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The Relationship Of Physical Activity With Cognitive Function In The Elderly In Ciamis Village

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ABSTRACT

Purpose: This study aims to find out about Ciamis Village. **Method:** This study uses correlational analytical methods with a cross sectional approach. Sample in this study totaled 99 respondents. Samples were taken using technique sampling quotas and data collection using Mini Mental State Examination (MMSE) questionnaires and the International Physical Activity Questionnaire Short Form (IPAQ-SF). Data analysis was performed with a chi-square test. The study was conducted in March-April 2022. **Results:** Based on the results of the study that out of 99 respondents there were 48 elderly (98.0%) with less activity experiencing cognitive decline, 1 elderly (2.0%) with less activity having normal cognitive function , there were 44 elderly (88.0%) with good physical activity having normal cognitive function, and 6 elderly (12.0%) with good physical activity experiencing a decrease in cognition ive function. From the results of the chi-square test, it shows that there is a relationship between physical activity and cognitive function of the elderly in Ciamis Village with a p value = 0.000 <value (α) 0.05. **Conclusion:** Based on the results of this study it was found that better physical activity performed by the elderly results in normal cognitive function or maintenance of cognitive function, conversely if less physical activity results in a decrease in cognitive function.

Key words: Physical Activity, Cognitive Function, Elderly

Introduction

The increasing elderly population has led to the need for special attention so that the elderly not only live long but can enjoy their old age happily and independently. The increase in the elderly results in an epidemiological transition, namely a shift in disease patterns from infections and nutritional disorders to degenerative diseases such as diabetes, hypertension, neoplasms, coronary heart disease and disorders due to decreased function that often occur in the elderly (Hutasuhut, Anggraini, & Angnesti, 2020). According to the *World Health Organization* (WHO) in 2020, the population aged >60 years increased to 1.4 billion. It is estimated that by 2050, the world's population aged >60 years will double to 2.1 billion. According to statistical data in 2020, in Indonesia there was an increase in the percentage of the population from 2010-2020 in the elderly aged >60 years, which was 7.59% to 9.78%. The most elderly people are found at the age of 60-64 years, that is, 10.3 million people. Meanwhile, the population aged >75 years is 5 million people (BPS, 2020).

An increase in the number of elderly people is expected to be followed by an increase in life expectancy. In Indonesia, life expectancy (UHH) continues to increase, which marks the success of development from various fields, especially in the health sector, namely from 71.06 in 2010 to 71.2 years or an increase of around 0.19% in 2018 (BPS , 2020). Based on the survey results of the Central Statistics Agency (BPS) of West Java, the life expectancy from 2010 to 2019 has increased from 71.29 to 72.85 (BPS West Java, 2020). Based on data from the Ciamis Regency Health Office, the highest number of elderly people aged >60 years in 2020 was found at the UPTD Ciamis Health Center from 37 health centers located in Ciamis Regency. The number of elderly people in UPTD Cis is 9,124 people, consisting of 3,712 elderly men and 5,412 elderly people, while data on elderly 5 is the most aged >60 years. Based on the service coverage of the Ciamis Health Center in 2020, the first is Ciamis Village with a total of 2,364 elderly people, the second is Benteng Village 1,550, the third Linggasari Village is 1,510, the fourth is Cigembor Village 1,280 , and the fifth is Maleber District with 960 Elderly.

The elderly experience psychological changes that include changes in cognitive or affective, psychomotor and personality functions. The conquest of cognitive function in the elderly is an undeniable natural phenomenon (Ratnawati, 2018). Cognitive function can be influenced by a variety of factors, including age, gender, level of education , genetic factors and disease history. As well as environmental factors including relationships or social limitations (*social engagement*) and activities , both good activities and cognitive activities (Hutasuhut et al., 2020). Of these factors, the problems that are often faced by the elderly are mental changes (cognitive disorders) including impaired orientation, time, space, place, and not easily accept new things or ideas (Ramli & Fadhillah, 2020). Based on Dalilah's research, (2019) in Rapa Laok Village, Omben District, Sampang Regency, the results of the examination using the MMSE (*Mini Mental State Examination*) questionnaire with 30 respondents, there were 19 elderly (63.3%) with poor cognitive function and 11 elderly (36.7%) good category. This can be influenced by age factors, considering that the samples used were 13 elderly aged 63-65 years and 2 elderly aged 72-74 years.

