

Maumere exercise therapy and low salt diet in hypertension sufferers: an effort to lower blood pressure

Terapia de ejercicio Maumere y dieta baja en sal en hipertensos: un esfuerzo para reducir la presión arterial

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Abstract. This think about points to analyze and demonstrate the helpful impacts of Maumere Exercise and a low-salt slim down on blood weight lessening. This test consider utilized a some time recently and after control gather plan. The investigate subjects were chosen employing a purposive sampling strategy and after that the subjects were isolated into 2 bunches to be specific the control bunch (K1) and the accepting bunch maumere exercise therapy and low salt diet (K2). A add up to of 20 hypertensive patients matured 25 years and over taken part in this consider. On the primary day, all subjects took information on the characteristics of the investigate subjects, at that point the inquire about subjects measured the pretest blood weight 3 hours some time recently warming up. Moreover, the subjects performed maumere exercise therapytreatment mediation with an concentrated of 60-75% of most extreme capacity. The tumbling was done 4x1 week for 4 weeks. The moo salt slim down intercession was carried out from the primary day after the pretest until the final day with utilization of salt levels <1000 mg Na per day. On the final day of the mediation, after 24 hours the subject was taken posttest information to degree blood weight. Blood pressure estimation through a sphygmomanometer. The comes about of this ponder detailed that maumere exercise therapytreatment and a low salt count calories were able to essentially decrease blood weight in hypertensive patients ($*p<0.05$). We accept that the most cause of hypertension is due to harm to contracted blood vessels and over the top salt utilization. Since hypertension can lead to illnesses such as stroke, coronary heart illness, diabetes, and kidney infection, with maumere exercise therapytreatment and a moo salt slim down, the body's metabolism will ordinarily run since the heart valves that were already sclerosed and thickened slowly return to ordinary, the myocardium is now not firm, the heart muscle contracts, the volume of the pulse and cardiac yield not increment. We exceedingly prescribe the utilize of maumere exercise therapytreatment and low salt diet which has numerous positive benefits for hypertension patients with steady physical execution.

Keywords: Maumere Exercise Therapy, Blood Pressure, Low Salt Diet, Hypertension.

Resumen. Este pensamiento acerca de los puntos para analizar y demostrar los impactos útiles de Maumere Ejercicio y un bajo contenido de sal adelgazar en la reducción de peso en la sangre. Esta prueba considera utilizó un algún tiempo recientemente y después de plan de control se reúnen. Los sujetos de investigación fueron elegidos empleando una estrategia de muestreo intencional y después de que los sujetos fueron aislados en 2 racimos para ser específico el grupo de control (K1) y el grupo de aceptar la terapia de ejercicio maumere y dieta baja en sal (K2). Un total de 20 pacientes hipertensos mayores de 25 años participaron en este estudio. En el día primario, todos los sujetos tomaron información sobre las características de los sujetos de investigación, en ese momento la investigación sobre los temas medidos el peso en sangre pretest 3 horas algún tiempo recientemente el calentamiento. Además, los sujetos realizaron la mediación de la terapia de ejercicio maumere con un concentrado de 60-75% de la capacidad más extrema. La voltereta se realizó 4x1 semana durante 4 semanas. La intercesión para adelgazar se llevó a cabo desde el primer día después de la prueba preliminar hasta el último día con la utilización de niveles de sal <1000 mg Na por día. En el último día de la mediación, después de 24 horas el sujeto fue tomado posttest información para el grado de peso en la sangre. Estimación de la presión arterial a través de un esfigmomanómetro. Los resultados de esta ponderación detallaron que la terapia de ejercicio maumere y un bajo conteo de calorías de sal fueron capaces de disminuir esencialmente el peso en sangre en pacientes hipertensos ($*p<0.05$). Aceptamos que la mayor parte de la causa de la hipertensión se debe al daño de los vasos sanguíneos contraídos y a la utilización excesiva de sal. Dado que la hipertensión puede conducir a enfermedades como el accidente cerebrovascular, enfermedad coronaria, la diabetes y la infección renal, con maumere exercise therapytreatment y un moo sal slim down, el metabolismo del cuerpo ordinariamente ejecutar desde las válvulas del corazón que ya estaban esclerosadas y engrosadas lentamente volver a ordinario, el miocardio no es ahora firme, el músculo del corazón se contrae, el volumen del pulso y el rendimiento cardíaco no aumentar. Prescribimos excesivamente el uso de maumere exercise therapytreatment y dieta baja en sal que tiene numerosos beneficios positivos para los pacientes hipertensos con ejecución física constante.

