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The Effect of Elderly Exercise on Reducing Blood Pressure in Hypertension Sufferers in North Cimpu Village, Suli District, Luwu Regency in 2025

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ABSTRACT

Hypertension is a chronic condition commonly experienced by the elderly and poses a significant risk of serious complications if left untreated. One effective non-pharmacological intervention for managing blood pressure is elderly exercise. This study aims to determine the effect of elderly exercise on reducing blood pressure among hypertension patients in North Cimpu Village, Suli District, Luwu Regency, South Sulawesi Province. The research design used a quantitative approach with a quasi-experimental one-group pretest-posttest design. The sample consisted of 21 elderly individuals aged 45 years and over. Data were collected by measuring blood pressure before and after the elderly exercise intervention. Statistical analysis using the Wilcoxon Signed Rank Test showed a significant effect of elderly exercise in lowering both systolic and diastolic blood pressure (p = 0.000). These findings suggest that elderly exercise is an effective strategy for reducing blood pressure and can be recommended as a promotive and preventive effort for managing hypertension in the elderly population.

Keywords: *Hypertension, Elderly, Elderly Exercise*

INTRODUCTION

Hypertensio**n**, often referred to by the public as "high blood pressure," is a medical condition characterized by increased pressure within the blood vessels. Blood pressure is divided into two components: systolic pressure, which occurs when the heart contracts to pump blood, and diastolic pressure, which reflects the pressure when the heart is in a resting state. A person is considered hypertensive if their systolic pressure reaches 140 mmHg or higher, or their diastolic pressure is 90 mmHg or more, according to the World Health Organization (WHO, 2019).

Hypertension is a highly prevalent condition worldwide. Approximately 22 percent of the global population is affected by it, with around two-thirds of those cases found in low and middle-

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income countries (Ministry of Health, 2019). In 2015, it was estimated that one in every four men and one in every five women were living with hypertension (WHO, 2019). Based on the 2018 Basic Health Research conducted in Indonesia, the prevalence among adults over 18 years old reached 34.11 percent. Individuals with a family history of hypertension, those aged above 65, and people suffering from chronic illnesses such as diabetes and kidney disease are more likely to develop this condition. Other contributing factors include unhealthy eating habits, lack of physical activity, smoking, alcohol consumption, and being overweight (WHO, 2019).

According to WHO data, the highest rates of hypertension are found in Africa at 27 percent, followed by the Eastern Mediterranean at 26 percent, Southeast Asia at 25 percent, Europe at 23 percent, the Western Pacific at 19 percent, and the Americas at 18 percent. The organization also reported that one in five women globally has hypertension, and the prevalence is generally higher among women than men (WHO, 2019). The 2018 Basic Health Research data showed that the percentage of people diagnosed with hypertension by healthcare professionals based on interviews rose from 7.6 percent in 2013 to 9.5 percent in 2018. While provinces like Papua, West Papua, and Riau showed a decline, others experienced no change or saw an increase (Ministry of Health, 2019).

In South Sulawesi Province, data from the 2020 Provincial Health Office revealed that Makassar City had the most hypertension cases with 290,247 recorded, followed by Bone Regency with 158,516 cases, and Gowa Regency with 157,221 cases. The lowest number of cases was recorded in Barru Regency with 1,500. In Luwu Regency, hypertension has been the leading non-communicable disease for the past four years. In 2021, the number of people with hypertension reached 4,077, with the highest number recorded in 2019 at 5,511 cases (Luwu Regency Profile, 2022). According to data from the Suli Health Center in 2024, out of 880 elderly individuals in Suli District, 492 were diagnosed with hypertension. In North Cimpu Village specifically, out of 107 elderly residents, 64 were affected.

One effective non-medication approach to managing hypertension among older adults is elderly gymnastics. This form of exercise is light, easy to perform, and suitable for senior individuals. It contributes to physical well-being by strengthening bones, supporting optimal heart function, and aiding the removal of excess free radicals from the body. Regular participation in elderly gymnastics improves physical fitness, enhances heart performance, reduces blood pressure, and minimizes fat accumulation in blood vessels, thus maintaining their flexibility. It also helps the heart muscle maintain its ability to contract and pump efficiently (Suroto, 2019).

