Research Article

THE EFFECT OF TAI CHI EXERCISE ON LOWERING BLOOD PRESSURE IN HYPERTENSIVE PATIENTS IN AWANG BANGKAL BARAT VILLAGE

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ABSTRACT

Hypertension is a silent killer characterized by blood pressure exceeding 140/90mmHg and causing complications such as kidney failure, stroke, heart failure, and dementia. Based on data from UPT Puskesmas Karang Intan 2, hypertension is one of the 10 most common diseases in Awang Bangkal Barat Village, Karang Intan Subdistrict, due to the unhealthy diet of the community. This study aims to determine the effect of Tai Chi exercises on lowering blood pressure in hypertensive patients in Awang Bangkal Barat village using a case study method with an analytic descriptive approach, pre-test, and post-test. Tai Chi exercises were carried out 3x/week for 2 weeks with 5 minutes of warm-up, 27 minutes of core movements, and 3 minutes of cooling down. Blood pressure measurements were taken before and 15 minutes after the exercise. After doing Tai Chi exercises for 6 meetings for 2 weeks, there was a decrease in average systolic blood pressure by 14.5 mmHg and diastolic blood pressure by 4.5 mmHg. In addition, there was a decrease in the average pulse rate of 7x/minute. Therefore, Tai Chi exercise therapy is effective in helping to reduce blood pressure in hypertensive patients.

Keywords: Hypertension, Blood Pressure, Tai Chi Exercises

Introduction

Hypertension is a rise in arterial blood pressure greater than 140/90 mmHg and is associated with some comorbidities (Ammara Batool et al., 2018). Hypertension occurs due to several factors, such as age, gender, genetics, obesity, smoking, stress, unhealthy diet, and lack of physical activity (Made, 2017).

WHO (2019) estimates that there are 1.13 billion hypertensive people worldwide, and most of them (about 66%) live in developing countries with low to moderate income. This figure is expected to continue to increase by 29% by 2025. Riskesdas in Awaluddin (2020) states that hypertension in Indonesia will continue to increase from 26.5% to 34.1% in 2018. From this data, it is known that 8.8% of sufferers take medication, 13.3% of sufferers do not take medication, and 12% of sufferers do not regularly take medication. This happens because people feel healthy, so they don't feel the need to get treatment. Data from the South Kalimantan Provincial Health Office (2021) shows that the rate of hypertension in people over 18 years of age is 44.13% and is ranked as the first most common disease of the 10 NCDs in Banjar Regency with a total of 1,073,723 people. According to UPT Puskesmas Karang Intan 2 data, 54 people (13.7%) had hypertension, the third most common disease in the last 3 months (September 2023). Meanwhile, data from Posbindu and sub-primary Puskesmas in Awang Bangkal Barat Village showed that 12 people (43%) had hypertension out of 28 people who visited. The assessment results on October 31 - November 4, 2023, of Awang Bangkal Barat Village residents from RT 1 - RT 7 found that the most common disease suffered by residents was hypertension, with 460 people (25%), 450 adults and 10 older people.

Awang Bangkal Barat Village is one of the wetland areas with fertile soil, so it is widely used for farming (vegetables and fruits). Residents often use These plants and trees to be consumed together in large quantities, one of which is durian fruit. Durian fruit is usually consumed directly or processed into various kinds of food. In addition, most residents also consume processed fish fermented using salt (wadi). This food is often consumed during gotong royong activities, weddings, or other cultural events in the village. The fermented fish with salt contains a lot of sodium, which,

when consumed, will cause the body to retain water at a level exceeding the standard body limit, which can increase blood volume and cause blood pressure to increase (Fitri & Ananda, 2022). In addition, some residents have poor sleep patterns and lack physical exercise. Hypertension can occur due to excessive food consumption without balanced physical activity (Putriastuti, 2016).

Hypertension causes endothelial damage and accelerates atherosclerosis, resulting in cerebrovascular disease (stroke or transient is-chemical attack) and coronary artery disease (myocardial infarction or angina, kidney failure, dementia, and atrial fibrillation). The risk of hypertension will be even greater if there are cardiovascular risk factors in the patient's body that have an impact on increasing the mortality and morbidity rates of hypertensive patients (Ansari, 2020). The management of hypertension can be done by carrying out supporting therapies such as regular isotonic exercise to lower blood pressure (Fandinata et al., 2020).