Palabras clave: Maumere Terapia de Ejercicio, Presión Arterial, Dieta Baja en Sal, Hipertensión.

Fecha recepción: 21-04-24. Fecha de aceptación: 09-05-24

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Introduction

Sport is a crucial part of everyday life (Kreft, 2012). Sport aims to improve the quality of human life physically, mentally, and socially to create an advanced, just, prosperous, and democratic society (Varey, 2010). However, the progress of the times led to the development of increasingly sophisticated technology which is characterized by all-

machine (Myszczynska et al., 2020). This has an impact on lifestyles that no longer use parts of the body to move, but instead replace them with electronic devices and means of transportation that are classified as stationary (Lyons, 2015). As activity decreased, their physical condition worsened (Lyons, 2015). This lifestyle can affect health, one of which is hypertension. Hypertension is a non-communicable degenerative disease (Di Daniele, 2019). The

prevalence of hypertension across Europe is estimated to be 30-45%, with increasing blood pressure (BP) levels at higher ages. Approximately 25% of heart attacks in the European region have been directly attributed to hypertension in recent years and hypertension induced CV disease is thought to be responsible for approximately 40% of all annual deaths in Europe (Juliao Vargas et al., 2023). The prevalence of high blood pressure (BP) is higher than 10% in school-aged children in America, which is concerning given that hypertension can damage brain structure and function, leading to impaired cognitive function (Okilanda et al., 2024; Rêgo et al., 2019).

The increasing rate of non-communicable diseases is very visible in Southeast Asia such as Indonesia (Angkawaranon et al., 2014). Hypertension, as a silent killer, is one of the largest causes of morbidity in the world (Corrêa Neto et al., 2022). A significant risk factor for heart failure, stroke, and coronary artery disease is hypertension (Rodriguez-Fuentes et al., 2024; Sari, Kurniawan, et al., 2023; Selviani et al., 2024). In 2019, there were 1.13 billion people in the world with high blood pressure. (Dzau & Balatbat, 2019). By 2025, it is anticipated that the number of people with hypertension would have continued to rise, with 9.4 million fatalities from the condition (Sari, Kurniawan, et al., 2023). Twenty-two percent of the world's population suffers from hypertension, and nothing is done to lower blood pressure (Sharman et al., 2020).

The public's health is at risk due to hypertension, which can exacerbate renal disease, coronary heart disease, and stroke problems (Gosmanova et al., 2016). According to statistics from Basic Health Research (Risikesdas), there were more people with hypertension in Indonesia in 2018 (34.1%) than there were in 2013 (25.8%) (Sari, Bafirman, et al., 2023). The Comes about of Fundamental Wellbeing Inquire about (2018) detailed a 34.1% rate of hypertension over the age of 18 a long time. 31.6% within the age group 31-44 a long time, 45.3% within the age gather 45-54 a long time, and 55.2% within the age gather 55-64 a long time (de Oliveira et al., 2020). Exercise influences individuals with hypertension by expanding resistance, anticipating corpulence, controlling blood glucose levels, normalizing blood pressure, and expanding workability (Fuente et al., 2005). Exercise can lower add up to cholesterol, offer assistance move forward blood lipid profiles, LDL, and triglycerides increment HDL, decrease blood pressure, and progress the hemostatic system (Yildizhan et al., 2009).

Many studies have looked at ways to lower blood pressure, but it's harder to do in older people. (Mancia et al., 2007). The results of Sari's research (2023), There have been numerous thinks about on bringing down blood pressure, but there are numerous restrictions at certain ages, specifically the elderly (Sari, Bafirman, et al., 2023). In the interim, individuals with hypertension are not as it were the elderly but of beneficial age (18-30 years) (Buang et al., 2019). The arrangement advertised for diminishing blood pressure in hypertension sufferers is to do Maumere gymnastics as a non-pharmacological treatment (Rizka et al.,

2022). Maumere gymnastics can be taken after by young people to the elderly (Goethals et al., 2020). Their lively developments and energetic melodies can increment continuance and muscle quality on the off chance that done frequently (Goethals et al., 2020). It has long been recognized by the public in terms of its distinctive and traditional local music. The movements of maumere gymnastics are the result of the acculturation of the fun, energetic and rhythmic maumere dance plus the cultural elements of Flores, East Nusa Tenggara Province, Indonesia (Sumarni et al., 2023). There are 3 basic movements of Maumere gymnastics: left or right movement, raising hands up and agile foot movements and making rotations around the body from right to left following the rhythm of the song while raising both hands (Sari, Bafirman, et al., 2023).