Elderly gymnastics consists of planned and structured physical movements tailored to the abilities of older adults. It benefits not only the body by improving blood circulation, respiratory function, and muscular strength, but also the mind by reducing stress, enhancing focus, and supporting emotional stability (Widianti and Atikah, 2020, Eviyanti et al., 2021).

The 2018 Riskesdas highlighted a rise in degenerative diseases including heart and vascular conditions, with hypertension increasing from 25.8 percent to 34.1 percent. South Kalimantan had the highest recorded prevalence at 44.1 percent, while Papua had the lowest at 22.2 percent. In South Sulawesi, the prevalence was 31.68 percent. Among women, the rate was 36.9 percent, higher than

the 31.3 percent observed in men. Urban areas showed a slightly higher prevalence at 34.4 percent compared to 33.7 percent in rural areas.

With advancing age, the likelihood of developing hypertension also rises. Due to its often silent symptoms, hypertension is known as the Silent Killer, posing a significant threat to life and reducing an individual's quality of life and productivity (Nilawati et al., 2020). In North Cimpu Village, many people with hypertension rely on medication and traditional remedies without realizing there are other effective solutions, such as elderly gymnastics. This non-drug therapy has been introduced by the local health center in collaboration with local authorities.

To improve elderly health, the government and private sector have provided elder-friendly health services through community health centers and various healthcare institutions. According to the national Minimum Service Standards for health, each district or city is required to conduct annual health screenings for individuals aged 60 and above. In 2021, the percentage of elderly individuals receiving standard services was 51.18 percent nationwide and 42.23 percent in South Sulawesi (Center for Data and Information, Ministry of Health, 2021).

Law Number 36 of 2009 on Health mandates that older adults be supported to maintain a healthy and productive life both socially and economically. The government is responsible for ensuring access to necessary health services and helping elderly individuals remain self-sufficient. The Ministry of Health's policy focuses on improving elderly health by offering accessible and elderly-friendly healthcare services that also benefit families and communities.

Considering all the above, it is important to conduct a study on the topic of "The Effect of Elderly Gymnastics on Blood Pressure Reduction in Hypertensive Patients in North Cimpu Village, Suli District, Luwu Regency in 2025."

This study aims to examine whether the implementation of elderly exercise has a significant effect on lowering blood pressure in hypertensive patients residing in North Cimpu Village, Suli District, Luwu Regency, in the year 2025. The overall objective of this research is to determine the impact of elderly exercise on reducing blood pressure among elderly individuals diagnosed with hypertension in North Cimpu Village, Suli District, Luwu Regency in 2025. Specifically, the study intends to explore several aspects, including the demographic characteristics of the participants such as age and gender, and the comparison of systolic and diastolic blood pressure before and after participating in elderly exercise sessions.

The study also aims to evaluate the measurable influence of elderly exercise on lowering blood pressure among the elderly hypertensive population in the area. This study is expected to provide various benefits. For respondents and the local community, it can offer valuable information regarding the role of elderly exercise in managing hypertension, and serve as an educational resource for controlling blood pressure naturally. For healthcare institutions, the research findings may encourage health workers to pay greater attention to promoting physical activity among elderly hypertensive patients as a form of non-pharmacological intervention. In the academic setting, the results can serve as a reference for students in applying theoretical knowledge to real-life situations and as additional literature for institutional libraries.

For the researcher, the study represents the application of acquired academic knowledge and an opportunity to develop analytical skills in solving health-related problems and formulating evidence-based conclusions. Additionally, this research may contribute directly to the local community where it is conducted by offering practical health recommendations. Engaging in elderly exercise on a regular basis can significantly improve physical endurance, enhance cardiovascular performance, and aid in reducing blood pressure. Such physical activity contributes to the maintenance of healthy heart function and reduces the buildup of fat in blood vessels, leading to improved circulation. Over time, these exercises help the heart muscle contract more efficiently, maintain stable pumping ability, and support the expansion and relaxation of blood vessels.

These physiological changes help decrease the resistance in the blood vessels, which in turn reduces blood pressure. As a result, elderly exercise, when performed consistently, can serve as a sustainable method to lower blood pressure, especially among the elderly. This study applies a therapeutic approach wherein hypertensive elderly individuals participate in elderly exercise sessions three times per week. The effectiveness of this intervention is assessed by comparing blood pressure measurements taken before and after the exercise routine. This conceptual framework provides an abstract model to illustrate the presumed relationship between the intervention and the observed outcome. It serves to communicate how the variables, both dependent and independent, are linked and allows for a structured interpretation of the study's results.

