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The Relationship of Physical Activity and Hypertension in the Elderly at the Limboto Health Center, Gorontalo Regency

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ABSTRACT

Hypertension is one of the non-communicable diseases that is a global health problem because it can cause serious complications such as heart disease, stroke, and kidney failure. One of the factors that affect the increase in blood pressure is physical activity. Lack of physical activity can increase the risk of hypertension to a higher degree, especially in the elderly group. This study aims to determine the relationship between physical activity and the degree of hypertension in the elderly in the working area of the Limboto Health Center, Gorontalo Regency. The type of research used is quantitative with a correlational analytical design through a cross sectional approach. The study population was all Prolanis hypertension patients in the working area of the Limboto Health Center, with a sample of 75 respondents selected using the purposive sampling technique. The research instruments were in the form of physical activity questionnaires and blood pressure observation sheets. Data analysis was carried out using the Chi-Square test. The results showed that most of the respondents had poor physical activity as many as 44 respondents (58.7%) and the majority were in the category of degree 2 hypertension as many as 36 respondents (48.0%). The results of the statistical test showed a p-value of < 0.05, which means that there is a significant relationship between physical activity and the degree of hypertension. It was concluded that physical activity is related to the degree of hypertension in the elderly. People with hypertension are advised to increase physical activity regularly to help control blood pressure and prevent further complications.

INTRODUCTION

Hypertension is one of the non-communicable diseases that is currently still a serious problem in the health world, so hypertension can also be called a silent killer (Ramdhika et al., 2023). Hypertension is a condition when systolic blood pressure is more than 120 mmHg and diastolic pressure is more than 80 mmHg. Hypertension often causes changes in blood vessels that can result in higher blood pressure. Early treatment of hypertension is very important because it can prevent complications in several organs of the body such as the heart, kidneys, and brain (Wulandari et al., 2023).

Based on data from the World Health Organization (2023) an estimated 1.28 billion adults aged 30-79 years worldwide suffer from hypertension, mostly living in low- and middle-income countries, it is estimated that 46% of adults who suffer from hypertension are unaware that they have the condition. Hypertension is one of the global health problems that often goes undetected early, it often goes undetected due to a lack of regular check-ups and symptoms that are not seen in the early stages, although the impact can be very serious if not managed properly.

Hypertension or high blood pressure is a serious medical condition that significantly increases the risk of heart, brain, kidney, and other diseases. The incidence of hypertension in the world in 2021 is estimated to be as many as 1.28 billion adults aged 30-79 years worldwide suffering from hypertension, most (two-thirds) living in low- and middle-income countries(Wulandari et al., 2023). The high prevalence of hypertension is not

only found in developed countries, but also in developing countries such as Indonesia. From the Indonesian Basic Health Research, the prevalence of hypertension incidence is 34.1% (Ministry of Health, 2023).

Data from the Gorontalo Provincial Health Office in 2025 shows the results of screening elderly data in Gorontalo Province as many as 22,364 people. The elderly who suffer from hypertension are 8,944 people. Gorontalo Regency ranks first among the elderly affected by hypertension with a hypertension incidence rate of 4,357 people, followed by Bone Bolango Regency and North Gorontalo Regency. Based on these data, Gorontalo Regency is the main target to reduce the incidence of hypertension.

Data from the Gorontalo Regency Health Office in 2024 shows that the Limboto Health Center reached the first rank of 23 health centers in the Gorontalo Regency area as the most hypertensive health centers. Data from the 2025 Limboto Health Center showed that the number of elderly people with hypertension was 1,344 cases.

Hypertension is a disease that occurs due to an increase in blood pressure. In young adults, blood pressure is around 120/70 mmHg in the resting position. But physiologically, blood pressure varies from time to time due to several factors that affect (Zainuddin & Labdullah, 2020). Hypertension is affected by various risk factors that can be categorized into uncontrollable risk factors and controllable risk factors. Uncontrollable risk factors include age, gender, and family history of hypertension. The risk factors that can be controlled include smoking habits, consumption patterns of salt, saturated fat, coffee, and alcohol, physical activity levels, stress, and nutritional status such as obesity. (Ardiansyah & Widowati, 2024). These factors play an important role in increasing blood pressure, especially in the elderly age group. As we age, there is a decrease in the working function of the heart as well as the thickening of the arterial walls due to the accumulation of collagen in the muscle layer, which leads to narrowing and stiffening of blood vessels (Indriani et al., 2023).