Maumere gymnastics is a gentle form of exercise that can help older people relax. It works by triggering the release of certain chemicals in the body that make you feel good. This can be helpful for people who don't want to take medication. (Indika et al., 2023). Maumere exercise can invigorate serotonin synthesis and actuate parasympathetic nerves to decrease catecholamines, epinephrine, and norepinephrine so that the elderly can more effectively begin resting (Sari, Kurniawan, et al., 2023). The reason of doing Maumere exercise is to extend blood stream and oxygen supply to dynamic muscles and skeletons, particularly the heart muscle so that it can lower blood pressure (Didi et al., 2017). After resting, the blood vessels will get bigger and the flow of blood will decrease for some time, usually 30-120 minutes, and then go back to the normal blood pressure before exercising (Didi et al., 2017). When you exercise a lot, your blood vessels become stretchier and the drop in blood pressure will stay for a longer time. When the blood vessels widen, it will reduce your blood pressure after exercising. (Widiyanto et al., 2021).

Apart from doing maumere gymnastics, a low-salt diet can reduce volume loads so that it can lower blood pressure (Bie, 2009). A low-salt diet is a diet cooked with or without using salt, but with certain restrictions (Morando et al., 2015). The low salt used is sodium salt (Watson & Austin, 2021). Sodium helps keep the right amount of fluid outside the cells in the body. (Watson & Austin, 2021). Excessive sodium intake can cause disturbances in the body's fluid balance, causing edema or ascites, and hypertension (Tinawi, 2020). Eating less salt can help reduce high blood pressure and keep it at a healthy level. (Graudal et al., 2020).

According to Health Canada's nutritional advice, our bodies only need 115 mg of sodium daily to maintain good health (Herazo Beltran et al., 2020). Compared to that, 1 teaspoon of salt has 2000 (Devi et al., 2023). According to the UK RNI, the recommended calcium intake is at least 575mg and a maximum of 1600 mg WHO recommends limiting sodium intake to 2400 mg or about one teaspoon of salt daily (Espinosa Méndez et al., 2023). The possibility of salt deficiency for Indonesians is very low as most of the foods available in our country are high in sodium (Herazo Beltran et al., 2020).

Even diet menus are high in sodium, such as the South Beach Diet, which includes 2,300 to 6,700 mg of sodium per day. By eating only natural ingredients and avoiding processed foods, the amount of sodium consumed will be within normal limits. Foods that are high in sodium, such as chips, canned soups, processed meats, salted fish, soy sauce, tomato sauce, block chicken broth, and cheese should be avoided or at least reduced because they can cause high blood pressure (hypertension) which can be a trigger for heart disease, stroke, and kidney problems (Buang et al., 2019; Pujiastuti & Tesalonika, 2022; Sharman et al., 2020). In general, the more processed these food items are, the higher their sodium content will be (Hernández-Cruz et al., 2022).

Methods

Study Design

This experimental research employs pre and post-control gather plan. Inquire about subjects were chosen employing a purposive examining method. This is in line with research (Alvarez et al., 2023; Galaviz Berelleza et al., 2021) by dividing the group into 2, namely the control group and the intervention group with patients with hypertension. Following, the subjects were isolated into 2 bunches. In this ponder, the mediations were maumere exercise and a low salt diet for hypertensive patients.

Subject

A add up to of 20 hypertensive patients taken an interest in this think about (subject characteristics are appeared in Table 1). The incorporation criteria in this consider were patients matured 25 a long time and over, with typical BMI, and no sports preparing. Prohibition criteria The avoidance criteria in this think about were subjects beneath 25 a long time of age and ordinary blood weight. Dropout criteria in this ponder are expending coffee, and devouring nourishments with overabundance salt. The investigate subjects gotten an clarification of the investigate methods and marked a letter of assent willing to be inquire about subjects. The process of selecting samples in the study by screening with interview methods related to treatment as well as time categories and hypertension levels and also non-test instruments that are filled in using the forms that have been provided. Provide an explanation to prospective subjects about the research (information for consent) and if they agree, they are directed to fill in the prepared informed consent.

