The Centers for Disease Control and Prevention. This organization makes the rule and share the knowledge to reduce hypertension (Depkes RI, 2010). Therefore, Indonesian government has been effort to improve and rise more logistic due to avoid the risk factor causing heart disease and hypertension. In addition, this program aims to develop human resources and changes the charge system to maintain and evaluate its control. Thus, the rate of hypertension prevalence declined and can be controlled (Depkes RI, 2010).
The treatment hypertension using anti-hypertension medicine and non-pharmacology therapy by controlling weight, stop smoking, and doing sport routinely are useful to reduce hypertension (Dalimartha, 2008). Furthermore, yoga, meditation and hypnosis can control autonomic nervous system that is highly effective to reduce blood pressure (Puspitasari, 2014). Nowadays, therapy given to elderly hypertension is pharmacology rather than non-pharmacology therapy. Moreover, non-pharmacology takes a great influence in reducing hypertension (Triyanto, 2014).

Meditation is one out of several non-pharmacology therapies to reduce hypertension. It is easier to be conducted for all people in all ages, both adult and elder group. When they get meditation, the oxygen consumptions and metabolism system in their bodies will optimally decrease. The level of oxygen consumption in meditation people is lower (7%) than in normal condition. In this process, the vasodilator including adenosine is released into the space between cells that affects to slowly electrical conduction, slow heart rate and rhythm and vasodilation on blood vessels (Gunawan, 2012).

Acetylcholine will be constantly produce during meditation and it affect to less activity on hypothalamus and catecholamine (adrenaline and non-adrenaline). On the other hand, acetylcholine in the blood will be more widely used by parasympathetic system and it will dominantly take a great role than sympathetic system. Therefore, meditation affects to relaxation, makes slow heart rate and rhythm and maintains normal blood pressure (Puspitasari, 2014).

In addition, nurses can help to solve the problem of elderly hypertension using meditation as non-pharmacology therapy. Meditation is one of easier therapy for elderly hypertension since it shows the easier movement that can be trained independently. As the phenomenon of elderly hypertension arise, it forces the author to conduct research dealing with the effects of meditation on blood pressure in elderly hypertension at Panti Werda Karitas Cimahi West Java Indonesia.

**Method**

This study uses pre-experiment test employing one group pretest and posttest design. It is illustrated in figure below:

![Fig 1. Research Framework](source)

Elderly hypertension in Panti Werda Karitas Cimahi are participated in this research. They are not suffering from dementia, language disorder, and movement disorder. Therefore, the total of elderly hypertension in Panti Werda Karitas Cimahi are 18 respondents and it employs total sampling technique.

The instrument of this research involves SOP meditation, mercury sphygmomanometers, and stethoscope. In this process, the author firstly explained the purpose and the benefits of meditation for elderly hypertension and making a procedure dealing with respondents’ rights during conducting this research. Then, the author measures blood pressure in elderly hypertension as pre-test data. The respondents are allowing to relax by sitting freely on the chair before the treatment is given. However, they asked not to give many movements and untalkactive. The author removes the excess clothing by rolling up the sleeves and put BF cuff flow in the left-armed. This is very useful to get the accurate result on blood pressure measurement. Finally, the authors provide and gives the informed concern sheet that must be signed by all respondents. In this case, 18 elderly hypertensions are agree to participate in this research.

The authors demonstrate and promote the procedure of meditation as long as 15 minutes for...
each of respondents in Panti Werda Karitas Cimahi. They offer the bond to be signed by respondents including time and place for meditation. Both of the authors and respondents choose respondents’ room for meditation in which the room must be clean, neat and clear from the noises. Meditation is conducted at 4.00 – 5.00 pm since they are in the free time and meditation is free from any restrictions.

Furthermore, the authors use meditation as an intervention. In this process, the authors spent around 15 minutes per respondent. The steps are conducted as follow:
1. Respondents must follow the authors’ instructions
2. The authors ask them to wear the loose, soft, and calming clothes.
3. The authors ask them to sit freely on the comfortable chairs where they can relax
4. Respondents follow the instructions as follows:
   a. Closing their eyes
   b. Resting their hands on the knees
   c. Observing the rising and falling of the breathing
   d. Relaxing all of muscles
   e. Considering the positive affirmation “I want to be healthy, I want to reduce highly blood pressure, and I want to concentrate my mind.”
   f. Being sincere with all moment
   g. Focusing on deep breathing if something wrong happened
   h. Meditation take 15 minutes to be conducted
   i. Opening their eyes.