Based on this, the research hypothesis proposed is that elderly exercise has an impact on reducing blood pressure in hypertensive elderly individuals in North Cimpu Village, Suli District, Luwu Regency. To ensure clarity in interpreting the variables under observation, it is essential to establish operational definitions. These definitions serve to focus the scope of the research, guide the data collection process, and support the development of appropriate measurement instruments. Operational definitions also help ensure consistency and accuracy in how variables are assessed and interpreted throughout the study.

METHODS

This study employs a quantitative experimental approach using a one-group pre-test and post-test design. The objective is to examine the cause-and-effect relationship by involving a single group of participants who are observed before and after receiving the intervention. In this case, the intervention consists of elderly exercise sessions, and the outcomes are measured by comparing changes in participants' blood pressure levels before and after participation. The research subjects represent individuals from the target population, which, as defined by Sugiyono (2019), refers to a group of individuals or objects possessing specific characteristics identified by the researcher as relevant to the study.

The data processing in this research is carried out through several key steps. Initially, the data undergoes editing, where the collected information from observation sheets is reviewed for completeness and accuracy. Any incomplete or incorrect responses are returned to participants for clarification. Following this, a coding process is conducted to organize the data manually into

designated categories; for instance, age is grouped into categories such as 45 years, 60–74 years, and 75–90 years, while gender is coded as female or male.

After coding, the data is cleaned by comparing recorded responses with original questionnaire data to identify and correct any discrepancies. Next, a scoring system is applied to quantify the results, allowing the researcher to evaluate potential patterns or relationships between elderly exercise and blood pressure changes. The data is then entered into statistical software such as SPSS, where accuracy and consistency during entry are crucial to prevent bias. Finally, the data is organized into frequency distribution tables for easier interpretation and analysis.To collect data, the researcher uses structured observation sheets as the primary instrument for documenting responses and behaviors. In addition, a manual sphygmomanometer is utilized to measure the participants' blood pressure, ensuring reliable and consistent physiological data collection.

Data analysis in this study is carried out in two stages. First, univariate analysis is used to describe the general characteristics of the respondents and to identify patterns in blood pressure measurements before and after elderly exercise. This provides a preliminary understanding of the data. Subsequently, bivariate analysis is conducted to examine the significance of differences in blood pressure levels before and after the intervention. The Wilcoxon signed-rank test is applied as the statistical method to determine whether the observed changes are statistically significant.

Throughout the research process, ethical considerations are carefully observed to protect the rights and well-being of the participants. Informed consent is obtained from each respondent, ensuring that they fully understand the study's purpose and voluntarily agree to participate. If at any point participants are unwilling or unable to continue, the researcher postpones data collection until the participant is ready. Participant anonymity is maintained by omitting names from all research documents, including interview transcripts and answer sheets, ensuring that personal identities are not disclosed. Moreover, confidentiality is strictly upheld, giving participants the right to decide what information can be shared and when interviews or other forms of data collection may take place. All collected data is kept secure and used solely for research purposes.

Despite efforts to conduct the study effectively, several limitations were encountered during its implementation. One of the main challenges was the uncertainty in determining the exact number of respondents, which may limit the accuracy of the findings in representing the broader population. Another issue was scheduling difficulties, as many of the elderly participants were constrained by age-related health issues and the symptoms of hypertension, making it challenging to coordinate regular meetings. Additionally, not all participants were able to attend every elderly exercise session, which could have affected the consistency of the intervention and, consequently, the research results.