Procedures

The stages of the inquire about carried out are: Collection of tests and clarifications to the test with respect to the inquire about to be carried out. In case the test is willing, the test will fill within the educated assent. Subjects were separated into two bunches, specifically the control bunch (K1) and the accepting gather Maumere work out and moo salt slim down (K2). The control gather was not given the

intercession and the mediation bunch was given Maumere exercises and a low salt diet <1000 Mg/day Na. Pretest by measuring blood weight through a sphygmomanometer. 3 hours some time recently doing gymnastics. During the ponder, the test ought to as it were eat nourishments with add up to salt <1000 mg/day Na. Samples were given maumere work out intercession for 4 weeks with 4 gatherings in 1 week. Then a Posttest was carried out by measuring blood weight once more at the 16th assembly after 24 hours of doing maumere work out treatment and a moo salt slim down. After the information is gotten, the information is analyzed through nonparametric tests and Wilcoxon signed rank test.

CONSORT Flowchart

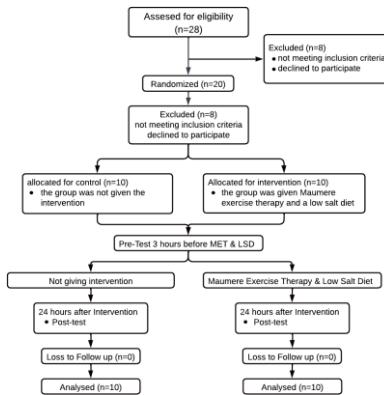


Figure 1. The CONSORT Flowchart

Statistical Analysis

Statistical analysis in this think about utilized IBM SPSS form 25, and graphic tests were conducted to get the cruel, standard deviation, and standard blunder. After that, a ordinariness test was conducted utilizing the Shapiro-Wilk method; on the off chance that the information was regularly disseminated, a contrast test was conducted utilizing the matched t-test but on the off chance that the information was not ordinarily disseminated, a distinction test was conducted utilizing the Wilcoxon signed-rank test.

Results

Information on the characteristics of the investigate subjects are appeared in Table 1

Table 1.
Characteristics of the investigate subject

Characteristics	N	$\bar{x} \pm SD$	Shapiro-Wilk	p-value
Age	20	33.60 ± 2.83	0.153	0.387
Weight	20	63.55 ± 9.23	0.243	0.167
Height	20	157 ± 4.17	0.345	0.472
BMI	20	23.13 ± 4.20	0.451	0.174

Maumere exercise therapy and a low-salt diet reduce blood pressure in hypertension sufferers

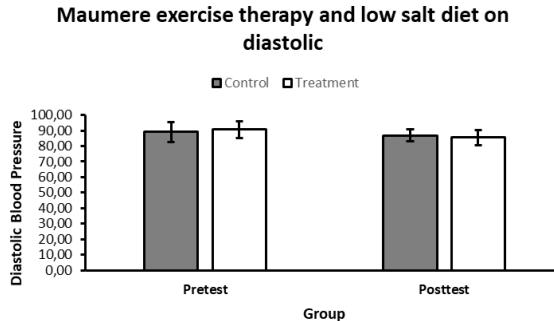
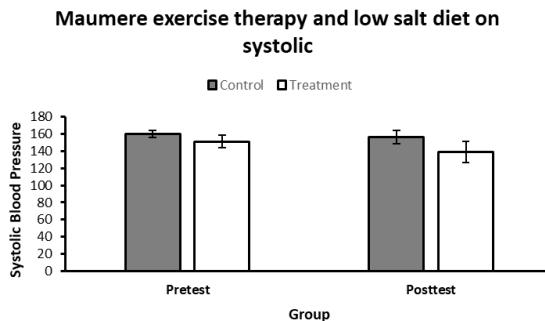
Middle blood weight examination comes about pre-test

and post-test for each bunch are displayed in Figure 2.

Table 2.

Normality Test Comes about for blood pressure (BP)

Data	Group	Shapiro Wilk	
		n	p-value
BP (PreTest)	K1	10	0.146
	K2	10	0.245
BP (PostTest)	K1	10	0.346

Figure. 2 Expressive insights (cruel \pm one standard deviation) for the bunch Maumere exercise treatment and low salt diet on systolic and diastolic

As can be seen in Figure 2, we are able see and compare the comes about of systolic and diastolic blood pressure estimations due to maumere exercise and low salt diet from

the pretest and posttest within the control gather (K1) and treatment bunch (K2).

