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The Relationship Between Physical Activity in the Elderly and Hypertension in North Aceh

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ABSTRACT

Background: Physical activity plays an important role in maintaining health, improving quality of life, and preventing non-communicable diseases, including hypertension, among older adults. Objective: This study aimed to analyze the determinants of physical activity among older adults with hypertension in North Aceh. Method: A quantitative analytical study with a cross-sectional design was conducted involving 221 older adults with hypertension selected through simple random sampling. Data were collected using a demographic questionnaire, the International Physical Activity Questionnaire (IPAQ), and the Stopping Elderly Accidents, Deaths, and Injuries (STEADI) questionnaire. Results: The findings showed significant associations between physical activity and gender (p = 0.04), number of family members (p = 0.02), and risk of falling (p < 0.001). Conclusion: Gender, family size, and risk of falling were significantly associated with physical activity among older adults with hypertension. Public Health Centers (Puskesmas) and relevant stakeholders should consider these factors when developing interventions to promote physical activity and improve the quality of life of older adults with hypertension in North Aceh.

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INTRODUCTION

Physical activity is widely recognized as an essential component of healthy aging. The World Health Organization (WHO, 2020) recommends regular physical activity among older adults because of its positive effects on health and overall well-being. Physical activity can improve physical fitness, reduce the risk of various diseases, and enhance quality of life (Borjesson et al., 2015). Regular physical activity also plays an important role in the prevention and management of non-communicable diseases

(NCDs), including hypertension (Purnama & Suhada, 2019). Among older adults, physical activity contributes to maintaining cardiovascular function and muscle strength, although acute physical activity may temporarily increase blood pressure. Makawekes et al. (2020) reported that mean blood pressure increased from 142.25 mmHg before activity to 159.81 mmHg afterward, highlighting the importance of appropriate exercise intensity and monitoring among individuals with hypertension.

Hypertension remains a major global health problem, particularly among older adults. Previous reports estimated that approximately 978 million people worldwide were living with hypertension, representing 26.4% of the global population, with the prevalence projected to increase further (Sari et al., 2020). The burden is particularly high in developing countries, including Indonesia (Yonata & Pratama, 2016). In Indonesia, hypertension prevalence increases with age, reaching 45.9% among individuals aged 55–64 years and 57.6% among those aged 65–74 years (Infodatin, 2016). In addition, insufficient physical activity remains a public health concern. Riskesdas (2018) reported that 31.4% of individuals aged 60–64 years and 47.9% of those aged 65 years and older had insufficient physical activity. The prevalence of insufficient physical activity in Aceh Province was reported at 35.8%. Furthermore, the prevalence of hypertension in Aceh reached 34.1%, while hypertension among older adults was reported at 22.3% (Aceh Health Office, 2019).

At the local level, data from the North Aceh Health Office (2020) recorded 1,284 older adults with hypertension. This situation highlights the need to understand the factors associated with physical activity among older adults living with hypertension. Physical activity may be influenced by several determinants, including demographic characteristics, family support, and physical health conditions. Chunhua (2016) found that individuals aged over 60 years had a greater likelihood of meeting recommended weekly physical activity levels. Iswahyuni (2017) also reported an association between physical activity and hypertension, including both systolic and diastolic blood pressure. Furthermore, Giné-Garriga et al. (2014) and Gobbo et al. (2014) demonstrated that higher levels of physical activity were associated with reduced morbidity, mortality, and fall risk among older adults.

Family support and environmental factors may also influence older adults' participation in physical activity. Bungsu et al. (2019) found that caregiver behavior influenced the implementation of physical exercise among older adults with hypertension. Similarly, Nissen (2016) emphasized the importance of family attention and support in caring for family members. These findings suggest that physical activity among older adults is not determined solely by individual characteristics but may also be influenced by family circumstances and physical limitations, including the risk of falling.

Despite previous studies examining physical activity and hypertension, further investigation is needed to identify the factors associated with physical activity among older adults with hypertension, particularly in

North Aceh. Understanding these determinants is important for developing appropriate interventions that consider individual characteristics, family support, and fall risk. Therefore, this study aimed to analyze the determinants of physical activity among older adults with hypertension in North Aceh. The findings are expected to provide useful information for Public Health Centers (Puskesmas) and healthcare professionals in designing effective physical activity programs to support blood pressure management and promote healthy aging.

