



**THE RELATIONSHIP BETWEEN COGNITIVE DISORDERS AND PHYSICAL ACTIVITY OF THE ELDERLY AND NON-COMMUNICABLE DISEASES ON THE RISK OF FALLS IN THE ELDERLY**

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**ABSTRACT**

Aging is a life process characterized by a decrease in the body's ability to adapt to the environment. As humans age, there will be a degenerative aging process that will have an impact on changes in humans not only physically but also cognitively. Decreased physical and cognitive function gives rise to several diseases in the elderly that are not contagious. Problems that are often experienced by the elderly are often associated with the aging process, one of which is cognitive function. Which is marked by obstacles in carrying out daily tasks. Method: The research method used a cross-sectional research design. The sample in this study was elderly from 60 – 85 years old, using a simple random sampling technique. Results using the mann whitney test showed a probability value of  $p: 0.005$  that was smaller than the significant standard of  $\alpha = 0.05$ .  $H_1$  is accepted, which means that there is a relationship between cognitive disorders and physical activity of the elderly with non-communicable diseases to the risk of falling in the elderly.

Keywords: cognitive disorders; elderly; physical activity

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**INTRODUCTION**

Aging is a process of growth and development. Humans develop from infants, children, adults and to old age. The elderly experience physical changes and cognitive impairments that are slowly decreasing (Arneliwati, 2020). The development of the elderly will undergo changes both physically, mentally and psychosocially. The older you get, the more physical abilities will decrease (Eni & Safitri, 2020). The decline in physical ability and causes a risk of falling, will increase dependence on needing the help of others. The risk of falling is very low in the elderly with the ability to do physical activity is recommended to increase physical activity (Juwariyah et al., 2023). The significant increase in the number of elderly people in Indonesia has resulted in Indonesia being ranked 5th in the world. According to a report from the United Nations in 2011, in 2000-2005 the life expectancy reached 66.4 years with the percentage of the elderly in 2000 being 7.74%. Every year this figure continues to increase from 2045 – 2050 which is estimated to be 77.6 years with the percentage of the elderly population in 2045 to be 28.68% (Imam Subekti et al., 2020).

Cognitive disorders are a person's ability to recognize and interpret the environment in the form of attention, language, memory, visual spatial, as well as decision-making functions. The initial symptoms of cognitive disorders are often found with forgetfulness symptoms that cause the elderly to be unable to say using the right words (Cahyaningrum, 2022). Furthermore, it is difficult to recognize objects to the point of not being able to use even simple things (Ramli & Masyita Nurul Fadhillah, 2022). Impaired cognitive function in the long term and not optimally handled will interfere with daily activities (Syah & Febriyeni

Utami, 2021). Physical activity is any body movement produced by the muscles of the body and produces energy, both light, medium and heavy. Each activity that requires different energy depends on the length of the intensity and muscle work (Leton et al., 2022). Physical activity is able to prevent diseases that are often experienced by the elderly, including non-communicable diseases and improve mental health to maintain balance, reduce the risk of falling, and can maintain and improve body control (Devi, 2020). The risk of falling is a threat to the elderly, so there is a need for continuous education for the elderly so that the elderly understand the signs of symptoms early. It is hoped that the elderly can train their respective muscles to care more so that the risk of emergency falls on the elderly due to cognitive disorders and physical activity does not become a major threat to the elderly (Fatimah & Nuryaningsih, 2021). It is important to hold counseling about daily activities so that the community as the closest people around the elderly better understand and can recognize the triggering factors for the occurrence of cognitive disorders and physical activities. This research is to encourage and support physical activity to increase energy expenditure so that there is no risk of falling in the elderly (Imam Subekti et al., 2020). The aim of this research is to determine the relationship between cognitive disorders and physical activity with non-communicable diseases in relation to the risk of falls in the elderly

**METHOD**

This type of research is quantitative by using a descriptive correlation method with a cross sectional design, which is a study that studies the dynamics of correlation between risk factors and effects by approaching, observing or collecting data at the same time. The data collection tool uses the Mini Mental State Examination (MMSE) assessment format, which is to measure cognitive aspects such as orientation, registration, attention and calculation as well as memory and language. a tool to measure daily activities using the Katz index. The tool to measure the risk of falling is to use a balance assessment format, which is to measure changes in position or movement of balance and components of gait or movement in the elderly. There were 96 respondents with simple random sampling with the measurement tool used was a questionnaire. The research site was conducted in the area of the Krobokan Semarang Health Center.

