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THE EFFECT OF THE BRISK WALKING ACTIVITY THERAPY METHOD ON BLOOD PRESSURE REDUCTION IN HYPERTENSIVE PATIENTS

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ABSTRACT

Hypertension is one of the diseases that often causes various negative effects for sufferers. Uncontrolled hypertension can impair quality of life and interfere with daily activities. It can also harm other organs, including the kidneys, heart, brain, and eyes. Medication can rapidly reduce high blood pressure, but long-term use can have negative effects, such as renal damage. Therefore, using a non-pharmacological method is a simple, affordable, and safe to control blood pressure. Non-pharmacological interventions like the BRAT method can be an aid intervention. This study aims to identify the effectiveness of the BRAT method in reducing blood pressure in patients with hypertension. This study used an experimental research design with a pretest-posttest control group approach. By considering alpha value 0,05, power 80%, and effect size 0,713, G*power analysis was implemented to determine the patients; thus, it was found that 64 patients with hypertension were divided into two groups (each 32 patients). A digital sphygmomanometer was used to measure blood pressure before and after 12 BRAT technique applications. The data was analyzed using the t-test. The results showed that the average systolic blood pressure of hypertensive patients in the intervention group is 144.97 mmHg and the control group is 148.09 mmHg; there is a significant difference (p-value 0.000) between the systolic and diastolic blood pressure readings before and after the Brisk Walking Activity Therapy (BRAT) approach was implemented. It can be concluded that the BRAT method effectively reduces blood pressure in patients with hypertension. This intervention can be an option for patients with hypertension who want to reduce their blood pressure non-pharmacologically.

Kata Kunci:

Tekanan Darah;
Terapi Brisk Walking Activity;
Hipertensi

ABSTRAK

*Hipertensi merupakan salah satu penyakit yang sering menimbulkan berbagai efek negatif bagi penderitanya. Hipertensi yang tidak terkontrol dapat mengganggu aktifitas sehari-hari dan menurunkan kualitas hidup, selain itu penimgkatan tekanan darah yang tidak terkontrol juga dapat merusak organ lain seperti ginjal, jantung, otak dan mata. Tekanan darah tinggi dapat diturunkan secara cepat menggunakan obat-obatan, namun apabila dikonsumsi jangka panjang maka dapat menimbulkan efek samping terhadap kerusakan ginjal, sehingga salah satu cara pengendalian tekanan darah secara aman, murah dan mudah dapat dilakukan dengan menggunakan pendekatan nonfarmakologi. Intervensi non-farmakologis seperti metode BRAT dapat menjadi salah intervensi yang telah direkomendasikan untuk dapat menurunkan tekanan darah. Penelitian ini bertujuan untuk menilai efektifitas metode BRAT dalam menurunkan tekanan darah pada pasien hipertensi. Studi ini menggunakan desain penelitian eksperimental dengan pendekatan pretest-posttest with control group. Penentuan responden dilakukan menggunakan bantuan analisa G*Power dengan pertimbangan nilai alpha sebesar 0,05, power 80%, dan effect size 0,713 sehinga didapatkan 64 responden yang dibagi menjadi dua kelompok (@ 32 orang). Pengumpulan data berupa nilai tekanan darah di ukur menggunakan spigmomanometer digital baik sebelum dan setelah 12 kali penerapan metode BRAT. Analisa data dilakukan dengan menggunakan uji t. Hasil penelitian menunjukkan bahwa rata-rata tekanan darah sistolik pasien hipertensi di kelompok intervensi adalah 144,97 mmHg dan kelompok kontrol adalah 148,09 mmHg, terdapat perbedaan signifikan (nilai p 0,000) antara tekanan darah sistolik dan diastolik sebelum dan sesudah pendekatan terapi BRAT. Dapat disimpulkan bahwa metode BRAT efektif dalam menurunkan tekanan darah pada pasien hipertensi. Intervensi ini dapat menjadi pilihan bagi pasien hipertensi yang ingin menurunkan tekanan darah secara non-farmakologis.*