This physiological condition makes the elderly more susceptible to an increase in blood pressure if accompanied by an unhealthy lifestyle, such as a lack of physical activity. Elderly people who are physically inactive tend to get tired easily, so the heart rate increases and triggers an increase in blood pressure due to increased cardiac workload and pressure on the arteries. Thus, physical activity is one of the important factors that need to be considered in efforts to prevent and control hypertension in the elderly (Mudalifa et al., 2025).

Doing regular physical activity in the elderly can help the heart work more optimally. Physical activity increases the energy needs of the body's cells, tissues, and organs, which in turn triggers increased respiratory activity and venous backflow. The increase in venous backflow caused the volume of the heart to increase, so that arterial blood pressure had experienced a moderate increase. However, after the activity phase ends, the body enters a resting phase where respiratory activity and the muscular system decrease. In this phase, sympathetic nerve activity and the secretion of the hormone epinephrine decrease, so that the frequency of the heartbeat slows down, vasodilation of blood vessels occurs, as well as a decrease in cardiac output and total peripheral resistance. These physiological processes ultimately contribute to the reduction and stabilization of blood pressure in the elderly who routinely engage in physical activity (Laughter) et al., 2020).

Based on previous research that has been conducted by (Jasmin et al., 2023) It was obtained that 73.4% of the elderly with less physical activity experienced hypertension while the elderly with good physical activity experienced hypertension as much as 29%. This means that the elderly with less physical activity have the potential to be 6,758 times more likely to experience hypertension than the elderly with good physical activity. This is supported by research (Zhang et al.,2024) in middle-aged and elderly adults in China showed that hypertensive patients who engaged in adequate daily physical activity were less likely to develop resistant hypertension. Specifically, patients who engaged in physical activity as recommended (such as regular exercise, leisurely walking, or cycling) had a 14% reduced risk of resistant hypertension compared to those who were less mobile. Therefore, people with hypertension are highly recommended to regularly do physical activity, as this helps control blood pressure and prevent the development of hypertension which is difficult to overcome.

The results of initial observations conducted by researchers at the Limboto Health Center, Gorontalo Regency, on September 12, 2025 through an interview method with elderly people with hypertension, information was obtained by 5 out of 10 respondents, stating that they routinely do physical activities such as lifting their livestock feed, some also run every morning and have controlled blood pressure. The other 3 respondents also did physical activity, but their blood pressure was not controlled due to non-compliance in taking medication and an unmaintained diet. Meanwhile, 2 people did less physical activity because they used wheelchairs, and their blood pressure was not controlled.

Based on the background description above, the researcher is interested in conducting research on the Relationship between Physical Activity and Hypertension in the Elderly at the Limboto Health Center.

RESEARCH METHODS

This research was carried out at the Limboto Health Center, Gorontalo Regency on November 2 - December 20, 2025. The type of quantitative research uses a cross-sectional method research design. Cross sectional design was used to determine the relationship between physical activity and hypertension simultaneously, where independent and dependent variable measurements were carried out simultaneously at

one time without follow-up. The sampling technique in this study used the purposive sampling technique, with a sample of 75 respondents. This study used a PASE (Phisycal Activity Scale Elderly) questionnaire to assess physical activity. and blood pressure measuring device (Sphygmomanometer).

RESEARCH RESULTS

Characteristics of respondents

Table 1 Characteristics of Respondents by Gender

Yes	Gender	N	%
1	Male	20	26,7
2	Women	55	73,3
Total		**75**	**100**

Based on table 1, it shows that most of the respondents are female, namely 55 respondents (73.3%).

Table 2 Characteristics of Respondents by Age

Yes	Age	N	%
1	46-55 years old	3	4,0
2	56-65 years old	36	48,0
3	> 65 years old	36	48,0
Total		**75**	**100**

Based on table 2, it was found that the age of the respondents was mostly in the range of 56-65 years (Late Elderly) and >65 years (Seniors) which amounted to 36 respondents (48%) each.