Tai Chi exercise is known as moving meditation or meditation in action because it is an isotonic sport that integrates breathing, thoughts, and physical motions into one cohesive unit (Fandinata et al., 2020). Tai Chi workouts that involve slow movements, deep breathing, and mental focus can help people relax by increasing blood oxygen concentration, smoothing blood flow, and lowering heart rate (Emilyani et al., 2023). Tai chi exercises have been shown to enhance blood vessel and respiratory tract function, combat chronic illnesses, boost vitality, stamina, and agility, enhance general health, alleviate insomnia, and reduce stress (Sulistiya, 2021). Therefore, in addition to lowering blood pressure, Tai Chi exercises can also be used to relax, maintain physical and mental balance, and reduce anxiety (Riska, 2018). The author intends to determine the effect of Tai Chi activities in reducing blood pressure in hypertensive patients in Awang Bangkal Barat village based on the data obtained.

Methods

The method used is a case study with an analytical descriptive approach, pre-test and post-test, on one patient with hypertension, Mrs. S, aged 44, in Awang Bangkal Barat Village, Karang Intan District. Data collection using Gordon's pattern assessment sheet with interview techniques, observation, and physical examination. Furthermore, analyze the data from the assessment results, diagnosis, intervention, implementation, and evaluation. Clients are given the main intervention in the form of Tai Chi exercises 3x/week for 2 weeks (a total of 6 times implementation) with a duration of 5 minutes of warm-up, 27 minutes of core movements, and 3 minutes of cooling. Blood pressure measurements were taken before and 15 minutes after the exercise.

Result

Case Illustration

The assessment was carried out on one of the hypertensive patients in Awang Bangkal Barat Village on November 10, 2023, at 11.45 WITA at the client's house, Mrs. S, female, 44 years old. Mrs. S has a history of hospitalization in 2020 because her blood pressure reached >200 mmHg. When a physical examination was conducted, the results showed a pulse frequency of 98x/min with a regular rhythm, a breathing frequency of 20x/min, and a blood pressure of 180/100 mmHg, indicating grade 3 hypertension.

Patient's Condition

The assessment results obtained by Mrs. S said that her head felt tight and full when her blood pressure was very high (>180 mmHg). Mrs. S knows she has hypertension since she was hospitalized in 2020. In the past, the client liked to eat fermented fish (wadi) and fermented durian (tempoyak). Currently, Mrs. S reduces the consumption of salty foods, regularly goes to the doctor once a month, and regularly takes anti-hypertensive drugs (amlodipine 1x5 mg and candesartan 1x16 mg).

Further examination of Mrs. S obtained compos mentis consciousness with GCS 4 5 6. The client can carry out daily activities independently. However, complaints will arise if the client feels too tired without adequate rest. When asked about hypertension-related knowledge, the client can answer the definition, causes, signs and symptoms, consequences, and treatment of hypertension.

However, the client has never done exercise.

Nurses perform nursing actions in the form of Tai Chi exercises. Tai Chi exercises were carried out from November 15, 2023 - November 25, 2023, 3x/week for 2 weeks with an interval of one day according to the client's free time, so that 2 meetings were held at 10.00 WITA and 4 meetings were held at 14.30 WITA. This exercise consists of 3 series, namely warm-up, core movements, and cooling, with a duration of warm-up and cooling of 5 - 10 minutes and 27 minutes of exercise for 9 movements.

