

ORIGINAL ARTICLE

Alternative Nostril Breathing On Blood Pressure in the Elderly with Hypertension

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ABSTRACT

Introduction: The chance of hypertension in the elderly people is ranks first in among ten of the most frequent diseases experienced by aged people. Hypertension can be treated both pharmacologically and non-pharmacologically. One of non-pharmacological therapy that can be used for hypertension is nostril breathing because it can balance the activity of the sympathetic nerves and parasympathetic nervous system, so it can stabilize blood pressure. The purpose of this study is to identify whether there is any influence of alternative nostril breathing on blood pressure among the elderly with hypertension. **Methods:** Authors used pre-experimental method with one group pretest posttest approach, in sample of 61 people by using purposive sampling technique. Data collection was performed by measuring blood pressure before and after alternative nostril breathing was performed for 15 days in the morning with duration of 10 minutes. The data analysis used is wilcoxon signed rank test. **Result:** The results showed before taking alternative nostril breathing an average systolic blood pressure of 162.727 mm Hg and diastolic was 97.272 mm Hg, after taking alternative nostril breathing an average systolic blood pressure was 151.818 mm Hg and diastolic 86.363 mm Hg. Wilcoxon signed rank test result obtained p value of systolic blood pressure 0.036 and p value of diastolic blood pressure was 0.03 ($\alpha = 0.05$). We found that there is an effect of alternative nostril breathing on blood pressure values in the elderly with hypertension. **Conclusion:** It can be concluded that alternative nostril breathing can be used as one of those alternatives handling to lower blood pressure in hypertensive patients.

Keywords: Alternative nostril breathing, Blood pressure, Hypertension

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INTRODUCTION

The more we age, the more likely a person is experiencing physical, mental, spiritual, economic, and social problems. One very basic problem is a health problem due to the degenerative process. Based on data from the Basic Health Research show that among the elderly hypertension is a very common disease (1). Hypertension can cause kidney failure, coronary heart disease, and stroke if not detected early and treated adequately (2). Therefore, it is necessary to manage hypertension both pharmacologically and non-pharmacologically. It is undeniable that drugs are a type of poison that which after a certain limits can be harmful and have a negative impact on the human body if used for a long time. Pharmacological therapy is needed but nonpharmacological therapy is preferred because based on many studies it is believed to be safer and has a positive effect (3).

Breathing relaxation is one of the nurses' independent actions in the prevention and treatment of hypertension which is quite practical and cost-effective, compared to the cost of treating hypertension through pharmacology (4). To decrease the blood pressure, alternate nostril breathing is very good exercising (5). Breathing through the right nostril will increase sympathetic activity while breathing with the left nostril will decrease sympathetic activity and increase parasympathetic activity. Therefore, alternate nostril breathing can balance the activity of sympathetic and parasympathetic nerves, so it stabilize blood pressure (6).

Previous research conducted by Sharma (2013), shows that alternate nostril breathing is effective for reducing high blood pressure. This research was conducted on 30 people and carried out for 30 days every morning. The results showed the average level of blood pressure before the intervention was 144.3 mmHg systole and after the intervention was 137 mmHg, while the average value of diastole before the intervention was 93 mmHg and after the intervention was 87.5 mmHg (7). Furthermore, research conducted by Dileep & Doss (2016) shows that alternate nostril breathing can help reduce high blood

pressure in hypertensive patients. This research was conducted involving 40 respondents conducted for 15 days (8).

Based on the results of a preliminary study, it was found that the Cipadung Community Health Centre held 2 villages, namely Cipadung and Palasari. In Cipadung and Palasari there are health activities held by health centre every month with existing programs including health check-up, elderly gymnastics and health counselling. The results of blood pressure checks conducted in health centre in July 2019 obtained data that the elderly who have high blood pressure in Cipadung were 61 people while in Palasari there were 53 people. Based on preliminary studies, hypertensive elderly say they have never tried alternative treatments or relaxation; they only take drugs given by the health centre and routinely check blood pressure (9). Based on the description in the background above, the author is interested in the present study.

MATERIALS AND METHODS

The method used in this study is One Group Pretest-Posttest design. The population in this study was 61 elderly with hypertension who went to Health centre in Cipadung Village. While the sample selected in this study uses a purposive sampling technique with criteria for elderly aged 55 to 69 years, who can hear and see, not experiencing respiratory system disorders, blood pressure > 145/95 mmHg for men and > 160/95 mmHg for women, willing to be respondents and follow the research procedure until the final stage, not eating, drinking coffee, drinking tea one hour before doing alternate nostril breathing.