RESULTS

A. Research Results

This research was conducted in North Cimpu Village, Suli District, Luwu Regency in 2025. The village consists of 4 hamlets: Paremang, Sabangparu, Toangkajang, and Pangebarang, with a total population of 1,769 people (901 females and 868 males). The village has a land area of 11,506.602 km². Boundaries of 4 hamlets in North Cimpu Village, Suli District, Luwu Regency in 2025:

1. Cimpu Hamlet is bordered by:

a. North: Salu Paremang Selatan Village
b. South: Cillalang Village
c. West: Kamanre Village
d. East: Sabangparu Hamlet

2. Sabangparu Hamlet is bordered by:

a. North: Jembatan Karung Hamlet
b. South: Wara Village
c. West: Toangkajang Hamlet
d. East: Paremang Hamlet

3. Toangkajang Hamlet is bordered by:

a. North: Jembatan Karung Hamlet
b. South: Wara Village
c. West: Sabangparu Hamlet
d. East: Pangebarang Hamlet

4. Pangebarang Hamlet is bordered by:

a. North: Latitang Hamlet

B. Research Location

1. Research Results

This research was conducted in North Cimpu Village, Suli District, Luwu Regency in 2025. The village consists of 4 hamlets: Paremang, Sabangparu, Toangkajang, and Pangebarang, with a total population of 1,769 people (901 females and 868 males). The village has a land area of 11,506.602 km².

1) Boundaries of North Cimpu Village:

Cimpu Hamlet is bordered by:

a) North: Salu Paremang Selatan Village
b) South: Cillalang Village
c) West: Kamanre Village
d) East: Sabangparu Hamlet

2) Sabangparu Hamlet is bordered by:

a) North: Jembatan Karung Hamlet
b) South: Wara Village

c) West: Toangkajang Hamlet
d) East: Paremang Hamlet

3) Toangkajang Hamlet is bordered by:

a) North: Jembatan Karung Hamlet
b) South: Wara Village
c) West: Sabangparu Hamlet
d) East: Pangebarang Hamlet

4) Pangebarang Hamlet is bordered by:

a) North: Latitang Hamlet
b) South: Tokatapang Hamlet
c) West: Toangkajang Hamlet
d) East: Bone Bay

North Cimpu Village has 3 educational facilities consisting of 1 Kindergarten (TK) and 2 Elementary Schools (SD), namely:

1. SDN 249 Turungan Datu
2. SDN 473 Toangkajang
3. TK Al-Furqan

The research aims to determine the decrease in blood pressure in hypertensive patients in North Cimpu Village, Suli District, Luwu Regency in 2025. Data collection was conducted over 3 meetings from August to September. The data collected is primary data obtained directly from respondents, and data collection was conducted in Salu Paremang Selatan Village, Kamanre District, Luwu Regency.

The research results are presented as follows:

1. Demographic Data

a. Characteristics of respondents based on gender:

Table 1. Characteristics of Respondents Based on Gender in North Cimpu Village, Suli District, Luwu Regency in 2025

Gender	Frequency	%
Male	4	19,0
Female	17	81,0
Total	**21**	**100,0**

Source: Primary Data 2025

Based on Table 1 , it shows that out of 21 respondents, the majority are female, with 17 people (81.0%), and the minority are male, with 4 people (19.0%).

b. Characteristics of respondents based on age:

Table 2. Characteristics of Respondents Based on Age in North Cimpu Village, Suli District, Luwu Regency in 2025

Age	Frequency	%
41-50	14	66,7
51-60	6	28,6
>60	1	4,8
Tota l	**21**	**100,0**

Source: Primary Data 2025

Based on Table 2, it shows that the majority of respondents are aged 41-50 years, with 14 people (66.7%), followed by those aged 51-60 years, with 6 people (28.6%), and the minority are those aged >60 years, with 1 person (4.8%).

2. Variables Studied

a. Univariate Analysis

Variable of systolic blood pressure in elderly hypertensive patients before and after doing elderly gymnastics.The research results show the frequency distribution of respondents according to systolic blood pressure in the elderly before and after doing elderly gymnastics, which can be seen in the following table.

Table 3. Distribution of Systolic Blood Pressure in Elderly Hypertensive Patients Before and After. Systolic Blood Pressure After Elderly Gymnastics in North Cimpu Village, Suli District, Luwu Regency in 2025.

Systolic Blood Pressure	**Mean**	**Median**	**Min-Maks**
Before gymnastics	147,86	150,00	140-160
After gymnastics	137,38	135,00	130-150

Source: Primary Data 2025

Based on the data in Table 3 above, it can be seen that the average systolic blood pressure in the elderly before doing elderly gymnastics is 147.86 with a median score of 150.00, and the lowest average systolic blood pressure before doing elderly gymnastics is 140 and the highest score is 160. Meanwhile, the average systolic blood pressure in the elderly after doing elderly gymnastics is 137.38 with a median score of 135.00, and the lowest average systolic blood pressure after doing elderly gymnastics is 130 and the highest score is 150.

