

Physical Activities with the Event of Dementia in the Elderly at Tresna Werdha Social Original Hutuo Beringin

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Abstract. *The aging process in the elderly is accompanied by a decrease in physical conditions that can inhibit the elderly in doing physical activity, as a result of which the elderly are at risk of developing dementia. The purpose of this study was to find out the relationship of physical activity with the incidence of dementia in the elderly at the Tresna Werdha Beringin Hutuo Social Home. Cross sectional study design, the population of all the elderly in Tresna Werdha Beringin Hutuo Social Home as many as 43 elderly. The sample numbered 43 elderly using the Total Sampling technique. The instruments used were a GPAQ questionnaire to measure physical activity and an MMSE questionnaire to measure the incidence of dementia and using chi-square statistical tests. The results obtained there is a relationship of physical activity with the incidence of dementia in the elderly in Tresna Werdha Beringin Hutuo Social Home with a value of p-value 0.006. Thus, it can socialize to the elderly to do physical activity and plan and implement a program of activities.*

Keywords: *Elderly, Physical Activity, Dementia*

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INTRODUCTION

Old age is not only characterized by physical decline. Elderly conditions can also affect mental conditions (Muhith & Siyoto, 2016). Mental changes experienced due to feelings of loss, especially a life partner or family or close friends (bereavement), frequent isolation, feelings of loneliness to forget or dementia. Dementia is a syndrome of progressive decline in intellectual abilities that causes cognitive and functional deterioration, resulting in impaired social function, work and daily activities (Ekasari et al., 2018). The aging process in the elderly is accompanied by a decrease in physical, psychological and social conditions that will interact with each other, one of which is a decrease in cognitive function or dementia related to physical activity because cognitive functions include attention, memory and intelligence. inhibits independence in carrying out daily activities (Ekasari et al., 2018).

Data from the World Health Organization (WHO) in 2017 about 47 million people worldwide suffer from dementia and almost 10 million new cases are found every year. This number is predicted to continue to increase to 115 million in 2050. According to the Alzheimer's Disease International (ADI) Report in 2016, the number of people with dementia in Indonesia was 1.2 million people and Indonesia was included in the ten countries with the highest dementia in the world and Southeast Asia. in 2015 (Martina, 2020). Based on interviews with Tresna Werdha Beringin Hutuo Social Institution officers and the results of observations using the Mini Mental State Examination questionnaire to measure cognitive changes in 5 elderly people, it was found that 5 elderly experienced mild cognitive impairment with scores between 18-23, in addition the 5 elderly had sedentary behavior, namely Relaxing behavior includes sitting in a chair after doing daily activities such as bathing and eating. In addition, the elderly also have sedentary behavior, namely lying down and watching TV.

From the data obtained from various sources above, it is very important to conduct research on the incidence of dementia, because it causes disturbances in daily activities. So researchers are interested in conducting research on "The Relationship of Physical Activity with the Incidence of Dementia in the Elderly at the Tresna Werdha Beringin Hutuo Social Home".

METHODS

This study used an observational study design with a cross sectional approach. The population in this study were all the elderly at the Tresna Werdha Beringin Hutuo Social Institution as many as 140 elderly who were selected by total sampling at the Tresna Werdha Beringin Hutuo Social Institution. How to collect data using a physical activity questionnaire, namely the Global Physical Activity Questionnaire (GPAQ) and a dementia questionnaire, namely the Mini Mental State Examination (MMSE).

RESULTS AND DISCUSSION

Table 1. Frequency distribution of respondent characteristics

Variable	Frequency	Percentage (%)
Age		
1. Elderly (60-74 years)	37	86
2. Early adulthood (75-90 years old)	6	14
Gender		
1. Male	13	30,2
2. Female	30	69,8
Last education		
1. Elementary School	17	39,5
Junior High School	17	39,5
Senior High School	9	20,9
Previous Job		
1. Construction workers	1	2,3
2. Bentor	2	4,7
3. Grass trimmer	1	2,3
4. Tailor	1	2,3
5. Farmer	2	4,7
6. Not working	36	83,8

Elderly Physical Activity		
1. Light	17	39,5
2. Medium	14	32,6
3. Weight	12	27,9
Elderly Dementia Incident		
1. Dementia	22	51,2
2. No dementia	21	48,8