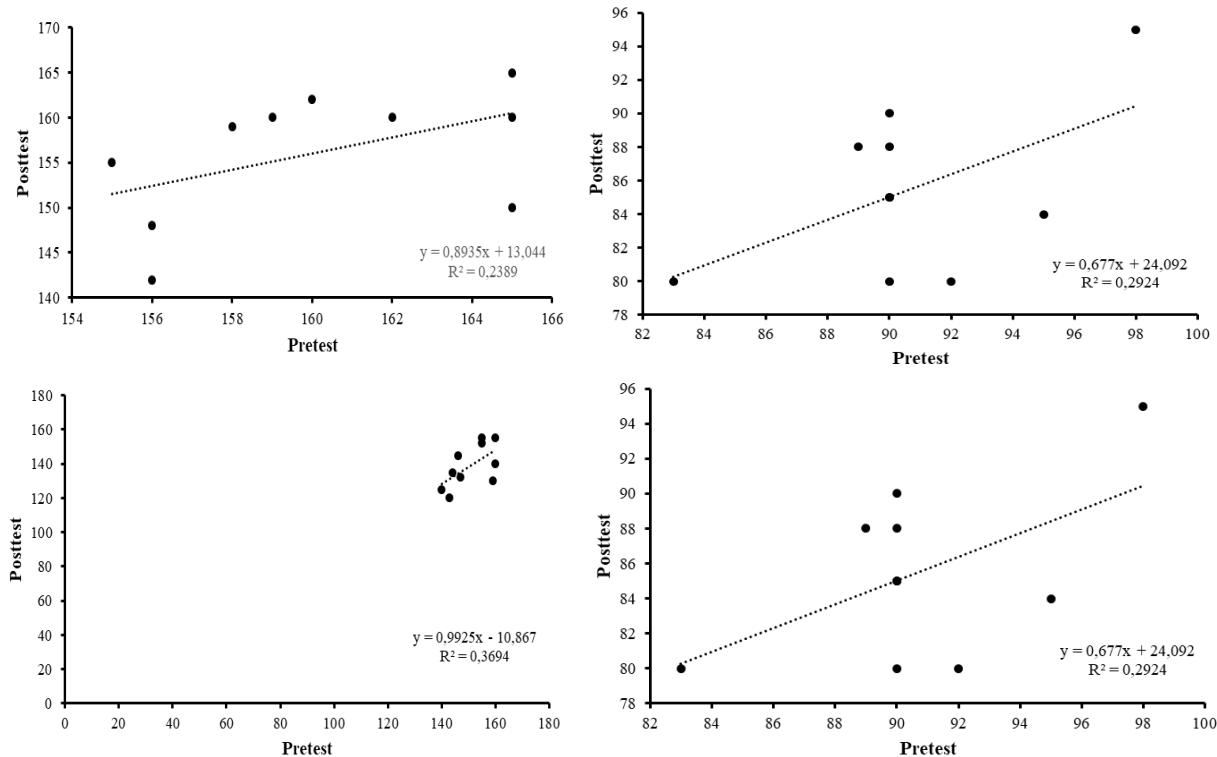


Figure. 3 Relapse line and coefficient of assurance

It is obvious in Figure 3 that we are able see how the impact of the autonomous factors together (at the same time) influences the subordinate variable which can be shown by the balanced R Squared esteem. The coefficient of assurance appears the degree to which the commitment of the free factors within the relapse show can clarify varieties in systolic and diastolic blood pressure due to maumere gymnastics and low salt diet from the pretest and posttest

within the control bunch (K1) and treatment bunch (K2).

