
The impact of lemon aromatherapy and breath relaxation in blood pressure on hypertensive elderly at Patukan Gamping Sleman Yogyakarta

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Abstract

Hypertension is defined as the increase of chronicle blood pressure that is usually happened on elderly people. Hypertension belongs to one of Cardiovascular Disease (CVD) that becomes the cause of 80% mortality in Indonesia. One of non-pharmacological medical treatment for hypertension was by using the lemon aromatic therapy and inner relaxation breath. This therapy aims to give calming and comforting effect that leads to the decrease of heart performance and blood pressure. To find out the impact of lemon aromatic therapy and inner breath relaxation toward blood pressure on elderly people's hypertension. This research belongs to Quasy Experiment Research Design by implementing Non Equivalent Control Group with one treatment group and one controlled group. This research implemented total sampling technique with 22 respondents in total. The mann-whitneystatistical analysis showed that p value 0,000 of the diastole blood pressure was at 0,016 with trustworthiness at α 0,05. There is impact of lemon aromatic therapy and inner relaxation breath toward the decrease of blood pressure on the hypertension patient. The patient of hypertension is suggested to use lemon aromatic therapy and inner relaxation breath as one of non-pharmacological medical treatment that can reduce the high blood pressure.

Keywords: *hypertension, lemon aromatic therapy, inner*

INTRODUCTION

Hypertension is defined as a medical state when the blood pressure increases chronically. It can be happened since the heart pumps harder to supply oxygen and nutrition all over the body (Riskesdas, 2013). Hypertension is a disease that is often found in elderly people (Soraya, Tafwidhah, & Adiningsih, 2014).

Ageing is a process of body function degeneration. The data about elderly people in Indonesia based on the survey of National Economy Survey 2014 showed that there were 20,24 million people. The Special Province of Yogyakarta possessed the highest number of the elderly population at about 13.05% then followed by Central Java Province (11,11%), East Java (10,96%) and Bali (10,05%) (Bappenas, 2015). Hypertension in Indonesia occupies the sixth position on the rank of non-infectious disease in which the highest prevalence rate belonged to Bangka Belitung (30,9%) then followed by West Kalimantan (29,6%) and West Java (29.4%) (Riskesdas, 2013). Hypertension was in the top ten list of most deadly disease in Special Province of Yogyakarta. In 2009 80% of the mortality rate was caused by Cardiovascular Disease (Dinkes, 2013).

Hypertension is considered as the risk factor of cardiovascular disease



(Mahmudahdkk, 2015). One of disease related to cardiovascular is stroke and chronic kidney disease (Pusdatin, 2015). The worst scenario from this disease is death if it is not well treated (Dinkes P. B., 2014).

Therapy is one of recovery and happiness treatment physically or mentally toward an individual in order to make him/her able to survive and resist the pain (Syukur, 2014). Therapy falls into two types, pharmacological and non-pharmacological one. Some examples of non-pharmacological therapy comprise doing aerobics, using cold or warm compress, listening to relaxing music, inner relaxation breathing, and using aromatic therapy (Misaroh, 2009). Aromatic therapy is a modern term referring to an ancient recovery method using aromatic scent. The aim of this aromatic therapy is to increase the health state and the body wealth in term of mind and soul (Primadiati, 2002). The feeling of sad, emptiness, loosing of interest in doing daily activity are some symptoms of depression that can lead to cardiovascular disease such as hypertension (APA, 2011).

Inner relaxation breath therapy is also included into non-pharmacological one. This therapy is very easy to undergo, economical, and good for daily basis for those who are suffered from hypertension. The purpose of this therapy is to help relaxing the muscles especially vascular muscles in order to keep the arterial blood vessel elasticity (Tawaang, Mulyadi, & Palandeng, 2013). Mutaqin (2009) in Suwardianto (2011) said that inner relaxation breath can stimulate the stretching of blood vessel through the center of cardiovascular regulation to respond the increase of baroreceptor reflex and stimulate the activity of parasympathetic nerve. Hence it can decrease the heart beat and the power of heart contraction which can lead the blood pressure becomes low.