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INTRODUCTION

Hypertension is one of the risk factors for cardiovascular disease (Rahmayati, Rahmi, and Ilbert, 2023). Because hypertension does not give symptoms to the patient, it is often referred to as a silent killer. The global target for hypertension is to reduce its prevalence by 33% by the year 2030. According to the 2021 report, over half of American people (48.1%) had hypertension, with half of those affected having blood pressure levels more than 140/90 mmHg. Moreover, 1.28 billion adults (ages 30-79) worldwide are expected to have hypertension in 2023; a large proportion of these individuals are predicted to originate from low- to middle-income families (CDC, 2023; WHO, 2023a).

Based on data from the Basic Health Research Statistics (Riskesdas), hypertension prevalence in Indonesia is very worrying, from 25.8% in 2013, increased to 34.1% in 2018, where 31.3% of patients are men and 36.8% are women. It is also well known that hypertension is more common in the elderly, and only one out of every three hypertensive individuals seeks regular therapy (Kemenkes RI, 2018). Nearly 500,000 instances of hypertension (38.29%) have been reported in Aceh Province alone, spanning all districts and cities. Langsa City has the greatest frequency (86.98%), while Aceh Singkil District has the lowest (2.07%). Meanwhile, 69% of people in the Greater Aceh region do not use health services, and 49.04% of people there have hypertension (Dinkes Aceh, 2022).

Symptoms like headache, dizziness, restlessness, and stiff neck might all indicate elevated blood pressure (Adrianto, 2023). An increase in blood pressure can lead to various effects for those affected. Excessive blood pressure can harden the arteries, resulting in reduced blood and oxygen flow to the heart. This can cause chest pain, heart attacks, heart failure, and arrhythmias. A stroke can also be brought on by hypertension, which can burst blood vessels or obstruct arteries that provide oxygen and blood to the brain. Furthermore, critical organs, including the heart, brain, kidneys, and eyes, can sustain harm from hypertension (WHO, 2023b).

Controlling blood pressure can help prevent the problems of hypertension. One way to achieve this is by utilizing the "BRAT" approach, a pharmaceutical therapy. The author created the acronym BRAT, which stands for Brisk Walking Activity Therapy. According to the European and American Hypertension Guidelines, BRAT is a type of aerobic exercise that helps lower blood pressure while promoting calmness. For patients with primary hypertension, BRAT is one of the supplemental therapies available. Doing this workout three to five times a week for 20 to 30 minutes at an average pace of 4-6 km/h can be beneficial (Nirnasari, Wati and Setiawati, 2021; Dewi *et al.*, 2022; Agustina *et al.*, 2025).

Given its ability to induce muscular contractions, elevate heart rate, accelerate the breakdown of glycogen, and boost tissue oxygen delivery, BRAT is thought to be fairly effective in reducing blood pressure. Additionally, by increasing the metabolism of fats and carbs, this exercise can help to ward off atherosclerosis in the blood vessels (Zaen and Sinaga, 2020; Rahmayati, Rahmi, and Ilbert, 2023). Brisk walking exercise can significantly reduce blood pressure in people with hypertension (Malem, Ristiani, and Puteh, 2024), so that the risks of complications related to hypertension can be managed properly (Anggraeni and Trisnawati, 2025).

According to Dewi, Hapsari, and Khotimah's 2022 study, which used a quasi-experimental design with a non-equivalent control group design with 34 respondents divided into two groups, brisk walking exercise affects blood pressure in hypertensive patients. Muslim, Anri, and Suprapti accomplished similar results, showing that brisk walking exercise can cause changes in blood pressure in 2023, with 65 respondents using a quasi-experimental design with a pretest-posttest technique. The more regularly this brisk walking activity is conducted, the more likely it is to lower blood pressure in people with hypertension (Sonhaji, S.Hapsari and Khotimah, 2020; Dewi *et al.*, 2022; Muslim, Anri and Suprapti, 2023).