Table 3.
Different Test Results for blood pressure

Distinctive Test Method	Group	Tested	P
Wilcoxon signed-rank test	K1 (Pre-Post Test)	(Systolic)	0.087
	K2 (Pre-Post Test)	(Systolic)	0.003
Wilcoxon signed-rank test	K1 (Pre-Post Test)	(Diastolic)	0.126
	K2 (Pre-Post Test)	(Diastolic)	0.006

There was no noteworthy contrast between K1
There was a noteworthy contrast between K2

As in table 3 If the asymp. Sig < 0.05 then the hypothesis is accepted, if the value of asymp. Sig > 0.05 then the hypothesis is rejected. The hypothesis proposed is that there are differences in systolic and diastolic blood pressure between the treatment group and the control group. Based on the statistical test output Sig (2-tailed) systolic and diastolic at (K2) $0.087 < 0.05$ and $0.126 < 0.05$. While the statistical test output is known that the Sig (2-tailed) systolic and diastolic asymp values in (K2) are $0.003 < 0.05$ and $0.006 < 0.05$. So it can be concluded that the hypothesis is accepted. Thus it can be said that there are differences in systolic and diastolic blood pressure between the treatment group and the control group. Because there is a significant difference, it can be said that "there is an effect of maumere gymnastics and low salt diet on reducing systolic and diastolic blood pressure".

Discussions

This study aimed to show how doing maumere exercises and eating less salt can lower blood pressure in people with high blood pressure. Our study found that people in the maumere gymnastics group who ate less salt had lower blood pressure. Those who didn't do maumere gymnastics and ate less salt did not have a significant change in blood pressure.

Doing physical activities like maumere gymnastics can lower your blood pressure. (Sari, Kurniawan, et al., 2023). Engaging in the Maumere exercise can contribute to maintaining a healthy and robust cardiovascular system. (Bafirman et al., 2024). Exercising will make your heart and body work better. (Narici et al., 2021). When you do active exercises like running or swimming, your blood pressure goes up. After you finish, your blood pressure may go lower than usual. (Park et al., 2020). Blood pressure goes down because blood vessels open up and relax. (Hidayaturrohkim et al., 2023). Regular physical activity can make blood vessels less tense, which can lower blood pressure. (Coovadia et al., 2020). Physical activity causes our blood vessels to become more relaxed and wider, leading to a decrease in blood pressure. It's like how water pressure decreases when a pipe gets wider. (Sauge et al., 2022).

In this study, it was found that there was an effect of Maumere gymnastics and a low-salt diet on reducing blood pressure in hypertensive patients (Sari, Kurniawan, et al., 2023). Typically in line with the investigate of Barreto et al (2020) which found that the esteem of the hypertension bunch on systolic t-count blood weight with a likelihood (Sig) of $0.005 < 0.05$ and diastolic with a probability (Sig) $0.007 < 0.0646$. So there's a critical effect on the organization of Low Impact Aerobic Tumbling treatment within the hypertension gather (Barreto et al., 2023). Gymnastics can diminish blood weight levels by fortifying a diminish in thoughtful nerve action and an increment in

parasympathetic nerve movement which influences a diminish within the hormones adrenaline, norepinephrine, and catecholamines as well as vasodilation within the blood vessels which comes about in smooth oxygen transport all through the body, particularly the brain so that it can diminish blood pressure and beat gotten to be ordinary (Raven & Chapleau, 2014). Many of the elderly often do light exercise, namely Maumere gymnastics (Izquierdo et al., 2021).

Low-impact oxygen consuming exercise (maumere) can increment HDL which in turn makes a difference metabolic forms and brings down LDL levels. Low-intensity medium-impact vigorous exercise comprises of warm-up works out, center exercises, and cool-down exercises where the developments too point to diminish uneasiness, and stretch, and diminish misery levels (Bhawika et al., 2019). This medicine will strengthen the work of the body's nervous system, especially the part that helps relax the blood vessels and lower blood pressure. (Baker & Kimpinski, 2018). Low-impact aerobics can help lower blood pressure by improving the body's health and fitness. It involves moving the body in a steady and rhythmic way to strengthen the heart, muscles, flexibility and body shape. The exercises use music to keep you motivated and set a pace for your workout. (Hu et al., 2021).

In addition to exercise gymnastics, a low-salt diet can also reduce blood pressure (Barreto et al., 2023). Salt admissions is measured by evaluating the salt substance of nourishment and pee each day (Kim & Sung, 2014). When the eat less is low in salt, patients involvement a negative sodium adjust and blood pressure falls, indeed in spite of the fact that protein admissions is expanded (Sari, Bafirman, et al., 2023). On the other hand, when the slim down is tall in salt, less salt is excreted within the pee so that the patient's sodium adjust is positive and blood pressure increments indeed when protein admissions is low (Pinter et al., 2020). So it can be concluded that it is salt that fundamentally influences blood pressure. They managed to reduce blood pressure by limiting salt intake (Ha, 2014).