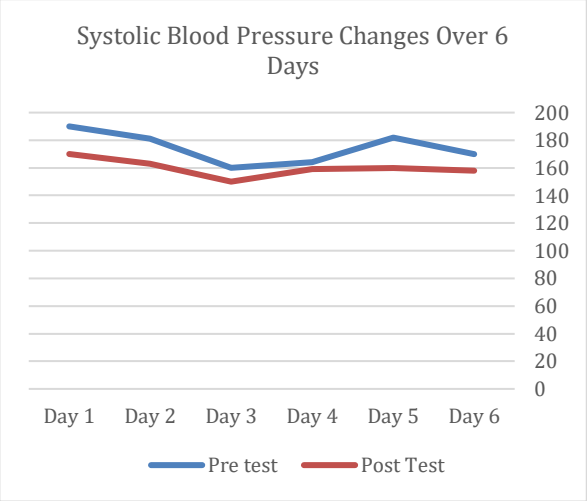

Figure 1 Systolic Blood Pressure Changes Over 6 Days of Implementation

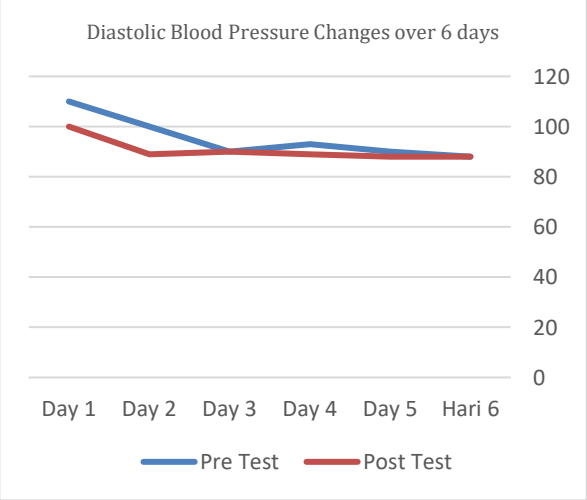

Figure 2 Diastolic Blood Pressure Changes During 6 Days of Implementation

The average results of the decrease in Mrs. S's blood pressure after 6 times the implementation of Tai Chi exercises obtained from initial measurement (pre-test), systolic pressure of 174.5 mmHg, and diastolic pressure of 95.1 mmHg. In the final measurement (post-test, 15 minutes after the exercise), the average systolic pressure was 160 mmHg, and diastolic pressure was 90.6 mmHg, as shown in Figures 1 and 2. So, there was a decrease in systolic blood pressure by 14.5 mmHg and diastolic blood pressure by 4.5 mmHg.

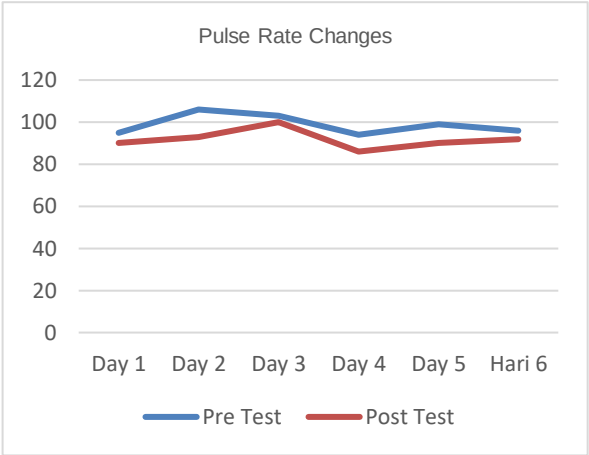

Figure 3 Pulse Rate Changes Over 6 Days of Implementation

In addition, there was a decrease in pulse rate, with an average of 98.9x/min to 91.8x/min (figure 3). These results show a decrease in pulse rate of 7x/min.

Discussion

Tai Chi exercise is a traditional Chinese sport that can lower blood pressure using slow movements, deep breathing, and mindfulness with elements of meditation. When performed correctly, tai chi exercises with soft motions and deep breathing can lower heart rate, improve blood flow, and raise blood oxygen levels (Salini & Sutanti, 2023). Through deep breathing exercises and mild muscle movements, tai chi activities assist in lowering stress, which is one of the risk factors for hypertension (Emilyani et al., 2023).

Tai Chi exercises performed 3x/week for 2 weeks with 6 treatments for 25-30 minutes are very influential in reducing blood pressure (Salini & Sutantri, 2023). This happens because the flow of blood and oxygen to the heart muscle increases during exercise. Participating in physical activity raises the oxygen demand in cells for energy production, raising heart rate, cardiac output, and blood pressure. Blood vessels dilate or widen after resting, which causes blood flow to drop temporarily. About 30 - 120 minutes later,

blood pressure will return before the exercise (Syahrir et al., 2023). Regular exercisers will likely see longer-lasting stable blood pressure and more elastic blood vessels (Aji et al., 2023).