RESEARCH METHODS

This research employed Quasi Experiment Design with Non Equivalent Control Groupas the plan comprising one treatment group and one controlled group. This research used total sampling method. The total respondent was 22 participant.

RESULTS AND DISCUSSION

This research was administered on 2-16 April 2017 in Patukan Gamping Sleman Yogyakarta with elderly respondents. Patukan Village comprises 9 RT and 3 RW.

Table 1. Characteristics of respondent based on physical activity and salt consumption

No	Characteristic	Treatment		Control		
		F	%	F	%	
1.	Sex	Male	4	36,4	3	27,3
		Female	7	64,6	8	72,7
2.	Age	60-64 years old	1	9,1	2	18,2
		65-69 years old	4	36,4	5	45,5
		70-74 years old	4	36,4	2	18,2
		75-79 years old	2	18,2	2	18,2
3.	Body Mass Index	Normal	11	100	11	100
		Total	11	100	11	100

Table 1 shows that the highest number of sex is female, fifteen respondents (68,2%) comprises seven respondents from treatment group and eight respondents from controlled group. Age between 65-69 years old dominates the chart with nine respondents (40,9%) comprises four respondents from treatment group and five from

controlled group. All respondents from both treatment and controlled one groups have normal body mass index.

Table 2. Characteristics of respondents based on physical activities and salt consumption

No	Characteristic	Treatments	
		F	%
1.	Physical activities		
	Morning walk	3	27,3
	Elderly gym every week	2	18,2
	Doing chores (sweeping, mopping, washing, and cooking)	6	54,5
2.	Salt consumption		
	Obedient diet	2	18,2
	Non-obedient diet	9	81,8
	Total	11	100

Table 2 shows that frequency of data distribution based on the activity is dominated by doing the domestic job with six respondents (54,4%). Nine respondents (81,8%) did not undergo the salt diet.

Table 3. The result of wilcoxon test on systolic and diastolic blood pressure of treatment and controlled group April 2017

Groups	Asymp. Sign (2-tailed)		Information
	Blood pressure		
	Systole	Diastole	
Intervention	0,004	0,019	There was meaningful decrease
Control	0,546	0,131	There was no meaningful decrease

Table 3 shows the impact of giving lemon aromatic therapy and inner breath relaxation on both treatment and controlled groups. *P value* of systolic blood pressure in treatment group was 0,004 and the diastolic blood pressure was 0,019. This means that there is impact of giving the lemon aromatic therapy and inner relaxation breath since the $p < 0,05$. Meanwhile, the *p value* of systolic blood pressure on controlled group was 0,546 and the diastolic blood pressure was 0,131 meaning that there was no impact since the $p > 0,05$.

Table 4. Analysis result of Mann-Whitney test of systolic and diastolic blood pressure in intervention group and control group in April 2017.

	Asymp. Sign (2- tailed)		Information
	Blood pressure		
	Systole	diastole	
Intervention and control groups	0,000	There was meaningful decrease	0,016

Primary Data Source (2017)

Table 4 shows the different result of systolic blood pressure and diastolic blood pressure rate on treatment group and controlled group. The mann-whitney statistical test shows that the difference between the post test of the systolic blood pressure in treatment group and controlled group was *p value* 0,000 with the rate of the significance was $< 0,05$. The statistical mann-whitney test showed that *p value* lesser than 0,05 ($0.000 < 0,05$) therefore H_a was accepted. Referring to the statistical test result,

this means that the difference of systolic blood pressure decrease in the post test between treatment and controlled group had significant decrease.

The *p value* result of posttest on diastolic blood pressure in treatment and controlled group was 0,016 and the significance rate was 0,05. The result of mann-whitney statistical test shows that the *p value* was smaller than 0,05 ($0,016 < 0,05$). Hence, it can be concluded that the difference of diastolic blood pressure decrease in the post test between treatment group and controlled group was significant.