Table 2. Physical Activity with Dementia Incidence in the Elderly at Tresna Werdha Beringin Hutuo Social Home

Variable		Dementia Incidence		Total	<i>p-Value</i>
		No Dementia	Dementia		
Physical Activity	Light	4	13	17	0.006
	Currently	7	7	14	
	Heavy	10	2	12	
Total		21	22	43	

Table 1 shows the characteristics of the respondents based on the elderly age in this study, the majority were 60-74 years as many as 37 respondents (86%) and only 6 respondents (14%) aged 75-90 years old at the Tresna Werdha Beringin Hutuo Social Institution. Researchers believe that many elderly people who live in Tresna Werdha Beringin Hutuo Social Institutions are aged 60-74 years because at that age many elderly do not live with their families and the length of time in the orphanage is approximately 5 years, compared to the elderly aged 75-90 years living in the orphanage. have been more than 10 years and other elderly who are the same age as the respondents aged 75-90 years have partly died. Characteristics of respondents based on gender, the majority were women, as many as 30 elderly (69.8%). The data can be concluded that the most elderly in Tresna Werdha Social Institution are women and the incidence of dementia is more experienced by women, this is due to the highest life expectancy of most women which can affect the decline in estrogen hormone production when women enter menopause so they are more at risk. have dementia. The last education in this study was the majority of elementary and junior high school education levels with 17 respondents (39.5%) and secondary education level, namely high school with 9 respondents (20.9%).

Respondents based on occupation, namely the majority were previously unemployed or housewives as many as 36 respondents (83.8%) and only a few elderly before living in the orphanage worked as construction workers, bendor, grass trimmer, tailor and farmer. Work greatly affects the condition of the elderly because every time the elderly work to do activities, the elderly enter the environmental situation where they are done, a comfortable place will bring the elderly motivated to do work happily and actively (Ekasari et al., 2018). the majority of the elderly did light physical activity as many as 17 respondents (39.5%), this elderly activity was just sitting in a chair while watching television and lying down in a day. Physical activity was being carried out by 14 respondents (32.6%) including morning walks around the orphanage and walking to a place with a duration of activity of 30 minutes to an hour which was carried out 3 to 7 days a week. There were also elderly in the orphanage who did strenuous activities as many as 12 respondents (27.9%) including gardening in the orphanage and lifting sacks which was carried out for 3 days a week. The elderly in the nursing home did not experience dementia as many as 21 respondents (48.8%), but many elderly people were unable to follow the researcher's instructions in the cognitive domains of language and

practice so they only scored six to seven. Elderly with dementia as many as 22 respondents (51.2%) with cognitive domains that cannot be followed by the elderly, namely the assessment of registration, attention and calculation, memory and language and practice which obtained a total MMSE score of 0-23.

Table 2, it was found that the majority of the elderly who did light physical activity experienced dementia as many as 13 respondents. Compared to the elderly who did moderate physical activity, the majority did not experience dementia with 7 respondents each and the elderly who did strenuous physical activity did not experience 10 respondents. The results of the chi-square test obtained $p\text{-value} = 0.006 < 0.05$. Thus, there is a relationship between physical activity and the incidence of dementia in the elderly at the Tresna Werdha Beringin Hutuo Social Home.

According to the researchers, most of the 13 elderly with light physical activity experienced severe dementia, because 10 respondents only sat or lay down in a day except for sleeping with a total physical activity of <600 MET minutes per week, which caused these respondents to experience severe dementia because these respondents did not get enough physical activity. the maximum score in each question section of the MMSE both orientation, registration, attention and calculation, remembering and language, as a result respondents obtained a score of 0-23. Meanwhile, 3 respondents carried out walking or cycling activities to go somewhere for at least 10 continuous minutes and doing activities that resulted in an increase in breathing and pulse rate for at least 10 minutes continuously, but the total physical activity was <600 MET minutes per week so that respondents still had severe dementia. caused by the lack of duration of respondents in physical activity, the MMSE scores of the three respondents also did not get the maximum score in each section and obtained a score of 0-23. Meanwhile, the elderly who did strenuous physical activity, mostly 10 respondents did not have dementia or were in the category of normal cognitive function, because these respondents did heavy physical activity, did moderate physical activity that caused an increase in breath and pulse, walked or cycled to a place. place, doing activities that result in an increase in breath and pulse for at least 10 continuous minutes with a duration of activity 3000 MET minutes per week for 7 days, this causes their cognitive function to be normal, but these 10 respondents began to experience slight changes, namely mostly in the considering the objects previously mentioned by the researcher only got a score of 2 and language only got a score of 6-7 and the total score obtained by this respondent was 24-26.