Cognitive function is a human mental process that includes attention, perception, thinking processes, knowledge, memory where this cognitive function is one of the brain functions that has an area of 75% in the brain cortex (Saladin, 2007 in (Lestari, Azizah, & Khusniyati, 2018). The cognitive domain consists of attention, memory, language, visuospatial ability, and executive functions (planning, organizing, and execution functions) (Pramadita, Wati, & Muhartomo, 2019). The impact of cognitive function impairment can be *forgetfulness*, mild cognitive impairment (MCI), and dementia is the most severe cognitive impairment (Pramadita et al., 2019). As well as increasing the risk of falling in the elderly

because impaired cognitive function can lead to poor judgment and decision making, impaired reactions, attention and speed of information processing in the brain (Kusumawaty, et al, 2018). From this impact, it causes an increase in the dependence of the elderly on people around them because the elderly experience limitations in carrying out activities so as to affect their quality of life (Manungkalit, Sari, & N, 2020).

Physical activity is the movement of limbs that causes energy expenditure to maintain physical and mental health, as well as maintain the quality of life to stay healthy and fit throughout the day (Purnama & Suahda, 2019). Some elderly people reduce the amount of physical activity because they think physical activity is not in accordance with their lifestyle, while the elderly are aware of the benefits, but some elderly people experience a decline in health so that they can no longer do physical activity (Noviati et al., 2021).

Programs that can significantly improve cognitive performance in the elderly are short-term physical activity, such as exercise, *Range Of Motion* (ROM) and doing regular and regular physical activity such as walking, elderly gymnastics (brain gymnastics) or doing household chores can improve cognitive function. Because physical activity can maintain optimal blood flow and provide nutrients to the brain. If the elderly do not exercise regularly, blood flow to the brain decreases and the brain becomes deprived of oxygen (Wicaksono & Handoko, 2020). The impact of lack of physical activity can increase the risk that chronic diseases can cause death globally (Mulyadi, Fitriana, & Rohaedi, 2020). And can increase the risk of coronary heart disease, diabetes, hypertension, cancer, obesity, diabetes mellitus, anxiety, depression, and dementia (Wahyuni, Susilowati, & Imamah, 2020). Lack of physical activity can also lead to falls, since with a lack of movement the body's metabolism is disturbed (Kusumawaty et al., 2018).

Based on a preliminary study conducted on November 13, 2021 at the UPTD Ciamis Health Center, the number of elderly people has increased high in Ciamis village, namely 2,364 elderly consisting of 1,172 elderly men and 1,192 elderly people. Based on the results of a questionnaire to measure cognitive function, namely *the Mini Mental State Examination* (MMSE) and the results of an interview on November 27, 2021 in Ciamis village, out of 10 elderly people, there were 3 elderly with mild cognitive function impairments because they got a score of <23-18, and 7 elderly people had good cognitive function with a score of >24-30. It is mentioned that 3 elderly people with mild cognitive impairment sometimes do light physical activity such as reading a book while sitting, lying down or sitting while watching tv, sitting in front of the house while sunbathing and rarely doing moderate physical activity. The 7 elderly who have good cognitive function in addition to doing light physical activity also often do moderate physical activities such as gardening, doing household chores, namely washing dishes, cooking, ironing, sweeping and mopping the floor. So based on the above, the author feels interested in conducting a study with the title "The Relationship of Physical Activity with Cognitive Function in Ciamis Village".

Methods

The method in this study is correlational analysis with *a cross sectional* approach. The variables used in this study are *independent* variables, namely physical activity and *dependent* variables, namely cognitive function. The population in this study was elderly women aged >60 years who lived in Ciamis Village as many as 1,192 people. Sampling used a *quota sampling* technique with the slovin formula which resulted in a total sample of 99 respondents.