   The authors evaluate and ask respondents feeling after they got meditation. Then they discuss to have another meeting in the different time and place. It needs around 15 minutes for meditation in once a day and it will be treated in three days a week. The authors measure blood pressure of the respondents after all process and procedure are given appropriately.

Blood pressure is measured in the last day of meditation and the respondents are allowed to get sitting freely in 5 minutes to get the normal heart rate and rhythm. According to Mubarak, Indrawati and Susanto (2015), blood pressure measurement after doing an activity will be better to be conducted in 5-10 minutes due to getting the accurate results.

The finding shows that blood pressure of all respondents is decreased. However, the blood pressure in 2 out of 18 respondents is not significantly decreased in which their blood pressure are 150/90 mmHg. There are several influential factors causing this condition include having diet and smoking. During conducting the research, the author did not know all of respondents’ daily activities and these factors are out of the authors’ control.

The authors move to another step by analyzing the data after completely collected. The process of analysis uses computerization system and the results are derived by Shapiro-Wilk due to a few of samples (≤50 respondents). P value 0,21 in systolic blood pressure and P value 0,08 in diastolic blood pressure. The finding shows that blood pressure before and after meditation is normally distribution. Bivariate analysis in this study is used to analyze the differences of blood pressure before and after meditation using t-test dependent.

Results

Table 1. The average of systolic and diastolic blood pressure in elderly hypertension before meditation

<table>
<thead>
<tr>
<th>Blood Pressure</th>
<th>Average (SD)</th>
<th>CI 95%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sistolik (n=18)</td>
<td>160,00 (11,88)</td>
<td>154,09 - 165,91</td>
</tr>
<tr>
<td>Diastolik (n=18)</td>
<td>90,00 (11,88)</td>
<td>84,09 - 95,91</td>
</tr>
</tbody>
</table>

Table 2. The average of systolic and diastolic blood pressure in elderly hypertension after meditation

<table>
<thead>
<tr>
<th>Blood Pressure</th>
<th>Average (SD)</th>
<th>CI 95%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sistolik (n=18)</td>
<td>141,11 (11,32)</td>
<td>135,48 - 146,74</td>
</tr>
<tr>
<td>Diastolik (n=18)</td>
<td>80,56 (5,66)</td>
<td>77,74 - 83,37</td>
</tr>
</tbody>
</table>
Table 3. The differences of systolic and diastolic blood pressure in elderly hypertension before and after meditation

Table 3 shows that the differences of systolic blood pressure before meditation is 160,00 mmHg with deviation standard 11,88 and after meditation is 141,11 mmHg with deviation standard is 11,32. Likewise, the differences of diastolic blood pressure before meditation is 90,00 mmHg with deviation standard 11,88 and after meditation is decreased to 80,56 with deviation standard is 5,66. Statistical test obtained that p value < 0,001, it refers to meditation affects to decrease blood pressure in elderly hypertension.

Discussion

1) The average of systolic and diastolic blood pressure before meditation

The finding shows that all of respondents get isolated systolic hypertension with the difference of systolic blood pressure is 160,00 mmHg. This finding is appropriate to Martin and Mardian research (2016) which proved that almost 20 respondents experience isolated systolic hypertension with the average of systolic blood pressure are 148,25 mmHg.

In isolated systolic hypertension, systolic blood pressure more than 140 mmHg but diastolic is less than 90 mmHg (Darmojo, 2011). This condition caused by several factors including age and gender (Dalimartha, 2008). Data of this study prove that respondents are in 68-95 year old involving 5 males and 13 females.

The age of respondents influentially affects to isolated systolic hypertension since it is related to aging process causing disability or failed to get cells regeneration (Priyoto, 2015). In this case, heart and vessels are going to change structurally and functionally as people grow older including arterial stiffness or decreased aortic elasticity. This is caused by increasing collagen production and losing elasticity in blood vessel layers. Arterial intima layers become thickened and it improve potassium. This condition reduces aortic compliance and affects to widely blood vessels resulted in increasing systolic blood pressure (Stanley & Beare, 2012).