Elderly with light physical activity also found that there were 4 respondents who did not experience dementia, because these respondents did physical activity, but in a short duration, where the elderly did moderate physical activity which could cause an increase in breath and pulse and walk to go to a place. place, with a length of activity that is 10-30 minutes in 1-4 days. One of the elderly also has a habit of watching the news and borrowing newspapers from the nursing home staff, according to the researcher, this stimulates the thinking process of the elderly so that the elderly do not easily forget, but the elderly do not get a high MMSE score, which is a score of 24 because the language cognitive section only gets a score of 6. Meanwhile, the other three elderly according to the researcher because they are also related to the age of the elderly, namely 62-63 years and also the education level of the three elderly is junior and senior high school, it has been discussed previously that the elderly begin to experience dementia at the age of 60 years, therefore cognitive changes in the three respondents slowly happened. In addition, the level of education can be associated with intellectual abilities so as to reduce the incidence of dementia. The results of the study also found that the elderly with strenuous

physical activity did not experience dementia, this was because the more physical activity the elderly carried out continuously every day of the week could slow the onset of dementia or be less at risk of developing dementia. In addition, the elderly are also influenced by the respondent's age, education level and previous occupation which can affect cognitive function.

Memory decline is the impact of cognitive impairment, this change occurs due to a decrease in the function of the central nervous system (Festi, 2018). Cognitive disorders affect intelligence or intelligence in the elderly. The intelligence center is in the outer layer of the brain and in the elderly who are active this section is thicker than the elderly who are less active, just sitting around and not doing any activity, the layer becomes atrophic. In addition, this intelligence ability is not only determined by the number of neurons in the elderly, which decreases by about 150-200 grams, but because the network between these neurons can still be stimulated by environmental factors, so that elderly people who are active have good cognitive function (Santoso & Ismail, 2009). Cognitive ability in the elderly can be improved by physical activity. Physical activity can delay degenerative diseases associated with aging to prevent functional decline in the elderly (Sitanggang et al., 2021). The theory (Gemini, et al., 2021) also states that the elderly are recommended to do physical activity, regular physical activity can help the elderly to be healthier and fitter, physical activity can also maintain brain health and function while reducing the risk of brain disorders such as dementia. Elderly who lack physical activity can increase the risk of dementia. Physical activity that is done regularly and periodically can make cognitive function better. This is because physical activity can maintain optimal blood flow and deliver nutrients to the brain. The elderly who do not do physical activity regularly will reduce blood flow to the brain and will cause the brain to lack oxygen. Physical activity can also stimulate nerve growth which inhibits cognitive decline in the elderly. When doing physical activity too, the brain will be stimulated so that it can increase a protein in the brain called brain derived neurotrophic factor (BDNF). This protein plays a role in keeping nerve cells healthy. However, if BDNF levels are low, it will cause dementia (Pranata et al., 2021).

Elderly with light physical activity, but do not have dementia because they have a habit of doing physical activity continuously even though the activity duration is 30 minutes, this is in line with the theory (Ekasari et al., 2018) which states that physical activity occurs in various domains. or places, for example when traveling, during leisure or recreation, can cause acute responses and long-term effects due to regular and programmed activities that lead to adaptation as a result the elderly become accustomed to doing physical activities. The age of the three respondents is still classified as forgetfulness for impaired cognitive function because the elderly starting at the age of 60 years experience forgetfulness and as they get older it will increase from 39% to 85%. This condition causes the elderly to usually easily forget the names of objects and often describe functions or forms rather than mentioning their names. Research (Yudhanti, 2016) found that there was a relationship between physical activity and the incidence of dementia in the elderly with a significant value of $0.000 < 0.05$, the researchers stated that the elderly who had less physical activity were more at risk of developing dementia, while the elderly with good physical activity were less at risk of developing dementia. dementia, In line with research (Wahyuningrum, 2016) which states that there is a relationship between physical activity and dementia.