Theoretically, Tai Chi exercises (Widharto, 2009; Emilyani et al., 2023) involve body-mind-soul-breath movements that can regulate blood pressure because they lower cortisol levels, increase the release of adrenaline through urine, and decrease sympathetic nerve activity, all of which have a positive effect on the heart (delivering a stable heart rate and lowering blood pressure towards normal). This results from a balanced and harmonious sympathetic and parasympathetic nervous system. Additionally, exercise can raise antioxidant levels to help the body eliminate free radicals and maintain blood pressure (Emilyani et al., 2023). The movements in Tai Chi exercises tend to be slow because they emphasize focus and harmony of movement and breath processing. Breathing exercises in Tai Chi help flow oxygen, improving blood circulation and maintaining heart and brain activity (Kresnayana et al, 2020).

The results showed a decrease in blood pressure in Mrs. S differently at each time. This is influenced by the accuracy and seriousness of the respondent in doing exercise movements so that it affects the relaxed condition of his body. Mrs. S said that she felt nervous and tense every time a blood pressure check was carried out. This also affected the results of blood pressure measurements. In addition, the factor that most influences respondents in the implementation of Tai Chi exercise is a comfortable and supportive environment in doing the exercise. Respondents' calmness and concentration significantly affect the exercise's success (Emilyani et al., 2023).

Several factors, such as age, gender, genetics, unhealthy diet, and lack of physical activity, influence hypertension. According to Irawan, Adiratna, and Amin (2020), the older the age, the more at risk of hypertension. This happens because the regulation of lime (calcium) metabolism is disturbed in old age. This causes a lot of lime to circulate in the bloodstream. As a result, the blood becomes more concentrated, and blood pressure increases. Calcium deposits in the blood vessel walls (atherosclerosis) cause narrowing of the blood vessels. Blood flow becomes disrupted and spurs an increase in blood pressure (Putri, 2015). In addition, the older the age, the more arteries decrease so that they become more rigid and less able to respond to systolic blood pressure because the blood vessel wall is unable to react or return to its original position with the same flexibility when there is a decrease in pressure, causing diastolic pressure also to increase (Irawan et al., 2020).

Apart from age, gender is also a contributing factor to hypertension. Women tend to suffer from hypertension than men after menopause (age > 45 years). This occurs because of the role of the hormone estrogen in increasing HDL (High-Density Lipoprotein) levels before women experience menopause. High HDL cholesterol levels are a protective factor in preventing atherosclerosis (Irawan et al., 2020).

Salty and fried foods are also one of the factors that affect hypertension. The fermented fish with salt contains a lot of sodium, which, when consumed, will cause the body to retain water at a level exceeding the standard body limit, which can increase blood volume and cause blood pressure to increase (Fitri & Ananda, 2022). The habit of eating fried and coconut milk side dishes can trigger hypertension because it causes plaque formation in blood vessels. This can lead to atherosclerosis, so that blood vessels lose their elasticity. When blood flow is disrupted, it can increase blood pressure and trigger the occurrence of hypertension (Rahma & Baskari, 2019).

Besides food, physical activity is also crucial to blood pressure. A person with less physical activity (exercise) has unstable appetite control, so energy consumption becomes excessive. This increases appetite and, eventually, weight gain (Putriastuti, 2016). Exercise improves the work and function of the heart, lungs, and blood vessels, characterized by a decreased resting pulse, reduced lactic acid buildup, increased HDL cholesterol, and reduced atherosclerosis. Exercise with light and appropriate loads is isometric exercises that are generally aerobic, such as walking, jogging and cycling. A reduction in blood pressure will be seen after two weeks of exercise and will persist as long as the individual continues the habit (Ammara

Batool et al., 2018).

Conclusions

Tai Chi exercise, carried out 6 times for 2 weeks with an interval of 1 day, was proven to affect lowering blood pressure in hypertensive patients. In addition, Tai Chi exercise can also reduce the pulse rate after 6 times of implementation. Tai Chi exercise can be one of the nursing interventions in non-pharmacological therapy to reduce blood pressure in hypertensive patients.

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