A preliminary study in the Baitussalam Health Center area discovered a considerable decline in hypertension patients over the previous two years, from 1,017 in 2021 to 589 in 2022. According to the data acquired from the interviews, four among five hypertensive patients reported using antihypertensive medication

on a regular basis to keep their blood pressure under control. They also stated that they had begun a hypertensive diet and go for regular morning walks after the 'subuh' (dawn) prayers. Their concern of suffering a stroke at any point makes them determined to overcome their hypertension. Regarding the application of non-pharmacological treatment, they stated that while it is good to know that some beverages, such as starfruit juice, may naturally decrease blood pressure, they are concerned about the potential negative implications, such as increased stomach acid levels.

The findings also presented that people are unaware of the benefits of regular, dynamic walking for blood pressure control. During the primary data collection, it was determined that Gampong Blang Krueng is the primary source of hypertensive patients seeking treatment at the community health centre.

The above description, "The effectiveness of Brisk Walking Activity Therapy (BRAT) in Lowering Blood Pressure among patients with hypertension," demonstrates the authors' interest in conducting research. The purpose of this study is to determine the efficacy of the BRAT approach in lowering blood pressure, with the goal of using it as a non-pharmacological therapy to lower and control blood pressure in hypertensive patients.

METHOD

Type of Research

This research is an experimental study employing a two-group approach with a pretest-posttest design. The traditional experimental design is typically characterized as a two-group pretest design. Participants are assigned at random to either the intervention-receiving experimental group (Schmidt and Brown, 2020). The BRAT Method is the independent variable in this study design, and blood pressure is the dependent variable.

Place and Time of Research

This Research was conducted from July to August 2024 in the Aceh Besar area, Nangroe Aceh Darussalam Province

Population and Sample

Patients with hypertension in the Baitussalam subdistrict of Aceh Besar comprised the study's population. Determining the sample size in this study used power analysis (G*Power 3.1 software), considering an alpha value of 0.05, a power of 80%, and the effect size. The calculation of the effect size was based on the research by Ali *et al* (2023), resulting in an effect size of 0.713 and a total sample size of 64 individuals, divided into 2 groups with 32 individuals in each intervention and control group.

The research sample was selected based on the following inclusion criteria: 1) willing to be a research respondent, 2) having abnormal blood pressure (above 120/80 mmHg), 3) being able to walk or not experiencing weakness in the limbs, and 4) having no contraindications for undergoing BRAT or meeting the readiness criteria to participate in physical activities based on the Physical Activity Readiness Questionnaire. (PAR-Q). This research has been approved by the research ethics review with code 113053110624.

The intervention group received therapy for a period of four weeks, during which time BRAT exercises were performed three times a week for thirty to sixty minutes each time. Brisk walking was conducted once in two days. The BRAT exercises were designed to be longer than the core exercises by a daily increment, with a warm-up and cool-down of ten minutes each.

Data Collection

This study used a sphygmomanometer to measure the data. Measurements were taken twice: once after agreement to participate (pretest/ before treatment) and again a month later, or after the intervention was administered twelve times (24 hours after the last treatment). The researchers also gathered demographic information, including age, gender, BMI, history of hypertension, and blood pressure.

Data Analysis and Processing

The average score for each study component is determined and then displayed in a frequency distribution as part of the grouping process. The statistical test used to evaluate the BRAT method's efficacy in reducing blood pressure was the paired T-test because it was conducted on 2 paired samples.

RESULT

Table 1. Frequency distribution of respondents' demographics (N=32)

Variable	Intervention group		Control group	
	f	%	f	%
age				
Adult	23	71,9	19	59,4
Elderly	9	28,2	13	40,6
Gender				
Man	12	37,5	9	28,1
Woman	20	62,5	23	71,9
BMI				
Underweight	4	12,5	1	3,12
Optimal	12	37,5	11	34,38
overweight	14	43,8	15	46,88
Obese class	2	6,2	5	15,62
History of Hypertension				
< 5 years	12	37,50	14	43,75
>5 years	20	62,50	18	56,25

According to Table 1 above, the majority of individuals with hypertension in the intervention group are older (46.9%), female (68.8%), obese (43.8%), and have had hypertension for more than five years (62.50%). In contrast, those with hypertension in the control group are more likely to be older (40.6%), female (71.9%), obese (46.88%), and have a history of hypertension lasting longer than five years (56.25%).