Table 3 Characteristics of Respondents by Education Level

Yes	Final Education	N	%
1	SD	30	40,0
2	Junior High School	27	36,0
3	High School	15	20,0
4	S1	3	4,0
Total		**75**	100

Based on table 3, it shows that the last education of the respondents was mostly at the elementary level with a total of 30 respondents (40%).

Table 4. Characteristics of Respondents Based on Drug Consumption

Yes	Drug Consumption	N	%
1	Routine	34	45,3
2	Not Routine	41	54,7
Total		**75**	**100**

Based on table 4, it shows that most of the respondents do not regularly take medication, namely 41 respondents (54.7%).

Table 5 Characteristics of Respondents Based on Smoking History

Yes	Smoking History	N	%
1	Yes	15	20,0
2	No	60	80,0
Total		**75**	100

Based on table 5, it shows that some respondents do not have a smoking history, namely as many as 60 respondents (80%).

Table 6 Distribution of Respondents by Hypertension Level

Yes	Hypertension Rate	N	%
1	Degree 1 140- 159/90-99 mmHg	34	45,3
2	Degree 2 160- 179/100-109 mmHg	37	49,3
3	Degree 3 >180/>110 mmHg	4	5,3
Total		**75**	**100**

Table 6 shows that the level of hypertension of respondents is mostly in the Degree 2 category with a total of 37 respondents (49.3%), followed by Degree 1 as many as 34 respondents (45.3%) and Degree 3 as many as 4 respondents (5.3%).

Table 7 Distribution of Respondents by Physical Activity

Yes	Physical Activity	N	%
1	Good Activity	31	41,3
2	Bad Activity	44	58,7
Total		**75**	**100**

Based on table 7, it shows that most of the respondents have a level of bad activity, which is as many as 44 respondents (58.7%), while other respondents with good activities amount to 31 respondents (41.3%).

Bivariate Analysis

Based on the results of the study, it was found that as many as 31 respondents had good physical activity, with 30 respondents (40%) in the category of degree 1 hypertension, 1 respondent (1.3%) in the category of degree 2 hypertension, and no respondents in the category of degree 3 hypertension (0%). Meanwhile, 44 other respondents had poor physical activity, of which as many as 4 respondents (5.3%) were in the category of degree 1 hypertension, 36 respondents (48%) in the category of degree 2 hypertension, and 4 respondents (5.3%) in the category of degree 3 hypertension.

In addition, the results of the statistical test using the Chi-Square test obtained a p-value of 0.000 which means ($p<0.05$) with a significance level of $\alpha= 0.05$. Therefore, it can be concluded that H0 is rejected and H1 is accepted, which means that there is a significant relationship between Physical Activity and Hypertension in the Elderly at the Limboto Health Center, Gorontalo Regency

DISCUSSION

Hypertension Rate in the Elderly at the Limboto Health Center, Gorontalo Regency

Based on The results of a study conducted on the elderly at the Limboto Health Center, Gorontalo Regency regarding the level of hypertension in the elderly showed that the blood pressure of the respondents was mostly at the level of Degree 2 Hypertension with the amount of 37 respondents (49.3%). When viewed from age, the majority of respondents were in the 56–65 years old group (the final elderly) and > 65 years old (seniors), each as many as 36 respondents (48.0%). This suggests that degree 2 hypertension is mostly found in the elderly age group. In this age group, the degenerative process in the cardiovascular system takes place more progressively. The walls of blood vessels undergo thickening and stiffening due to the buildup of collagen and calcium, so that peripheral resistance is significantly increased. This condition causes blood pressure to increase and is difficult to control, so the elderly are more susceptible to moderate hypertension (Promise, 2025).

As we age, there is a decrease in the working function of the heart and thickening of the arterial walls due to the accumulation of collagen in the muscle layer, which leads to narrowing and stiffening of blood vessels (Indriani et al., 2023). The increasing age of respondents can affect body functions, especially reducing the elasticity of blood vessels and decreasing the heart's ability to pump blood throughout the body (Yunding, Megawaty, and Aulia, 2021). In a study conducted by Rahmiati and Zurijah (2020), it was revealed that blood pressure in the elderly tends to increase, so the elderly have a higher risk of developing hypertension (high blood pressure). Increasing age causes an increase in blood pressure, because the arterial walls in the elderly will experience thickening and reducing the elasticity of blood vessels. This causes blood pressure to get higher, so blood vessels will gradually narrow and become stiffer.