The finding shows that 13 out of 18 elderly hypertensions are female respondents. It means that almost of female respondents in Panti Werda Karitas Cimahi suffer from hypertension. It is appropriate to Darmojo (2011) who stated that around 6-12% after the age of 60th suffer from systolic hypertensions especially female. Another research by Sudiarto, Wijayanti and Sumedi (2007) prove this finding which stated that 20 females out of 30 respondents experienced isolated systolic hypertensions.

This condition caused by menopause experienced by female at the age of 68 – 95th. In fact, estrogen hormone which provide the crucial role as well as stimulates maturation in their reproductive organs, maintains the structure of normal skins and blood vessels is slowly decreased. Therefore, endothelial dysfunction is occurred causing highly activity in sympathetic nerves. This affects to renin-angiotensin II and resulted in isolated systolic hypertension (Susilo, Wuladari, 2011).

Isolated systolic hypertension is the higher risk factors of heart failure, stroke and chronic kidney disease for the elder group. Systolic blood pressure will be in 140-159 mmHg while diastolic is in <90 mmHg that caused high morbidity and mortality of cardiovascular disorder significantly. This condition gives 3 times of chance in female mortality than male (Lewa, Pramantara, Rahayujiati, 2010). Result and discussion proved that all of respondents get isolated systolic hypertension before medication therapy is given.

2) The average of systolic and diastolic blood pressure after meditation

The findings show that both systolic and diastolic blood pressure are in 141,11/80,56 mmHg. It means that these blood pressure are reduced after meditation therapy. This finding shows the similar
result to Harmilah, Nurachmah and Gayatri (2011), they proved that systolic blood pressure is decreased to 25 mmHg and diastolic is in 8.64 mmHg after meditation is being trained.

In this study, the authors use two types of mediation including breath and concentration. Breathing process become one strategical and influential mediator between mind and soul. In this study, the respondents use diaphragmatic breathing while mediation where abdominal muscles with the deep breath is placed under the umbilicus. Inspiration volume and oxygen consumption in blood vessels arise while breathing and it stimulates nitric oxide. This type of oxide belongs to vasodilator in managing blood pressure. Nitric oxide is released from arterial and arteriolar endothelium which provides the relaxation in smooth muscle causing blood vessels vasodilation. People who suffer from hypertension will experience nitric oxide disorder since it cannot optimally produce if it is not being stimulated. Therefore, nitric oxide will be produce by doing mediation that make blood vessels relaxed (Khrisna, 2013).

On the other hand, mediation is given to get concentration on mind and breathing. Concentration practice while breathing affect to low stimulation on stressor and it resulted to production of adrenaline and non-adrenaline hormone in hypothalamus. This condition will give limited activity in sympathetic nerves resulted in blood vessels vasodilation (Mubarak, Indrawati & Susanto, 2015).

The other factor beside two factors contributing to decreased blood pressure is the successful cooperation between respondents and the authors. All of respondents follow the instruction and doing mediation rightly until it is done. Iskandar (2014) highlight, mediation will be effective and beneficial when it becomes a routine activity and perceived a balanced condition for both mind and soul. Widodo and Purwaningsih (2013) proved that mediation will increase healthy condition for elderly hypertension. In conclusion, mediation is optimally effective in reducing hypertension in elderly.

3) The effect of mediation to elderly hypertension

The findings show that blood pressure in elderly hypertension is change after mediation. The average of systolic blood pressure before and after mediation decrease to 18.89 mmHg while diastolic blood pressure changes into 9.44 mmHg. Statistical test resulted I p value <0.001. It shows that mediation significantly affects to reduce blood pressure in elderly hypertension.

The findings are appropriate to the research by Suardana and Maryati (2014) which proved that mediation affects to blood pressure both systolic and diastolic. In fact, these blood pressure before mediation reach to 150.40/98.50% and after mediation they reduce into 145.30/91.80 mmHg with p value for systolic is 0.022 and p value for diastolic is 0.047.

The positive effect of mediation derived by the successful research. Mediation is conducted in a clean, neat and clear room in Panti Werda Karitas Cimahi. These comfortable room makes all of respondents can concentrate and being comfortable. According to Gunawan (2012) there are three factors to reach the effective mediation include socio-environment, mediation posture and concentration.

Mediation posture used in this research lead into several step. The respondents is sitting relaxed in a comfortable chair firstsly. The neck should straightly have relaxed as well as the head, hands must rest on the knees, close the eyes and put the positive mindset. The clean environment and appropriate mediation posture will give the balanced condition and our body will spend minimum energy and will be healthier (Widianto, 2011).