**RESULT**

Table 1.  
Respondent data by age (n= 96)

age	f	%
60 – 74 year	67	69,79
75 – 89 year	26	27,08
≥ 90 year	3	3,12

Based on the table above, the distribution of elderly frequencies based on the age of the respondents is most commonly found in the elderly with an average age of 60-74 years.

Table 2.  
Respondent data by gender (n= 96)

Gender	f	%
Male	37	38,54
Woman	57	61,46

Based on the table above, the distribution of elderly frequencies based on gender, respondents are most commonly found in the elderly with the average female gender.

Table 3.  
Respondent data based on education (n= 96)

Education	f	%
No school	37	5,21
Elementary school	57	56,13
Secondary school	27	28,13
High school	7	7,29
Bachelor	3	3,12

Based on the table above, the distribution of elderly frequencies based on the education of the respondents is most found in the elderly with an average elementary school education equivalent.

Table 4.  
Frequency Distribution of Respondents by Cognitive Disorders (n= 96)

Cognitive Disorders	f	%
Cognitive Mental Function Medium	45	46,87
Cognitive Heavy Mental Function	51	53,13

Based on the table above, the distribution of elderly frequencies based on Cognitive Disorders is found to occur most in the elderly who experience severe mental cognitive aspect damage.

Table 5.  
Distribution of Respondent Frequencies by Physical Activity (n= 96)

Physical Activity	f	%
self-sufficient	73	76,04
depends	23	23,96

According to the table above, 23 elderly people have physical activity that relies on others.

Table 6.  
Frequency Distribution of Respondents based on Fall Risk Severity (n= 96)

Risk of Falling	f	%
Low Fall Risk	47	76,04
Moderate Fall Risk	33	
High Fall Risk	16	23,96

Based on the table above, the distribution of elderly frequencies based on Fall Risk Emergency was obtained as many as 47 elderly people had low Fall Risk Emergency.

Table 7.  
Results of bivariate analysis of the relationship between Cognitive Disorders and the risk of falling (n= 96)

Cognitif Disorders	low		High risk keep		tall		sum		P value
	f	%	f	%	f	%	f	%	
Moderate cognitive	32	71,1	8	17,8	5	11,1	45	100	0,05
Cognitive burden	15	29,4	25	49,0	11	25,6	51	100	

The results of the bivariate analysis showed that the relationship between Cognitive Disorders in the elderly and infectious diseases on the risk of falls in the elderly was closely related between Cognitive Disorders of the elderly and infectious diseases on the risk of falls in the elderly. The proportion of respondents with a higher risk of falling was higher in respondents with Cognitive Disorders 25.6% or 11 elderly. The results of the correlation test obtained a significance value, so there is a close relationship between Cognitive Disorders and the risk of falling.

## DISCUSSION

The results of the distribution of respondent frequencies based on age from the research results showed that the proportion of elderly age was more in the age group of 60-74 years. The age limit for the elderly is the elderly, the elderly aged 75-89 years, and the very old age equal to or more than 90 years old (Purnama & Sari, 2020). The result of the distribution of the frequency of respondents based on gender was 61.46% as many as 57 elderly women. The results of the distribution of the frequency of respondents based on education were 56.25% as many as 54 elderly people with elementary school education at the highest level (Zakiyyah et al., 2019). The results showed that respondents in the Krobokan Health Center area who had heavy mental functions were 51 (53.13%), respondents and respondents who had independent physical activity as many as 73 or as many as 76.04%, respondents and respondents who had a low risk of falling were 47 or as many as 48.95% of respondents. The results of the distribution of the frequency of elderly respondents based on the results of data collection

found that the highest risk of falling was found in the elderly with a low risk of falling, namely with 48.95% of respondents as many as 47 respondents.