This study is in line with the view of Herziana (2021), who states that individuals over 40 years old have a higher risk of developing hypertension than those under 40 years old. The walls of the arteries will thicken due to the accumulation of collagen in the muscle layers, resulting in narrowing and stiffening of the blood vessels.

Thus , researchers assume that age is an important factor related to the increase in the degree of hypertension in the elderly, so more intensive blood pressure control efforts are needed, especially in the elderly age group, through routine blood pressure monitoring, continuous health education, and the implementation of a healthy lifestyle to prevent the progression of hypertension to a more severe degree.

Followed by Grade 1 Hypertension Grade 1 Hypertension amounted to 34 respondents (45.3%). When viewed from the characteristics of the education level, most of the respondents in this study had the last level of elementary school (SD), which was 30 respondents (40.0%), followed by junior high, high school, and S1 education levels with a smaller number.

Height The proportion of the elderly with low levels of education who experience Degree 1 hypertension shows a relationship between levels of hypertension. Education and the individual's ability to understand and manage their health conditions. Education is an important factor that affects health literacy,

including understanding of hypertension risk factors, the importance of regular blood pressure checks, and the implementation of healthy living behaviors. (Suharto et al., 2023). This is in line with research by Sari and Putra (2023), which states that low levels of education are related to low adherence in carrying out health recommendations, so that an increase in blood pressure in the early stages is often unnoticed.

Another study by Indriani et al. (2023) also explains that individuals with low education have a higher tendency to detect hypertension late, due to the rarity of regular blood pressure checks. This condition causes hypertension to be identified only when blood pressure has experienced a continuous increase.

Based on the results of the study and supported by theoretical studies and previous research, the researcher assumes that the high number of elderly people with Degree 1 Hypertension in the low education group is related to the low level of health literacy of the respondents. Elderly with an elementary school education tend to have limitations in understanding health information, especially related to hypertension risk factors and the importance of blood pressure control from the early stages.

The results of the next study showed that as many as 4 respondents (5.3%) were in the category of Degree 3 Hypertension. This is because sufferers do not maintain their diet properly. When interviewed, some respondents stated that they often eat foods that contain high fat, such as fried and fatty foods. Sodium content is related to blood pressure in hypertensive patients, where eating foods that are high in fat, high in salt, and low in fiber are one of the causes of hypertension. Foods that contain too much fat can increase the risk of hypertension because they can cause cholesterol levels in the blood to rise. The cholesterol can stick to the walls of blood vessels, which over time can lead to blockages. This is caused by the virus being formed, which results in a narrowing of blood flow. As a result, blood volume and blood pressure will increase (Maqfirah, et al., 2024). In line with the results of research obtained by Hamzah, et al. (2021) at the Dungalio Health Center, diet has an effect on the incidence of hypertension. Irregular eating habits can lead to an increase in blood pressure, such as the consumption of high-fat foods, especially saturated fats and cholesterol (Hamzah, et al., 2021).

Researchers assume that the appearance of Degree 3 Hypertension in a small percentage of respondents is related to a poorly controlled diet, specifically the consumption of high-fat and high-salt foods. The habit of eating fried, fatty, and low-fiber foods is thought to contribute to a significant increase in blood pressure in the elderly.

Physical Activity in the Elderly at the Limboto Health Center, Gorontalo Regency

Based on the results of a study conducted on the elderly at the Limboto Health Center, Gorontalo Regency regarding the physical activity of the elderly, it showed that most of the respondents had a bad activity level, namely 44 respondents (58.7%), while other respondents with good activities amounted to 31 people (41.3%). The results of the data prove that more respondents have a level of bad activity, namely 44 people (58.7%).

In accordance with the research data, as many as 44 respondents (58.7%) were in the category of poor physical activity. The high proportion of respondents with poor physical activity shows that most of the elderly in this study have not implemented an active lifestyle in daily activities. These findings are in line with the results of filling out the Physical Activity Scale for the Elderly (PASE) questionnaire, which indicates low respondents' involvement in physical activity, both exercise and daily functional activities.

Based on respondents' answers to the PAE questionnaire, most of the elderly stated that in the past week they rarely or never did structured physical activity, "such as regular walking, light gymnastics, and other physical activities that involve continuous body movement". Respondents tended to spend most of their time with sedentary activities, such as "sitting for long periods of time, lying down, or watching television", so the body's energy use became very minimal. This condition reflects the low frequency and intensity of physical activity carried out by respondents.