The findings are appropriate to the theory of mediation effect to blood pressure. When people get mediation, the level of acetylcholine in their blood will be constant due to the less of activity in hypothalamus and adrenaline and non-adrenaline is significantly reduced. On the other hand, acetylcholine in blood will be more produced and will be widely used by parasympathetic nervous system. Therefore, people will be more relaxed, get slow respond of heart rate, and normal blood pressure while meditation (Puspitasari, 2014).

In addition, people will be more concentrated and relaxed during meditation. In fact, they are able to control the emotion and dominate the situation inside. The oxygen consumption will be reduced as well as metabolism system. Oxygen consumption for people during meditation is lower (17%) than normal condition. The oxygen consumption will significantly decrease when body feel relaxed. Therefore, the vasodilator including adenosine is released into the space between cells that affects to slowly electrical conduction, slow heart rate and rhythm and vasodilation on blood vessels (Gunawan, 2012).
Mediation in once a day around 15 minutes and it is routinely conducted in 3 days is very effective to reduce blood pressure in elderly hypertension. However, the blood pressure of 2 males at the age of 75-80th out of 18 respondents doing meditation are not significantly reduced. In fact, their blood pressure after meditation are 150/90 mmHg. According to Mubarak, Indrawati, and Susanto (2015) their blood pressure is getting exceed from the normal blood pressure for elderly hypertension at least as 140/90 mmHg.

The authors assume that this insignificant blood pressure derived from uncontrolled diet and smoking. They confess that they always eat salty foods and eggs. However, the authors ask them to avoid this two usual conditions since it is very harmful for elderly hypertension. According to Dalimartha (2008), diet and smoking are two risk factors affect to blood pressure. In fact, salty food, or food contained fat and cholesterol can significantly improve the level of blood pressure.

The excessive iodine in our body will affect to high plasma volume, quick heart rate and high blood pressure as it is followed by iodine excretion. Likewise, unconsciously creates the constriction of blood vessels in kidney and quit the blood flow. Therefore, kidney has the function to produce angiotensin to create high blood pressure and blood is optimally flowing in our body. This phenomenon is similar to fat and cholesterol since both of them can produce vascular plaque in blood vessels. In fact, the constriction of blood vessels causing the high and quick heart rate and resulted in hypertension (Triyanto, 2014).

When people smoking, nicotine is indirectly absorbed through the skins, nose, mouth, blood vessels until the brain and losing epinephrine hormone. It belongs to another factors caused constriction in blood vessels in the brain. Therefore, they will suffer hypertension caused by vasoconstriction in brain (Triyanto, 2014).

The findings show that blood pressure of the respondents are optimally reduced after meditation. They realized getting another positive responds include the better condition of their body. As Prayitno (2014) stated that meditation is assumed to give the normal functions of the brain as well as the feeling. The healthier condition makes happier feeling arise. Otherwise, the negative feeling includes angry, envy and depressed will be easier to be perceived if there is negative condition in our body. Therefore, it can be recommended for further research dealing with the effects of meditation to depression or the quality of elderly life.

The findings are expected to be an alternative way in applying mediation to reduce blood pressure in elderly hypertension as non-pharmacological therapy. In addition, there are several factors contributing to high blood pressure includes diet, physical activities, and smoking.

Conclusion

The findings show that the average of blood pressure in elderly hypertension before mediation is 160.00/90.00 mmHg while after meditation it is decreased into 141.11/80.56 mmHg. There are the differences of blood pressure before and after meditation as it proves by systolic blood pressure which changes into 18.89 mmHg and diastolic blood pressure reduced to 9.44 mmHg. Bivariate statistical test obtained p value < 0.001. It proves that meditation give the great influences to reduce blood pressure in elderly hypertension.

Meditation therapy is recommended as an influential intervention in nursing care of gerontology especially for elderly hypertension. This therapy can be a new routine activity for elderly hypertension since it is very beneficial for them. Furthermore, it can be easier and can be conducted independently.

The further research can investigate more about the benefits of meditation employing the different method and involving controlling group for the samples due to comparing the samples treated by meditation and another group without meditation therapy. For example, conducting research dealing with the effects of meditation to the quality of elderly life or to the stressful condition.

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References