Supported by research (Anggraeni, 2016) it is known that there is a significant relationship between physical activity and dementia in the elderly (p -value $0.000 < 0.05$),

this is because the elderly who do physical activity in good categories do not experience dementia, compared to the elderly who do moderate physical activity. have moderate dementia. Research (Fatimah & Lubis, 2018) also states that elderly people with low physical activity cause dementia, while the majority of high physical activity carried out by the elderly do not experience dementia, the p-value is $0.015 < 0.05$ so there is a significant relationship between physical activity and the incidence of dementia.

It was also found in the study, that there were 2 respondents who had strenuous activities experienced dementia, because the two elderly could not count consecutive numbers and were only able to spell 1 word on the MMSE questionnaire in the attention and calculation section, the two elderly were not only able to remember 1 object. namely a pencil, and in the MMSE language section the elderly only got a score of 5. According to the researcher, the two respondents experienced dementia not because of physical activity, but was influenced by other factors, where the age of both respondents had reached the age of 70 years so they had dementia, education level also affect where the two elderly do not have habits that can train cognitive functions such as chatting with other elderly to reminisce about their youth or watching tv, the two elderly only do a lot of activities on their own without interacting with other people.

Meanwhile, the elderly with strenuous activities experience dementia which occurs in a small proportion of the elderly which can be influenced by other factors besides physical activity, because they begin to lose long and short-term memory, lose information obtained, cannot remember items or numbers, begin to experience language decline. The two elderly also do not train their memory, as the elderly use or train their memory, the synaptic function between neurons will be more and more formed so that their memory capacity increases. Both elderly are also 70 years old, where the older a person is, the naturally occurring apoptosis in neuronal cells will result in atrophy, which results in a decrease in cognitive function. The education level of the two respondents is also relatively low, people with high education will have better cognitive function, compared to people with low education, because the more complex the stimulus obtained during education, the more one's brain ability will develop in cognitive function (Ekasari et al., 2018).

The results of this study, supported by research (Situmorang, 2020) found that there was a relationship between age and education levels with the incidence of dementia. According to (Situmorang, 2020), the elderly are a group at risk for dementia, the older the elderly, the easier it is to experience changes in cognitive function. Meanwhile, education is related to intellectual stimulation and social involvement because it can increase neural synaptogenesis which can reduce the risk of dementia when a person enters old age.

According to researchers, the elderly are at risk of developing dementia due to the decline in memory abilities, due to the elderly not doing physical activity. Elderly with good physical activity can reduce the risk of dementia, on the other hand, elderly with light physical activity can easily experience dementia which begins with forgetfulness. Physical activity does not have to be strenuous exercise, you can also do physical activities such as walking for at least 10 minutes regularly every day of the week. Regular physical activity is what causes the elderly to not experience dementia because of the stimulation of the thinking center or memory in the brain that has thickened, compared to the elderly who lack physical activity. In addition, regular and periodic physical activity can nourish the elderly brain by maintaining blood flow so as to stimulate nerve growth

in the brain which can inhibit the incidence of dementia. However, physical activity cannot treat dementia, only inhibits or slows down the signs and symptoms of dementia, it can also be influenced by other factors such as habits or memory training, age and education. Therefore, the elderly are still recommended to do physical activity because it is related to the incidence of dementia which is often found in the elderly.

CONCLUSION

Based on the results and discussion of the research, it can be concluded that the majority of the characteristics of the elderly respondents at the Tresna Werdha Beringin Hutuo Social Institution are mostly 60-74 years old, female, have the last elementary and junior high school education and did not work before living in the orphanage. The majority of the elderly only do light physical activity and the majority of the elderly have mild and severe dementia with a score range of 0-23. There is a relationship between physical activity and the incidence of dementia in the elderly at the Tresna Werdha Beringin Hutuo Social Home. Therefore, to prevent the occurrence of dementia in the elderly, it is recommended that the elderly do physical activity continuously and increase the physical activity that has been done and invite other elderly people to be motivated to do physical activity.

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