In addition to the lack of physical activity, some respondents also revealed subjective complaints in the form of the body feeling weak easily and getting tired quickly, even though they only do light physical activity or for a short duration. These complaints show a decrease in endurance and functional capacity of the body, which ultimately further limits the ability of the elderly to perform physical movements. This situation can form a cycle, where physical limitations cause the elderly to be reluctant to move, and lack of movement actually worsens physical condition and body fitness.

The results of this study indicate that the majority of respondents with poor physical activity have not become accustomed to doing measurable and planned physical activity, both in the form of light exercise and household activities that involve active body movement. Elderly people tend to choose to limit body movements and engage in passive activities in daily life. A sedentary lifestyle that lasts for a long period of time has the potential to reduce physical fitness, accelerate the process of declining physiological function, and increase the risk of various health problems, including hypertension.

This is in line with research (Roslaini, Asniar, & Susanti, 2022) Lack of physical activity, low levels of physical fitness, and lack of direct interaction with others can lead to a decline in health status and functional abilities in the elderly. Seniors who have low physical activity for a long time may experience

decreased balance, muscle strength, and mobility. If the elderly do not do enough physical activity and only sit or lie down for a long period of time, it can result in stiffness in the muscles and joints, which in turn can interfere with balance when walking and standing.

Thus, these findings show that the level of physical activity of the elderly at the Limboto Health Center is still relatively low, which is reflected in the dominance of respondents with the category of poor physical activity. These conditions need to be a concern in promotive and preventive efforts, especially through health education and nursing interventions that encourage the elderly to increase physical activity gradually and in accordance with their physical abilities.

According to the researchers' assumptions, the low physical activity in the elderly in this study is influenced by sedentary living habits, such as spending more time sitting and watching television, as well as physical limitations that cause the elderly to tend to limit body movements in daily activities.

In addition to the results of the study on respondents with poor physical activity, this study also found respondents with good physical activity, which amounted to 31 respondents (41.3%). These results are in line with respondents' answers to the Physical Activity Scale for the Elderly (PASE) questionnaire, which illustrates that respondents in this category routinely do physical activity, both in the form of light exercise and daily functional activities. Based on filling out the questionnaire, most respondents stated that they did physical activities such as "leisurely walking, light gymnastics, or household activities" that involve active body movements with a frequency of about 3 to 5 times in one week and a sufficient duration. This shows that respondents have a habit of staying active even at an advanced age.

In addition to doing structured physical activity, respondents with good physical activity also reported that they spent a lot of time actively in carrying out daily routines, such as cleaning the house, light gardening, or doing social activities that require mobility. Respondents in this group also revealed that their body condition felt fitter and did not get tired easily when doing physical activity, which reflected the existence of a well-maintained immune system and functional capacity.

Physical activity in the elderly can improve health, reduce the risk of various diseases, and improve a person's quality of life. Physical activity carried out by the elderly affects changes in the strength of the heart muscle, so that the heart rate can become strong and regular (Ariyanto et al., 2020). Examples of daily activities related to physical activity include shopping, doing light activities, cleaning the house, washing clothes, and so on. Generally, the elderly in undergoing physical activity face various obstacles, caused by stiff joints, limited movement, slow reaction time, unstable conditions when walking, poor body balance, and problems with blood circulation (Roslaini, Asniar, & Susanti, 2022).

These findings are supported by research (Roslaini, Asniar, & Susanti, 2022) which states that the elderly who do regular physical activity tend to have better physical fitness, maintained muscle strength, and more optimal functional abilities compared to the elderly who are less physically active. Physical activity that is done consistently, even with light to moderate intensity, plays an important role in maintaining body stamina and preventing a decline in physical function.

According to the researchers' assumptions, good physical activity in the respondents in this study is influenced by the elderly's awareness of the importance of maintaining health and fitness, as well as the existence of active lifestyle habits that have been applied consistently in daily life. Elderly people who are used to doing scheduled physical activity tend to have a positive perception of the benefits of physical activity, so they are able to maintain an active lifestyle even in old age.