METHOD

This study employed an analytical research design with a cross-sectional approach. The study was conducted at Nisam Public Health Center (Puskesmas Nisam), North Aceh, from January 10 to 28, 2026. A total of 221 older adults with hypertension in North Aceh were recruited using a simple random sampling technique. Data were collected using the International Physical Activity Questionnaire (IPAQ) developed (Craig et al, 2003) and the Stopping Elderly Accidents, Deaths, and Injuries (STEADI) questionnaire (Eckstrom, Parker, Shakya, and Lee, 2021).

RESULT AND DISCUSSION

The study was conducted at Dewantara Public Health Center (Puskesmas Dewantara), North Aceh, in January 2026. The results are presented as follows:

Table 1. Distribution of Demographic Characteristics, Fall Risk, and Physical Activity Among Older Adults

Variables	Frequency (n)	Percentage (%)
Age		
60–70 years	215	97.3
>70 years	6	2.7
Gender		
Female	127	57.5
Male	94	42.5
Education level		
Primary	163	73.8
Secondary	43	19.5
Higher	15	6.8
Number of family members		
None	41	18.6
One person	53	24.0
>2 people	127	57.5
Blood pressure		
150 mmHg	111	50.2
Fall risk		
No risk	93	42.1
At risk	128	57.9
Physical activity		
Low	36	16.3

Moderate	65	29.4
High	120	54.3
Total	**221**	**100.0**

Table 2. Association Between Age and Physical Activity Among Older Adults with Hypertension

Characteristics	Physical Activity						P
	Low		Moderate		High		
	f	%	F	%	F	%	
Age							
60-70 Years Old	32	15	64	29.8	119	55.3	0.09
> 70 Years Old	4	67	1	16.7	1	16.7	

Table 3. Determinants of Physical Activity Among Older Adults with Hypertension

Variable	Low		Moderate		High		*OR*	*P*
	f	%	f	%	f	%		
Gender								0.04
Female	21	16.5	29	22.8	77	60.6		0.55
Male	15	16.0	36	38.3	43	45.7		
Education								0.05
Basic	21	12.9	49	30.1	93	56.1		
Middle	9	20.9	11	25.6	23	53.5		
High	6	40.0	5	33.3	4	26.7		
Family								0.02
None	2	4.9	9	22.0	30	73.2		
1 Person	7	13.2	21	39.6	25	47.2		
> 2 Persons	27	21.3	35	27.6	65	51.2		
Blood Pressure (mmhg)								0.13
<130	13	21.3	21	34.4	27	44.3		
130-150	8	10.3	26	33.3	44	56.4		
>150	15	18.3	18	22.0	49	59.8		
Fall Risk								0.00
No Risk	26	28.0	34	36.6	33	35.5		0.16
Risk	10	7.8	31	24.2	87	68.0		

Table 1 shows that most respondents were aged 60–70 years (97.3%), female (57.5%), had primary education (73.8%), lived with more than two family members (57.5%), and had blood pressure levels above 150 mmHg (50.2%). Regarding fall risk, 128 respondents (57.9%) were classified as being at risk of falling, while 93 respondents (42.1%) had no risk of falling. Furthermore, 120 older adults (54.3%) demonstrated high levels of physical activity.

Tables 2 and 3 show significant associations between gender, number of family members living with older adults, and fall risk with physical activity among older adults with hypertension. The findings also indicate that high levels of physical activity were observed among respondents aged 60–70 years (55.3%), females (60.6%), those with primary education (56.1%), those living with more than two family members (51.2%), those with blood pressure above 150

mmHg (59.8%), and those at high risk of falling (68.0%). These findings highlight the need for attention from nurses and relevant healthcare professionals. Although these older adults demonstrated high levels of physical activity, their elevated fall risk and high blood pressure require appropriate supervision. Family members, community health workers, and healthcare providers should monitor their blood pressure regularly using a mercury sphygmomanometer or other validated blood pressure monitoring devices. Based on Table 2, age was not significantly associated with physical activity among older adults with hypertension (p = 0.09).

ASSOCIATION BETWEEN AGE AND PHYSICAL ACTIVITY AMONG OLDER ADULTS WITH HYPERTENSION

This finding is consistent with Chunhua (2016), who reported that individuals aged over 60 years were more likely to engage in physical activity. In the present study, 55.3% of respondents aged 60–70 years demonstrated high levels of physical activity. However, the statistical analysis showed no significant association between age and physical activity among older adults with hypertension (p = 0.09). This may be related to the daily activities of older adults in Dewantara District, including trading, farming, and gardening. These activities may involve considerable physical effort and contribute to higher levels of physical activity regardless of age. Regular and appropriate physical activity may help manage blood pressure among older adults with hypertension. Furthermore, Diaz (2017) reported that age influences physical activity patterns and that individuals aged 60 years and older may experience increased blood pressure and other health complications when physical activity is insufficient. Participation in weekly or monthly activities organized by Public Health Centers (Puskesmas), particularly through integrated health services for older adults (Posyandu Lansia), may help monitor blood pressure and maintain health during aging.