One of the things that support one of the factors that trigger hypertension is the high intake of salt or sodium content in foods consumed by the community (Romero et al., 2022). Absorption of sodium into the bloodstream from high salt intake causes fluid retention, resulting in more blood (O'Donnell et al., 2020). This leads to an increase in blood pressure. Increased sodium consumption can result in the excessive release of natriuretic hormone which will eventually increase blood pressure indirectly (Sari, Kurniawan, et al., 2023).

According to experts, salt consumption patterns are known to greatly affect the level of hypertension in respondents (Pujiastuti & Tesalonika, 2022). The type of food that contains salt has a significant relationship with the risk of hypertension (Sawicka et al., 2011). The higher the concentration of salt in the body, it will result in an increase in the volume of fluid in the blood, the number of heart pumps, and blood pressure. This is in line with research (Chávez Valenzuela et al., 2022; Leao Ribeiro et al., 2022),

onsuming large amounts of salt can cause narrowing of the diameter of the arteries, which requires the heart to work harder in order to pump the increased blood volume through the narrow space. This can lead to high blood pressure (Hernández-Cruz et al., 2022).

Thinks about are detailing the impact of salt admissions on generally cardiovascular infection (Arnott et al., 2020; O'Donnell et al., 2020; Salah et al., 2021). They recommend that salt decrease avoids the onset of cardiovascular illness (He et al., 2020). Evaluated that lessening salt admissions by 3 g per day decreased systolic blood weight by 5.6 mmHg in hypertensive people (Yu et al., 2021). From the clarification over, the analysts concluded that physical action within the frame of low-impact aerobics (maumere) and having a low-salt diet seem decrease blood pressure in individuals with hypertension (Rodríguez-Fuentes et al., 2024; Welis et al., 2024).

A study suggests that reducing blood pressure is crucial for maintaining overall bodily function and preventing chronic diseases. The study found that decreased flexibility of large blood vessels led to increased systolic and diastolic blood pressure (Sari, Kurniawan, et al., 2023). Gymnastics can improve blood flow to muscles, supplying them with oxygen and nutrients. This increase in molecules like carbon dioxide can promote the dilation of blood vessels, which require more supplements and oxygen (Graudal et al., 2020; Narici et al., 2021). The study proposes that combining exercise and a low-salt diet can achieve effective results in lowering hypertension. However, the study did not examine the impact of nutrition and lifestyle on the patients. The analysts prescribe assist investigate to analyze the impacts of maumere exercise on hypertension while controlling nutrition and lifestyle factors. Overall, the study suggests that maumere exercise, along with a low-salt diet, can be highly beneficial in reducing systolic and diastolic blood pressure, especially for hypertensive patients who are resistant to exercise.

In this study, the limitation is that we only investigated and analyzed the effects of Maumere exercise therapy and a low-salt diet on hypertension. Besides that, We also haven't analyzed nutritional intake and lifestyle. As a future perspective, we intend to analyze the effects of Maumere exercise therapy and a low-salt diet on inflammatory biomarkers, oxidative stress, performance parameters, and adaptive responses to physical exercise. Thus, it is reported that Maumere exercise therapy and a low salt diet in hypertension sufferers can reduce blood pressure levels, which is of course very useful for controlling the increase in degenerative diseases as a trigger for coronary heart disease.

Conclusions

This article talks about the impacts of combining maumere exercise with a low-salt diet on blood pressure. The ponder found that the gather that performed maumere exercise nearby a low-salt diet experienced a more noteworthy lessening in blood pressure compared to the gather

that did not perform maumere exercise with a low-salt diet. The comes about propose that maumere exercise is compelling in bringing down blood pressure and making strides different viewpoints of cardiovascular wellbeing. The consider watched advancements in heart muscle compression, normalization of blood volume and cardiac yield, heart valve wellbeing, and decreased solidness within the myocardium. It is vital to note that way of life components like a low-salt diet, not smoking or drinking liquor, and keeping up a sound weight are moreover vital for overseeing hypertension. Combining a low-salt diet and maumere exercises can be a commonsense approach to bringing down blood pressure and anticipating side effects of stroke and coronary heart illness.

Acknowledgment

We thank the members in this consider. We also thanks the Universitas Negeri Padang. At long last, the creators would like to thank the investigate group who have contributed from the starting of the inquire about to the completion of this investigate.

Conflict of Interests

The creators uncover that there's no struggle of intrigued.

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