The instruments in this study was a tool to measure blood pressure in the form of aneroid sphygmomanometer, stethoscope and observation notes to document the results of blood pressure measurements in the old person before and after alternative respiratory nostril breathing. Data collection was done by measuring blood pressure before and after alternative nostril breathing conducted for 15 days in the morning with duration of 10 minutes. Data analysis using Wilcoxon signed-rank test because based on the results of the normality test using Shapiro Wilk obtained P-value <0.05 which means the data is not normally distributed.

The present research study has been approved by Health Research Ethics Committee Sekolah Tinggi ILMU, Institute of Health Science Bhakti Kencana Bandung, Indonesia vide Ref No.251/LPPM-STIKES BK/E/IV/2019 dated 15th April 2019.

RESULTS

Table I shows that the majority (63.6%) of elderly patients with hypertension are female and the majority

Table I: Characteristics of the Elderly Conducting Alternative Nostril Breathing in the Cipadung Community Health Center in Bandung

| Characteristics | Frequencies f | Percentage % |
|-------------------|------------------|-----------------|
| Gender | | |
| Male | 4 | 36.4 % |
| Female | 7 | 63.6 % |
| Total | 11 | 100% |
| Age | | |
| Age 55-64 | 6 | 54.5 % |
| Age 65-69 | 5 | 45.5 % |
| 70 years and over | 0 | 0 |
| Total | 11 | 100% |

Table II: Blood Pressure Values in the Elderly with Hypertension before performing alternative nostril breathing in the Cipadung Community Health Centre in Bandung

| Blood Pressure Value | F | Percentage | Mean |
|----------------------|----|------------|-------------------|
| 150/90 mmHg | 1 | 9.1% | Systolic 162 mmHg |
| 160/90 mmHg | 3 | 27.3% | |
| 160/100 mmHg | 4 | 36.4% | |
| 170/100 mmHg | 1 | 9.1% | Diastolic 97 mmHg |
| 170/110 mmHg | 1 | 9.1% | |
| 180/100 mmHg | 1 | 9.1% | |
| Total | 11 | 100 % | |

(54.5%) are aged 55-64 years.

Table II shows the average value of systolic and diastolic blood pressure before performing alternative nostril breathing is 162 mmHg and 97mmHg for systolic and diastolic blood pressure respectively.

Table III: Blood Pressure Values in the Elderly with Hypertension after performing alternative nostril breathing in the Cipadung Community Health Centre in Bandung

| Blood Pressure Value | F | Percentage | Mean |
|----------------------|----|------------|-------------------|
| 140/80 mmHg | 2 | 18.2% | Systolic 151 mmHg |
| 140/90 mmHg | 1 | 9.1% | |
| 150/80 mmHg | 2 | 18.2% | |
| 150/90 mmHg | 2 | 18.2% | Diastolic 86 mmHg |
| 160/90 mmHg | 1 | 9.1% | |
| 170/80 mmHg | 1 | 9.1% | |
| 170/90 mmHg | 1 | 9.1% | |
| Total | 11 | 9.1% | |

It can be seen that after performing alternative nostril breathing a small proportion (18.2%) of the elderly have blood pressure values of 140/80 mmHg, 150/80 mmHg, 150/90 mmHg. The average value of systolic and diastolic blood pressure after performing alternative nostril breathing is 151 mmHg and 86 mmHg for systolic and diastolic blood pressure respectively (Table III).

Table IV shows that there is an effect of alternate nostril breathing on systolic blood pressure (0.036, p <0.05). There is also an effect of alternative respiratory nostril

Table IV: Effect of Alternate Nostril Breathing on Blood Pressure Values in the Elderly with Hypertension in the Cipadung Community Health Center in Bandung

| Data | | Mean | Difference | Median | Std.deviasin | Z count | Z table | P value | α |
|-----------|--------|----------|------------|--------|--------------|---------|---------|---------|----------|
| Systolic | Before | 162 mmHg | 111 mmHg | 160 | 7.8 | -2.101 | -1.96 | 0.036 | 0.05 |
| | After | 151 mmHg | | 150 | 10.7 | | | | |
| Diastolic | Before | 97 mmHg | 11 mmHg | 100 | 6.4 | -2.972 | | 0.003 | |
| | After | 86 mmHg | | 90 | 6.7 | | | | |

breathing on diastolic blood pressure (0.003, $p < 0.05$).