Table 2. Blood pressure before and after the application of the BRAT method

Group	Variable	Pretest		Posttest	
		Mean	St.Deviasi	Mean	St. Deviasi
Intervention	Sistole	144,97	10,98	127,91	12,44
	Diastole	93,84	11,23	79,47	8,77
control	Sistole	148,09	13,192	147,12	12,197
	Diastole	92,38	3,816	88,28	6,487

The data show that the average systolic blood pressure of hypertensive patients in the intervention group is 144.97 mmHg, while the average blood pressure in the control group is 148.09 mmHg.

Table 3. The difference in blood pressure before and after the application of the BRAT method

Variable	Group	Mean	St. Deviasi	P-Value	N
Sistolic	Intervention	127,91	12,44	0,000	32
	Control	147,12	12.19		32
Diastolic	Intervention	79,47	8,77	0,000	32
	Control	88,28	6,49		32

The data show that there is a significant difference (p-value of 0.000) between the systolic and diastolic blood pressure readings before and after the Brisk Walking Activity Therapy (BRAT) approach was implemented.

DISCUSSION

The pretest results showed systolic and diastolic blood pressure readings of 145/94 mmHg for the intervention group and 148/92 mmHg for the control group. According to Vemu, Yang, and Ebinger (2024), hypertension occurs when systolic blood pressure surpasses 140 mmHg and diastolic blood pressure exceeds 90 mmHg. Furthermore, Angraeni and Trisnawati (2025) discovered in their study that the average systolic pressure before the treatment in patients was 162.07, and the diastolic value was 107.7.

Walking faster than normal is a technique employed in the Brisk Walking Activity Therapy (BRAT) technique. BRAT is a non-pharmacological method of treating hypertension that may be used alone or in groups, is simple and inexpensive to implement, and has no harmful side effects on the body. According to the study's findings, patients with hypertension can effectively drop their blood pressure by employing Brisk Walking Activity Therapy (BRAT). The findings of this study are consistent with those of E.Astuti, Suryani, and Andriyani (2020), who found reductions in systolic and diastolic blood pressure after three sessions of brisk walking treatment, with additional sessions also having a blood pressure-lowering effect.

Sonhaji, S.Hapsari and Khotimah in 2020, who found reductions in systolic and diastolic blood pressure after three sessions of brisk walking treatment, with additional sessions also having a blood pressure-lowering effect. Furthermore, Prajayanti and Septiana (2023) discovered in their study that quick walking activities can help hypertensive patients reduce their blood pressure.

According to the study's findings, the intervention group's average blood pressure changed by 17.06 mmHg before and after the BRAT strategy was adopted, compared to 0.97 mmHg for the control group. Meanwhile, diastolic blood pressure fell by 14.37 mmHg in the intervention group and 4.1 mmHg in the control group. This indicates that the BRAT approach, when followed regularly, can assist in lowering blood pressure.

The BRAT approach is assumed to progressively restore normal cardiac function by increasing the flexibility of blood arteries and improving blood flow, resulting in more effective oxygen distribution throughout the body. Furthermore, regular use of the BRAT approach can benefit the heart function more efficiently, resulting in a reduction in cardiac output followed by a drop in blood pressure. This occurs when the body's vasopressin and sympathetic activity levels drop.

The claim that organized walking can improve fitness validates this. Walking for a minimum of 20 minutes, two to three times per week, at a greater intensity can aid in lowering blood pressure by strengthening muscles, burning fat, and improving blood vessel flexibility. Hospital (2024) and Lesnusssa (2024) mention that brisk walking as a physical activity can provide a variety of benefits, including increased blood vessel flexibility and improved cardiac function.