ASSOCIATION BETWEEN GENDER AND PHYSICAL ACTIVITY AMONG OLDER ADULTS WITH HYPERTENSION

The findings showed that female respondents had a higher proportion of high physical activity (60.6%). Statistical analysis indicated a significant association between gender and physical activity among older adults with hypertension. This finding may be related to differences in daily activity patterns between males and females. Older women may perform several household and social activities within the same period, contributing to their overall physical activity levels.

In this study, females constituted the majority of respondents and demonstrated relatively high levels of physical activity. Their involvement in various daily activities may explain the observed

association between gender and physical activity. However, the intensity and duration of these activities should also be considered when evaluating their potential health benefits and risks, particularly among older women with hypertension.

ASSOCIATION BETWEEN EDUCATION LEVEL AND PHYSICAL ACTIVITY AMONG OLDER ADULTS WITH HYPERTENSION

The study found that respondents with primary education had the highest proportion of high physical activity (56.1%). This finding indicates that older adults with lower educational attainment can remain physically active despite their limited formal education. Educational level may influence health knowledge and awareness; however, it does not necessarily determine an individual's ability or willingness to engage in daily physical activities. Older adults with primary education may continue participating in household, agricultural, and community activities as part of their daily routines.

ASSOCIATION BETWEEN NUMBER OF FAMILY MEMBERS AND PHYSICAL ACTIVITY AMONG OLDER ADULTS WITH HYPERTENSION

Living alone or without family support may negatively affect the health of older adults. Their daily physical activities may not be adequately monitored by family members. Therefore, family support is essential for older adults with hypertension, particularly in supervising their physical activities and maintaining their health. Bungsu, Rekawati, and Wiarsih (2019) found that caregiver behavior influenced the implementation of physical exercise among older adults with hypertension. In the present study, respondents living with more than two family members had the highest proportion of high physical activity (51.2%). Statistical analysis demonstrated a significant association between the number of family members and physical activity among older adults. Family involvement may help monitor daily activities, provide assistance when needed, and reduce potential health risks. Therefore, family support plays an important role in promoting safe and appropriate physical activity among older adults with hypertension.

ASSOCIATION BETWEEN FALL RISK AND PHYSICAL ACTIVITY AMONG OLDER ADULTS WITH HYPERTENSION

The findings showed that older adults at risk of falling had a higher proportion of high physical activity (68.0%). Statistical analysis indicated a significant association between fall risk and physical activity among older adults with hypertension. These findings highlight the importance of family supervision and maintaining physical balance to minimize the risk of falls and their potentially serious consequences. Falls and their related consequences are among the major health concerns affecting older

adults (Howard, Beitman, Walker, & Moore, 2016; Kenny, Romero-Ortuno, & Kumar, 2017). Prolonged physical inactivity may lead to decreased balance, muscle strength, and mobility, thereby increasing the risk of falls and the severity of fall-related consequences (Ambrose, Cruz, & Paul, 2015; Duray & Genç, 2017; Smee et al., 2017). Conversely, adequate physical activity and better physical fitness may contribute to fall prevention among older adults (Furtado, Sousa, Simão, Pereira, & Vilaça-Alves, 2015; Pereira, Baptista, & Infante, 2014). Therefore, physical activity programs for older adults with hypertension should be adjusted to their physical abilities and fall risk, with appropriate supervision from family members and healthcare professionals.

CONCLUSION

There were significant associations between gender, education level, number of family members, and fall risk with physical activity among older adults with hypertension. Regular physical activity may improve quality of life and support blood pressure management in older adults. Therefore, older adults require attention and support from families, nurses, and other healthcare professionals. Community nurses should be provided with appropriate training and guidance to identify and manage factors influencing physical activity, ensuring that older adults can remain physically active and safe.

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REFERENCES

Ambrose, A. F., Cruz, L., & Paul, G. (2015). Falls and Fractures: A systematic approach to screening and prevention. *Maturitas*, Vol. 82, pp. 85–93. https://doi.org/10.1016/j.maturitas.2015.06.035.