DISCUSSION

In this study, hypertension occurs due to the aging process. The results indicate that the majority (54.5%) of respondents were in the 55-64 years age category. According to Potter & Perry (2009)(10) blood pressure in adults will increase with age. The elderly usually experience an increase in systolic blood pressure associated with decreased elasticity of blood vessels. Primary hypertension usually appears between the ages of 30-50 years. The incidence of hypertension increases with age and 50-60% of clients over the age of 60 years having blood pressure more than 140/90 mmHg. Isolated systolic hypertension generally occurs in people over 50 years of age with almost 24% of all affected by age 80 years (11). This is because increasing age can cause hormonal changes and changes in the vascular activity. In addition to the decreasing elasticity of arteries, blood vessels also become stiff, so that the arteries cannot expand when the heart is pumping blood and blood flow is not smooth (12). This is consistent with research conducted by Siringoringo, et al (2013) which states that the proportion of hypertension in the 45-59 years age group is 54.72%, in the 60-74 years age group as many as 74.57%, and in the 75-90 years age group is as much as 64.29% (13).

In this study the majority (63.6%) of women had hypertension. The risk in men and women suffering from hypertension is almost the same between the ages of 55-74 years (11). Whereas in this study we see that hypertension is seen more among women, especially after menopause due to the influence of the hormone estrogen. According to the research menopause causes unstable blood flow that will result in a decrease in HDL and an increase in LDL which is a major risk factor of heart disease (14). Low levels of HDL cholesterol and high LDL cholesterol affect the process of atherosclerosis and cause high blood pressure (15). From another research indicate that 27.5% of women experience hypertension, while only 5.8% of men experience hypertension. Alternative nostril breathing in addition to providing a very calming effect for the body can also balance the activity of the sympathetic nerves and the sympathizers; this can later stabilize blood pressure (16).

According to another researcher alternative nostril breathing has a positive impact on preventing the cardiovascular disease(17). Another study states that alternate nostril breathing given for 15 days can help reduce blood pressure in hypertensive patients (8). In this study systolic and diastolic blood pressure was decreased where the value of P-value $< \alpha$ (0.001 < 0.05). This is supported by the results of the study which showed that the majority (63.63%) of elderly blood pressure decreased after alternative nostril breathing. The cause of the persistence of blood pressure values that increase and remain after performing alternative nostril breathing is due to other risk factors that affect the uncontrolled sodium consumption, diabetes, and stress. Sodium consumption can be an important factor in the development of essential hypertension. At least 40% of respondents who end up with hypertension will be sensitive to salt and excess salt may be the cause of hypertension triggers, high-salt diets may cause excessive release of the natriuretic hormone, which may indirectly increase blood pressure (11).

Diabetes accelerates atherosclerosis and causes hypertension due to damage to large blood vessels. Therefore, hypertension will be a common diagnosis in diabetes, even though diabetes is well controlled. If a diabetic client is diagnosed with hypertension, treatment, decisions and follow-up care should be truly individual and aggressive (11). Stress increases peripheral vascular resistance and flow which in turn stimulates sympathetic nervous system activity. Dangerous stimuli that are considered by someone as a threat or can cause danger; then a psychopathological response "fight or flight" is initiated in the body. If the stress response becomes excessive or prolonged, target organ dysfunction or disease will result (11). The influence of alternate nostril breathing on blood pressure values among the elderly with hypertension is due to balanced sympathetic and parasympathetic nerve activity. This is because when we breathe through left nostril, it will activate the sympathetic nervous system and when through right nostril, it will activate the parasympathetic nervous system and by this way body get relaxation. This is consistent with the theory put forward by Koban et al (2013) that the mechanism of reducing blood pressure by performing alternative nostril breathing is very complex. In alternate nostril breathing, there is a significant relationship between

the nasal cycle, cerebral dominance, and autonomic activity (4). This nasal cycle is associated with cerebral dominance.

Previous research also mentioned that alternate nostril breathing is a good tool for managing blood pressure. This research was conducted for 30 days every morning. The results showed the average value of blood pressure before the intervention was 144.3 mmHg systole and after the intervention was 137 mmHg, while the average value of diastole before the intervention was 93 mmHg and after the intervention was 87.5 mmHg (7).

CONCLUSION

According to the research result, it can be concluded that there is an influence of alternate nostril breathing on the value of blood pressure in the elderly with hypertension in the working area of Cipadung health centre, Bandung. Therefore hypertension can be reduced by performing simple alternate nostril breathing regularly. This exercise does not need any special equipment and major training to patients. So, this kind non-pharmacological therapy will help to reduce stress among elderly, improve cardiovascular function and respiratory function.

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