To assess the physical activity of the respondents were bathing, eating, dressing, going to the restroom, moving and continental. Physical activity included in ADL (Activity Daily Living) is a daily routine work activity and a staple activity for self-care (Putra & Ulfah, 2019). ADL is one of the measuring tools to assess a person's functional capacity by asking about daily life activities, to find out that the elderly need help or other ways to carry out daily life activities independently. Produce useful information to find out the fragility of the elderly who need care. Self-care activities that clients must do every day to meet their daily needs and demands (Silalahi et al., 2021). A person who has a poor level of physical activity will affect the level of physical activity, the hope is that by doing daily physical activities on a regular basis can maintain optimal blood flow and deliver nutrients to the brain (Fazriana, 2020).

The assessment of Cognitive Disorders the researcher used the MMSE (mini mental state examination) measuring tool. This measuring tool is used to assess memory, language, visuophysiological, praxis, calculating attention, rereaction and abstraction. Filling out the questionnaire and what has been researched by many respondents have emotional and language disorders, respondents who have normal cognitive function and who have memory and language disorders (Nur Rohmah et al., 2023). Cognitive Disorders are an essential part of the quality of life of the elderly in all countries. It is very closely related to the ability to process information in daily life and helps for lifelong well-being (Ningrum et al., 2023). Symptoms of impaired memory function can be felt by the elderly, one of the memory or cognitive disorders in the elderly is dementia. It is estimated that around 5% of the elderly will develop dementia and it will double every year. The number of elderly people who experience Cognitive Disorders is increasingly vulnerable as they get older or older, related to women who experience more than men (Maulina & Ulfa, 2022). This result can occur because women are more at risk of developing Cognitive Disorders, but because of the high life expectancy of women, so that the number of elderly women with their high age will increase the risk of developing Cognitive Disorders disorders (Syifa Nur Ayuni et al., 2024).

It was found that the proportion of respondents' risk of falling was the most in the low category. A fall is an event that causes a person to suddenly lie down or sit on the floor or in a lower place with or without loss of consciousness or injury (Supriadi & Washudi, 2023). Factors that cause falls include gait disorders, weakness of the lower extremity muscles, joint stiffness, slippery and uneven floors, tripping over objects, and poor vision due to poor light (Prahasgita & Lestari, 2023). In the elderly, there are changes in the sensory, musculoskeletal and central nervous systems. In the musculoskeletal system, it is the main structural component that undergoes changes in the muscles, namely the muscles shrink progressively. And bones lose calcium progressively (Deli Tua, 2020). Changes that go hand in hand with the increase in age in the elderly which further cause the elderly to be at risk of injury (Harni, 2024).

Based on the results of the study, elderly respondents in the Krobokan Health Center area of Semarang City have Cognitive Disorders with a risk of falling that there is a close relationship. The results of the study have proven the research hypothesis that there is a relationship between Cognitive Disorders and the risk of falls in the elderly (Anwar, 2022). According to the Ministry of Health, the elderly who experience cognitive impairment are initially found to have symptoms of forgetfulness, continue with difficulty recognizing objects and finally not being able to use even simple things (Zakirullah et al., 2022). The elderly can experience visuospatial disturbances, which can cause the elderly to get lost easily in an environment that has a decline in physiological capacity, so that the elderly have a risk of injury such as falling while doing limited physical activities (Agustana et al., 2023). Important

role in balance in the elderly and attention is needed in circumstances that cause a decrease in balance and an increased risk of falling .

## **CONCLUSION**

Based on this study, it identified several characteristics of all elderly people who experience Cognitive Disorders, physical activity and the risk of falling. In the Krobokan Health Center area, Semarang City. From the results of the research that has been carried out, it can be concluded that the characteristics of the elderly are more in the age group of 60-74 years, the characteristics of the elderly are more in the gender group are women, the characteristics of the elderly are more in the education group is elementary school equivalent. So based on the results of the study, it can be concluded that the relationship between Cognitive Disorders and the risk of falls in the elderly (Hasan, 2020).

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