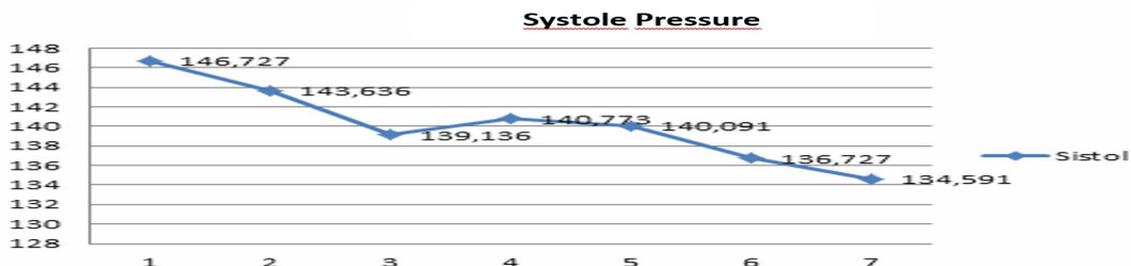


Figure 1. The impact of lemon aromatic therapy and inner relaxation breath toward the decrease of systolic blood pressure in treatment group April 2017

Picture 1 shows the change of systolic blood pressure during the intervention in treatment group. It is clearly seen that from day 1 to day 3 there was a decrease. On day 4 there was an increase from day 3 and on day 5 it gradually decreased up to day 7. Based on picture 1 there was a significant decrease of systolic blood pressure on day 7.

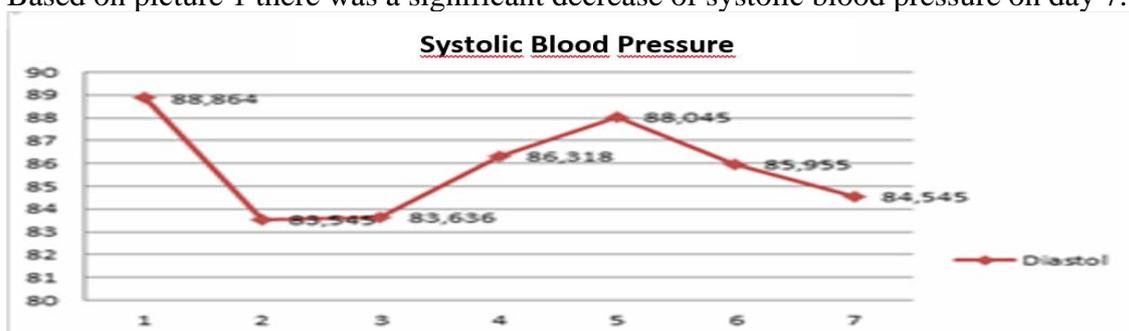


Figure 2. The effect of lemon aromatherapy and breathing relaxation on diastolic blood pressure in the intervention group in April 2017

Based on figure 2, there was a decrease in diastolic blood pressure from day 1 to day 2. From day 1 to day 2, it was relatively stable. From day 2 to day 5, it increased continuously. From day 5 to day 6 and day 7, it gradually decreased. Figure 2 shows a significant decrease in day 2 in the diastolic blood pressure.

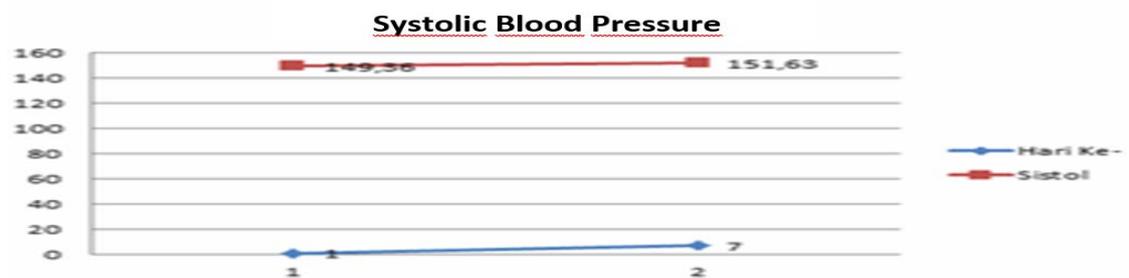


Figure 3. Systolic blood pressure of the control group in April 2017

Figure 3 shows the change of the increase in systolic blood pressure from day

1 to day 7 in the control group.