Variable of Diastolic Blood Pressure in Elderly Hypertensive Patients before and after Doing Elderly Gymnastics.The research results show the frequency distribution of respondents according to diastolic blood pressure in the elderly before and after doing elderly gymnastics, which can be seen in the following table 4.

Table 4. Frequency Distribution of Respondents Accordingt To Diastolic Blood Pressure in the Elderly Before and After Doing Elderly Gymnastics

astolic Blood Pressure	**Mean**	**Median**	**Min-Maks**
Before gymnastics	85,00	85,00	80-95
After gymnastics	77,86	80,00	60-90

Source: Primary Data 2025

Based on the data in Table 1.6 above, it can be seen that the average diastolic blood pressure in the elderly before doing elderly gymnastics is 85.00 with a median score of 85.00, and the lowest average diastolic blood pressure before doing elderly gymnastics is 80 and the highest score is 95. Meanwhile, the average diastolic blood pressure in the elderly after doing elderly gymnastics is 77.86 with a median score of 80.00, and the lowest average diastolic blood pressure after doing elderly gymnastics is 60 and the highest score is 90.

b. Bivariate Analysis

Table 5. Results of Wilcoxon Test on the Effect of Elderly Gymnastics on Blood Pressure Reduction in Hypertensive Patients in North Cimpu Village, Suli District, Luwu Regency in 2025.

Blood Pressure	**Sig**	**Z _Wilcoxon**
Systolic	0,000	-4,078
Diastolic	0,000	-3,375

Source: Primary Data 2025

Based on Table 5. above, the results of the Wilcoxon Signed Test on systolic blood pressure before and after elderly gymnastics show a Z value of -4.078 and a ρ-value of 0.000 < 0.05, meaning that Ha is accepted, which means there is an effect of elderly gymnastics on systolic blood pressure in the elderly. The results of the Wilcoxon Signed Test on diastolic blood pressure before and after elderly gymnastics show a Z value of -3.375 and a ρ-value of 0.000 < 0.05, meaning that Ha is accepted, which means there is an effect of elderly gymnastics on diastolic blood pressure in the elderly.

DISCUSSION

1. Age

The frequency distribution results indicate that out of 21 respondents, the majority (66.7 percent) are aged between 41 and 50 years, totaling 14 individuals. Meanwhile, 6 respondents (28.6 percent) are aged 51 to 60, and only 1 respondent (4.82 percent) is over 60. According to the World Health Organization (WHO), individuals aged 60 years and above are categorized as elderly. This group is at the final phase of the human life cycle and undergoes the natural process of aging. At this stage, people often face challenges in meeting basic needs physically, mentally, and socially due to aging (Nugroho, 2019).

This study aligns with findings by Sitti Zulaika (2022), who reported that most participants were aged 50 to 60 (48.6 percent), followed by 60 to 70 years (42.9 percent), and over 70 years (8.6 percent). The likelihood of developing hypertension increases with age, although it can appear as early as age 35. A slight rise in blood pressure with age is considered normal due to physiological changes in the cardiovascular system and hormonal functions. However, when combined with other risk factors, these changes can lead to hypertension (Ekasari et al., 2019).

Based on these findings, the researcher concludes that the risk of hypertension rises with age, along with a decline in physical stamina.

2. Gender

Table 1.3 shows that out of 21 respondents, 17 (81.0 percent) are female and only 4 (19.0 percent) are male. In North Cimpu Village, Suli District, Luwu Regency in 2025, females made up the majority of the respondents. This high rate of hypertension among women is influenced by several factors, including hormonal changes especially the decrease in estrogen after menopause which can elevate blood pressure. Psychological factors may also play a role (Meliana, 2021).

The researcher concludes that women are more prone to hypertension, particularly due to hormonal fluctuations during menopause. This stage often brings about symptoms such as fatigue, insomnia, irregular menstruation, headaches, and hair thinning. Older women are at a greater risk of high blood pressure than men because the decline in estrogen removes a natural layer of protection for blood vessels.