Moreover, Muslim, Anri, and Suprapti (2023) indicate that the supply of oxygen to the brain and heart increases when the leg muscles strengthen during walking, resulting in smoother blood flow between the muscles. The blood flow transports the fuel substances that control muscle contractions, specifically oxygen and glucose. Walking for a few dozen minutes can stretch the nerves, re-establish hormone function, and reset neurotransmitter effectiveness in regulating blood pressure.

BRAT also affects cardiac output, causing structural adaptation of the ventricles and an increase in ventricular volume. The enlarged ventricular volume will expand the stroke volume, reducing the effort of pumping blood throughout the body. As the heart valve performance improves, the attained blood flow objective can reduce pulse pressure (Telasih, 2019).

BRAT is thought to be quite helpful at lowering blood pressure because it stimulates muscle contractions, increases heart rate and glycogen breakdown, and delivers more oxygen to the tissues. This exercise can help improve lipid and carbohydrate metabolism, reducing the risk of blood vessel atherosclerosis (Mulia, Istiana and Nur Sukma Purqoti, 2020; Zaen and Sinaga, 2020; Rahmayati, Rahmi and Ilbert, 2023).

Following the application of the BRAT approach, hypertension patients' average blood pressure did not exceed the normal range of 120/80 mmHg. In fact, the BRAT approach was unable to reduce blood pressure to a normal level in less than 4 weeks of implementation. As this study shows, the BRAT method is regarded to be

highly successful in decreasing blood pressure at both the systolic and diastolic levels. As a result, the researchers believe that when provided consistently and frequently, BRAT can help hypertensive individuals recover to normal blood pressure. According to Esni et al. (2024), the Brisk Walking Exercise technique for hypertensive patients is a method that can help reduce high blood pressure; for this reason, respondents were able to do the Brisk Walking Exercise to maintain a healthy lifestyle and maintain stable blood pressure.

The study's findings revealed disparities in blood pressure lowering among responders. This is due to a number of factors that influence the BRAT method's ability to lower blood pressure in each individual, including age, gender, anthropometric status, duration of hypertension, lifestyle, and medication use.

Age is one of the parameters that influences the success of blood pressure lowering with the BRAT approach. According to the research findings, the majority of respondents in this study are adults, with 71% in the intervention group and 59.4% in the control group. Adulthood is the age at which a person is regarded as physically and psychologically mature, making it easier to accept life-supporting information, particularly in terms of health improvement. They are also seen to be more prepared and capable of implementing BRAT because they have no limits or susceptibilities in their limbs, unlike the elderly. These respondents' readiness and willingness to use the BRAT method as part of their daily regular activities have a significant impact on its adoption.

Individuals' anthropometric status influences the ease or difficulty with which they can reduce their blood pressure. According to the study's findings, the majority of respondents in both groups were overweight. A person's body grows in proportion to the blood required to deliver oxygen and nutrients to the muscles and other tissues. This causes an increase in cardiac output in overweight people.

Overweight can induce hypertension in two ways: directly or indirectly. Directly, a rise in body weight over normal can boost cardiac output, allowing the blood to give oxygen and nutrients to all cells in the body. Furthermore, being overweight might raise vascular resistance, which leads to elevated blood pressure. This is exacerbated by elevated body lipids, which produce substances that injure the heart and blood vessels. Overweight is produced indirectly by cytokines, hormones, and adipokines that stimulate the sympathetic nervous system and the Renin Angiotensin Aldosterone System (RAAS). The hormone aldosterone is closely linked to water and sodium retention, which can increase blood volume (Imamah, Prasetyowati, and Antika, 2023).

CONCLUSION AND SUGGESTION

Patients with hypertension can effectively drop their blood pressure by using the BRAT approach. The blood pressure differences in both groups before and after the BRAT method were applied provide evidence. The length of hypertension, age, gender, anthropometric status, and dietary adherence all have an impact on how well the BRAT technique lowers blood pressure.

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