Arija, V., Villalobos, F., Pedret, R., Vinuesa, A., Jovani, D., Pascual, G., & Basora, J. (2018). Physical activity, cardiovascular health, quality of life and blood pressure control in hypertensive subjects: randomized clinical trial. *Health and Quality of Life Outcomes*, *16*(1), 1–11. https://doi.org/10.1186/s12955-018-1008-6.

Ariyanto, A., Puspitasari, N., Utami, D. N., & Yogyakarta, U. A. (2020). Aktivitas fisik terhadap kualitas hidup pada lansia. *Kesehatan Al-Irsyad*, *XIII*(2), 145–151.

Berman, A., Snyder, S., & Frandsen, G. (2016). Kozier and Erb's Fundamentals of Nursing: concepts, process and practice. In

Nurse Education in Practice (10th ed., Vol. 12). https://doi.org/10.1016/j.nepr.2011.09.002.

Börjesson, M., Onerup, A., & Dahlöf, B. (2015). Aerobic physical activity lowers blood pressure in hypertension. *Europe PMC*.

Bungsu, P. P., Rekawati, E., & Wiarsih, W. (2019). Elderly care givers behavior associated with physical exercise implementation among elderly with hypertension. *Enfermeria Clinica*, *29*, 585–587. https://doi.org/10.1016/j.enfcli.2019.04.090.

Chunhua. (2016). The Evaluation of Physical Activity for Community- dwelling patisnts with hypertension. *International Journal of Laboratory Hematology*, *38*(1), 42–49. https://doi.org/10.1111/ijlh.12426.

Craig, C. L., Marshall, A. L., Sjöström, M., Bauman, A. E., Booth, M. L., Ainsworth, B. E., … Oja, P. (2003). International physical activity questionnaire: 12-Country reliability and validity. *Medicine and Science in Sports and Exercise*, *35*(8), 1381–1395. https://doi.org/10.1249/01.MSS.0000078924.61453.

Diaz, K. M., Booth, J. N., Seals, S. R., Abdalla, M., Dubbert, P. M., Sims, M., … Shimbo, D. (2017). Physical activity and incident hypertension in African Americans. *Hypertension*, *69*(3), 421–427. https://doi.org/10.1161/HYPERTENSIONAHA.116.08398.

Duray, M., & Genç, A. (2017). The relationship between physical fitness and falling risk and fear of falling in community-dwelling elderly people with different physical activity levels. *Turkish Journal of Medical Sciences*, *47*(2), 455–462. https://doi.org/10.3906/sag-1511-101.

Eckstrom, E., Parker, E. M., Shakya, I., & Lee, R. (2021). *Coordinated Care Plan to Prevent Older Adult Falls*.

Furtado, H. L., Sousa, N., Simão, R., Pereira, F. D., & Vilaça-Alves, J. (2015). Physical exercise and functional fitness in independently living vs institutionalized elderly women: A comparison of 60- to 79-year-old city dwellers. *Clinical Interventions in Aging*, *10*, 795–801. https://doi.org/10.2147/CIA.S80895

Giné-Garriga, M., Roqué-Fíguls, M., Coll-Planas, L., Sitjà-Rabert, M., & Salvà, A. (2014). Physical exercise interventions for improving performance-based measures of physical function in community-dwelling, frail older adults: A systematic review and meta-analysis. *Archives of Physical Medicine and Rehabilitation*, *95*(4). https://doi.org/10.1016/j.apmr.2013.11.007.

Gobbo, S., Bergamin, M., Sieverdes, J. C., Ermolao, A., & Zaccaria, M. (2014). Effects of exercise on dual-task ability and balance in older adults: A systematic review. *Archives of Gerontology and Geriatrics*, *58*(2), 177–187. https://doi.org/10.1016/j.archger.2013.10.001.

Grimby, G., Börjesson, M., Jonsdottir, I. H., Schnohr, P., Thelle, D. S., & Saltin, B. (2015). The "Saltin-Grimby Physical Activity Level Scale" and its application to health research. *Scandinavian Journal of Medicine and Science in Sports*, *25*, 119–125. https://doi.org/10.1111/sms.12611.

Howard, B. S., Beitman, C. L., Walker, B. A., & Moore, E. S. (2016). Cross-cultural Educational Intervention and Fall Risk Awareness. *Physical and Occupational Therapy in Geriatrics*, *34*(1), 1–20. https://doi.org/10.3109/02703181.2015.11