These findings are consistent with Sitti Zulaika's (2022) study, which also reported that the majority of respondents (51.6 percent) were female. Additional studies by Cut Rahmiati and Tjut Irma Zurijah (2020) support this, with 78.79 percent of hypertensive patients being women. Kristiani and Dewi (2018) found similar results, noting that hypertension is more frequent among older women than men.

Solihin et al. (2020) noted that occupation also plays a role in hypertension. In this research, most hypertensive individuals were housewives. Similarly, Dachi et al. (2021) found that agricultural laborers formed the majority of hypertensive patients in their study.

3. Systolic Blood Pressure in the Elderly Before and After Doing Elderly Gymnastics

Research findings show that before participating in elderly gymnastics, the average systolic blood pressure among participants was 147.86 mmHg, with a median of 150.00 mmHg. The lowest recorded value was 140 mmHg and the highest was 160 mmHg. After performing elderly gymnastics, the average dropped to 137.38 mmHg, with a median of 135.00 mmHg, the lowest at 130 mmHg, and the highest at 150 mmHg.

Hypertension or high blood pressure refers to increased pressure in the arteries. The term "hypertension" comes from "hyper" meaning excessive and "tension" meaning pressure. It is a circulatory disorder where blood pressure exceeds normal levels (Musakka and Djafar, 2021). It is common in older adults and is a leading risk factor for strokes and heart disease. According to

Tarigan (2019), heart-related illnesses are responsible for over half of deaths in people over the age of 60.

Sartika (2020) found similar results, where elderly gymnastics reduced blood pressure. In her study, the intervention group experienced an average drop in systolic blood pressure of 21.00 mmHg, from 171.50 mmHg to 150.50 mmHg, and diastolic pressure decreased by 13.00 mmHg, from 103.00 mmHg to 90.00 mmHg.

These results suggest that prior to the exercise, participants' blood pressure levels fell within the hypertensive range. The data also suggest that women are at higher risk of elevated blood pressure due to menopause-related estrogen loss which reduces HDL levels in the blood, leading to narrowed blood vessels from fat buildup.

4. Diastolic Blood Pressure in the Elderly Before and After Doing Elderly Gymnastics

The study found that the average diastolic blood pressure before elderly gymnastics was 85.00 mmHg, with a median of 85.00 mmHg. The values ranged from 80 mmHg to 95 mmHg. After the exercise, the average decreased to 77.86 mmHg, with a median of 80.00 mmHg, ranging between 60 mmHg and 90 mmHg.

When the body is in a relaxed state, blood vessels widen, promoting better blood circulation, lowering central venous pressure (CVP), and improving heart performance. A decrease in CVP reduces cardiac output and mean arterial pressure. Veins have wider diameters than arteries and less resistance, which is why they function as capacitance vessels acting as blood reservoirs (Murtianingsih and Suprayitno, 2018).

Eviyanti (2020) found that elderly gymnastics significantly reduces diastolic blood pressure. In her study, average diastolic pressure before the exercise was 91.2 mmHg, which dropped to 89.2 mmHg afterward. Regular exercise done three times a week for 15 to 45 minutes is highly beneficial for controlling hypertension in older adults.

Elderly gymnastics has similar effects to beta blockers, calming the sympathetic nervous system by lowering its activity and hormone function. This leads to vasodilation or widening of the blood vessels which reduces cardiac output and in turn lowers blood pressure.

CONCLUSIONS

A. Conclusion

Based on the research results and discussion of this research, it can be concluded that there is an effect of decreasing blood pressure in elderly hypertensive patients before and after doing elderly gymnastics in North Cimpu Village, Suli District, Luwu Regency in 2025 with a value of (ϱ=0.000).

B. Suggestion

1. For respondents (Elderly)

The results of this research can be used as consideration for hypertensive patients to choose the right alternative treatment and practical in reducing blood pressure, which is expected by the elderly and their families to improve physical fitness through exercise patterns.

2. Research Location

For health workers (community health centers) in North Cimpu Village, it is expected to be more active in providing (Communication, Information, and Education) to the elderly about the importance of knowledge about physical fitness.

3. For institutions

It is expected that with this thesis, it can be used as a reference and utilized by students who will conduct further research to facilitate them in understanding the learning about the effect of elderly gymnastics on reducing blood pressure in hypertensive patients.

4. For future researchers

It is expected that future researchers can conduct further research on hypertension in the elderly using different research methods and exploring other variables that are more varied.

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