The Relationship between Physical Activity and Hypertension in the Elderly at the Limboto Health Center, Gorontalo Regency

Based on the results of bivariate analysis using the Chi-Square test, a p-value of 0.000 ($p<0.05$) was obtained, which means that there is a significant correlation between independent variables (physical activity) and dependent variables (hypertension). From these results, it can be assumed that H0 is rejected and H1 is accepted, which means that there is a significant relationship between Physical Activity and Hypertension in the elderly at the Limboto Health Center, Gorontalo Regency. The same results were also found in a study conducted by Sofianita, Supriyatna, & Novinda (2025) that physical activity is the most influential factor in controlling blood pressure. People who have good physical activity habits have a 24 times greater chance of controlling blood pressure compared to those who are less active, as physical activity can improve cardiovascular function and vascular elasticity thus helping to regulate blood pressure physiologically. Another study also conducted by Syifa & MS (2025) found that there was a significant relationship between physical activity levels and blood pressure in hypertensive elderly; Respondents who had moderate to high physical activity were more likely to have controlled blood pressure compared to those who were less active ($p <.001$).

Based on the results of the research analysis, it was known that as many as 30 respondents with good physical activity were in the category of degree 1 hypertension. This condition can be attributed to the characteristics of the respondents based on the history of not smoking, where the majority of respondents in this study stated that they did not have a smoking habit.

Based on the theory, smoking is one of the main risk factors for hypertension. The nicotine content in cigarettes can cause vasoconstriction of blood vessels, increased heart rate, and stimulation of the sympathetic nervous system which leads to an increase in blood pressure. Exposure to toxic substances in cigarettes also contributes to endothelial damage of blood vessels and decreased arterial elasticity. In contrast, individuals with a history of nonsmoking tend to have better vascular function and more stable blood pressure. In addition, regular physical activity plays a role in increasing heart capacity, lowering peripheral resistance, and helping to control blood pressure, so that it can prevent the worsening of hypertension to a more severe degree.

Some Research The most recent study showed a link between smoking status and hypertension incidence. A study in the Working Area of the Gang Kelor Health Center in the elderly Find that smoking habits are significantly related to the incidence of hypertension and physical activity is also related to hypertension in the elderly (Agustiani et al., 2023).

Research Another study in Indonesia also analyzed the relationship between age, smoking, and physical activity to the incidence of hypertension, and confirmed that smoking is one of the factors that contribute to the incidence of hypertension, although the context is different in the adult male population (Anisah et al., 2025).

Other research results were found that there were 4 respondents with poor physical activity who were in the category of degree 1 hypertension. This condition shows that even though the respondents have a low level of physical activity, the blood pressure experienced is still at a mild degree, althoughit is associated with the characteristics of the respondents based on the consumption of antihypertensive drugs, it is known that some respondents still routinely take medication as recommended by health workers. Based on the demographic table of drug consumption, respondents who take medication regularly tend to have more controlled blood pressure, so even if the physical activity of the respondents is poor, an increase in blood pressure to a heavier degree can be prevented.

Regular consumption of antihypertensive drugs plays a role in lowering blood pressure by reducing blood vessel resistance and reducing the workload of the heart. Therefore, regular treatment can help maintain blood pressure in the category of degree 1 hypertension even though other risk factors, such as low physical activity, are still found in respondents.

The results of this study are in line with research conducted by Wulandari et al. (2023) which stated that adherence in taking antihypertensive drugs plays an important role in keeping blood pressure controlled in hypertensive patients. Another study by Sari and Putri (2022) also explained that hypertensive patients who routinely take medication tend to be in the category of mild hypertension compared to patients who do not routinely take medication.

Thus, the results of this study show that regular consumption of antihypertensive drugs can be a supporting factor that explains why respondents with poor physical activity are still in the category of degree 1 hypertension.

The results of another study found that there were 36 respondents with poor activity in the category of degree 2 This condition shows that low physical activity accompanied by other supporting factors can contribute to an increase in the degree of hypertension in the elderly, if it is associated with the characteristics of the respondentsBased on the consumption of antihypertensive drugs, it is known that most respondents in the category of degree 2 hypertension do not routinely take drugs as recommended by health workers. Based on the demographic table of drug consumption, respondents who are irregular or do not take antihypertensive drugs tend to experience uncontrolled blood pressure, so they are in the category of moderate hypertension. Non-compliance in the consumption of antihypertensive drugs causes the blood pressure control mechanism to not work optimally. As a result, even if respondents did not engage in enough physical activity, blood pressure remained elevated and difficult to control, potentially progressing from mild to higher degree hypertension.