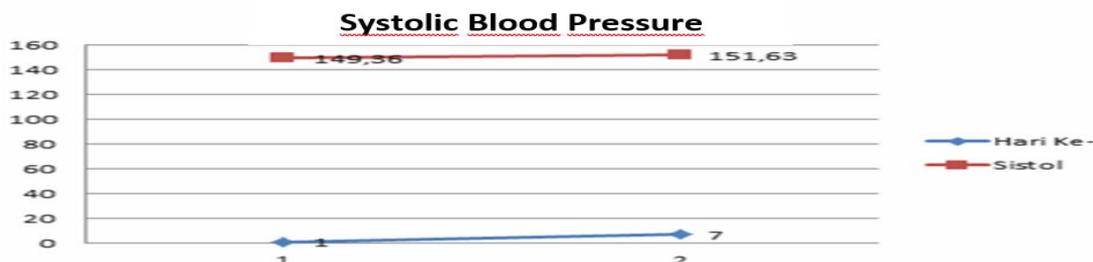
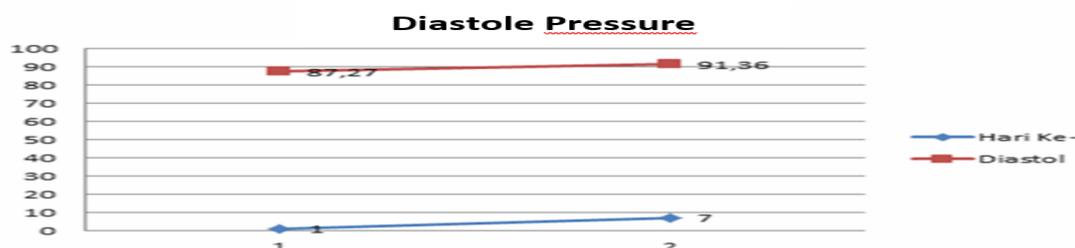


Figure 4. Diastolic blood pressure of the intervention group in April 2017

ased on figure 4, there was an increase of diastolic blood pressure from day 1 to day 7 in the control group.



Decrease in Blood Pressure

Based on table 3, it was found that there was a decrease in blood pressure before and after giving lemon aromatherapy and deep breathing relaxation in hypertensive patients. This happened because there was a significant decrease in blood pressure after giving 2 drops of lemon aromatherapy and deep breathing relaxation with a duration of 10 minutes per day for 7 days. In addition, the results of blood pressure measurements of the respondents showed that there was an effect of lemon aromatherapy and deep breathing relaxation on the decrease in the respondents' systolic and diastolic blood pressure. The provision of lemon aromatherapy and deep breathing relaxation can reduce blood pressure in the respondents because lemon aromatherapy and deep breathing relaxation can provide a relaxed and calm effect so that it can reduce the heart work and decrease blood pressure.

When the aromatic aroma of lemon essential oil is inhaled, volatile molecules will carry the aromatic elements contained like geraniol and linalool to the top of the nose where cilia arise from the receptor cells. If the molecules attach to the cilia, an electro-chemical message will be transmitted through the olfactory tract into the limbic system which will stimulate one's memory and emotional response. The hypothalamus that acts as a regulator raises messages that must be delivered to the brain. The message received is then converted into an action in the form of electrochemical compounds that cause feelings of calm and relaxation and can facilitate blood flow and reduce the heart work (Saputra, 2015).