The results of this study are in line with research conducted by Wulandari et al. (2023) which stated that non-compliance with the consumption of antihypertensive drugs is related to an uncontrolled increase in blood pressure in hypertensive patients. Another study by Sari and Putri (2022) also explained that hypertensive patients who do not routinely take medication have a higher risk of developing moderate to severe hypertension compared to patients who comply with treatment. Thus, the results of this study show that irregular consumption of antihypertensive drugs is a supporting factor that can explain why respondents with poor physical activity tend to be in the category of degree 2 hypertension.

Other research results are known that there are 4 respondents with poor physical activity who are in the category of degree 3 hypertension. This condition shows that in certain respondents, hypertension has progressed to a severe degree. During the data collection process, the researcher also obtained additional information informally through brief communication with several respondents. From these communications, there were respondents who said that they had family members, such as parents or siblings, who also suffered from hypertension. This information is not recorded as research data and is not statistically analyzed, but is considered by researchers in explaining possible genetic factors that play a role in the occurrence of severe hypertension.

Genetic factors or family history are one of the risk factors that can affect the occurrence of hypertension. Individuals with History Hypertensive families have a greater tendency to experience blood pressure regulation disorders, so blood pressure increases more easily and is difficult to control. This condition can aggravate the degree of hypertension, especially when accompanied by other risk factors such as poor physical activity (Syaidah Marhabatsar & Sijid, 2021).

These results are in line with research conducted by Syaidah Marhabatsar and Sijid (2021) which states that individuals with a family history of hypertension have a higher risk of experiencing moderate to severe hypertension. Another study by Mills et al. (2020) also explains that genetic factors play a role in the progression of hypertension, especially in individuals with sedentary lifestyles.

Thus , although genetic factors were not directly measured in this study, the presence of respondents with poor physical activity who were in the category of degree 3 hypertension could be explained theoretically through the influence of genetic factors supported by the literature and additional information obtained by the researchers during data collection.

The researchers hypothesized that grade 3 hypertension in respondents with poor physical activity was likely influenced by genetic factors or a family history of hypertension that were not quantitatively measured in the study. Additional information obtained informally during data collection supports this assumption, so genetic factors are seen as supporting factors that could theoretically explain the occurrence of severe hypertension.

CONCLUSION

Hypertension at the Limboto Health Center is mostly in the Degree 2 category with a total of 37 people, followed by Degree 1 as many as 34 people, and Degree 3 as many as 4 people.

The results of the study conducted on the elderly at the Limboto Health Center, Gorontalo Regency, regarding the physical activity of the elderly, most of the respondents had a poor activity level, namely 44 respondents (58.7%), while other respondents with good activities amounted to 31 people (41.3%).

There is a significant relationship between Physical Activity and Hypertension in the elderly at the Limboto Health Center, Gorontalo Regency.

ADVICE

Based on the high incidence of hypertension in the elderly and the significant relationship between physical activity and hypertension rates at the Limboto Health Center, Gorontalo Regency, targeted follow-up is needed to improve hypertension control and the quality of life of the elderly.

For health centers

It is hoped that it can compile and optimize simple educational guidelines related to physical activities that are safe and appropriate for the elderly with hypertension, as well as integrate them into promotive and preventive programs such as Prolanis to improve the quality of health services.

For Health Workers

Health workers, especially nurses, are expected to conduct regular physical activity and blood pressure assessments and provide ongoing education on the importance of physical activity as a non-pharmacological effort in controlling hypertension in the elderly.

For the elderly and families

The elderly and their families are expected to play an active role in monitoring blood pressure, increasing physical activity regularly according to ability, and complying with the recommendations of health professionals to prevent hypertension complications.

For Educational Institutions

This research is expected to be a source of reference and material for the development of community nursing science, especially related to efforts to control hypertension in the elderly through a physical activity approach.

For the Next Researcher

Researchers are further advised to examine other factors related to hypertension in the elderly, such as diet, medication adherence, stress, and nutritional status, as well as using a broader or longitudinal research design.

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