In addition to lemon aromatherapy, deep breathing relaxation can also affect changes in blood pressure. This is in accordance with Wardani's (2015) statement which suggests that deep breathing is a conscious action to regulate deep breathing carried out by the cerebral cortex with a frequency of 6-10 times per minute. Deep breathing will stimulate nitric oxide that will enter the lungs and even the center of the brain which can make people calmer. This can trigger blood pressure in a high state to decrease.

Nitric oxide is synthesized by the enzyme Nitric Oxide Synthase (eNOS) or endothelial from L-arginine. Nitric oxide is a vasodilator that is important in regulating blood pressure and is released continuously from the endothelium of the arteries and arterioles which can cause shear stress on endothelial cells due to blood viscosity against the vascular wall. The normal stresses that are formed can make the endothelial cells secrete chemical mediators (growth factor, cytokines) which cause proliferation causing an increase in the release of nitric oxide which then cause the blood vessels to relax, to be elastic and to dilate. Relaxing blood vessels will widen so that blood circulation becomes smooth, central venous pressure (CVP) decreases, and the heart work becomes optimal (Wardani, 2015).

A person's systolic blood pressure will vary according to the activity carried out, in contrast to the relatively unchanging diastolic blood pressure as presented in table 4.6. Based on a short interview with 11 respondents of the treatment group, it was found that 11 respondents routinely carried out physical activities, namely 3 of them routinely jogged every morning, 2 of them routinely joined in the elderly gymnastics every week, 6 of them routinely did housework such as sweeping, washing without using the machine and cooking. Routine physical activities can affect the arteries to be more flexible and easy to dilate in order to reduce systolic blood pressure. Based on research conducted by the American College of Cardiology and the American Heart Association, it proves that regular physical activities of at least 2.5 hours in 10 weeks can reduce systolic blood pressure of the elderly by 5 points (Storrs, 2015).

CONCLUSION

Based on research conducted in Patukan Village Gamping Sleman Yogyakarta, it can be concluded as follows:

The blood pressure before being given the lemon aromatherapy and deep breathing relaxation in the intervention group was higher than after being given the lemon aromatherapy and deep breathing relaxation, namely the systolic value of 150.45 mmHg and the diastolic value of 91.81 mmHg. The blood pressure after being given the lemon aromatherapy and deep breathing relaxation in the intervention group was higher than before being given the lemon aromatherapy and deep breathing relaxation, namely the systolic value of 129.84 mmHg and the diastolic value of 82.90 mmHg. The test results using the Wilcoxon analysis obtained the data that the value of Asymp. Sign (2-tailed) for the blood pressure before and after being given the treatment was $0.004 < 0.05$ at systolic blood pressure and $0.019 < 0.05$ at diastolic blood pressure. These results indicated that H_a was accepted by H_0 meaning that there was an effect of lemon aromatherapy and deep breathing relaxation on blood pressure. The blood pressure on day 1 in the control group was lower with the systolic value of 149.36 mmHg and the diastolic value of 87.27 mmHg. The blood pressure on day 7 in the control group was higher with the systolic value of 151.64 mmHg and the diastolic value of 91.36 mmHg. The test results using the Wilcoxon analysis obtained the data that the value of Asymp. Sign (2-tailed) for the blood pressure day 1 and day 7 was $0.546 > 0.05$ at the systolic blood pressure and $0.131 > 0.05$ at the diastolic blood pressure. These results indicated that H_a was rejected by H_0 , meaning that there was no effect of lemon aromatherapy and deep breathing relaxation on the blood pressure in the control group. The results of the analysis test using the Mann-Whitney obtained the data that the value of Asymp. Sign (2-tailed) for the blood pressure of the intervention group and the control group was $0,000 < 0,05$ at the systolic blood pressure and $0,016 < 0,05$ at the diastolic blood

pressure. These results indicated that H_a was accepted by H_o , meaning that there was a significant decrease in the effect of lemon aromatherapy and deep breathing relaxation on blood pressure.

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