The instruments in this study are the *International Physical Activity Questionnaire Short Form* (IPAQ-SF) questionnaire as a measuring tool for taking physical activity data carried out by the elderly over the past week and the Mini Mental State questionnaire

Examination (MMSE) as a measure of the level of cognitive function, These two questionnaires have modified by researchers. The IPAQ-SF questionnaire contains 8 questions and has been valid with a calculated range of r values of 0.445-0.924. The scale used is an ordinal scale with less categorical and good categories. The MMSE questionnaire contains 19 questions and has been valid with a calculated range of r values of 0.491-0.878 on a scale used by normal categorical and decreases. Data analysis using *chi-square* test. The study was conducted in March-April 2022.

Results

Table 1. Frequency distribution of characteristics of elderly respondents

	Frequency	Presentation
Age		
60-74	90	90.9
75-90	9	9.1
Education		
SD	68	68.7
SMP	13	13.1
SMA	14	14.1
Bachelor	4	4.0
Work		
IRT	87	87.9
Merchant	8	8.1
Pensioner	4	4.0

Based on table 1. data were obtained from the 99 most respondents aged 60-74 years with a total of 90 elderly (90.9%). For education, the last most people attended primary school with 68 elderly respondents (68.7%). Regarding the work of female elderly respondents in Ciamis Village, most of them became IRT (housewives) with a total of 87 elderly people (87.9%).

Table 2. Frequency of physical activity of the elderly

No	Physical Activity	Frequency	Presentation
1	Less	49	49.5%
2	Good	50	50.5%
	Entire	99	100.0

Based on table 2. data were obtained that the physical activity of respondents who were lacking was 49 elderly (49.5%) and those whose physical activity was good amounted to 50 elderly (50.5%).

Table 3 Overview of the cognitive level of the elderly

No	Cognitive function	Frequency	Presentation
1	Usual	45	45.5
2	Reject	54	54.5
	Entire	99	100.0

In table 3. data was obtained that the cognitive function of respondents who experienced a decline was 54 elderly (54.5%) and normal respondents amounted to 45 elderly (45.5 %).

Table 4 overview of physical activity with cognitive function

Physical Activity	Cognitive function		Entire	p-value
	Usual	Reject		
Less	1	48	49	0,000
	2.0%	98.0%	100.0%	
Good	44	6	50	
	88.0%	12.0%	100.0%	
Entire	45	54	99	
	45.5%	54.5%	100.0%	

Based on the results of the *chi-square* test between physical activity and cognitive function , it showed that as many as 48 elderly (98.0%) with less physical activity experienced a decrease in cognitive function and 44 elderly (88.0%) with good physical activity had normal cognitive function .

In accordance with the purpose of this study, which is to analyze the relationship between physical activity and cognitive function in elderly in Ciamis Village, this study shows that the results of *chi-square statistical* testing are p value = 0.000 with an error rate (α) of 0.05 or in other words a p value of <0.05, so Ho rejected which means that there is a relationship between physical activity and cognitive function in the elderly in Ciamis Village.

This research is in line with Hutasuhut et al., (2020), namely the relationship between physical activity and cognitive function in the elderly. From the results of the study, it was found that there was a significant relationship between physical activity and cognitive function in the elderly in the work area of the Kedaton Bandar Lampung Health Center in 2018, where respondents with low physical activity had a 4 times greater chance of experiencing impaired cognitive function.

This study is also similar to that studied by Vanny, Polan, Asrifuddin, & Kalesaran, (2018) namely there were 11 respondents who had good physical activity but had a total MMSE score of <24 so that their cognitive function was impaired because most respondents were not able to answer well in orientation , attention and calculation of DNA, language and part remembering. come back. Any body movement that requires energy expenditure such as gardening, walking, doing household chores, cycling, dancing and also gymnastics can improve memory work, executive function, attention, and short/long term memory.

In this study, there was 1 respondent who had less physical activity but normal cognitive function, and there were 6 respondents who had good physical activity but less cognitive function. One of the factors that can affect cognitive function is physical activity

where the elderly aged >60 years who lack physical activity tend to cause a decrease in cognitive function, so the role of those closest to their family and neighbors is needed to help daily activities, foster trusting relationships, and be open in prevention efforts. The risk of impaired cognitive function creates a sense of security for parents. As in Fazriana, (2020) which mentions the factors that influence the decline in cognitive abilities are age, gender, genetics, disease history, physical activity, social interaction, general health, education level, and environment.

Meanwhile, according to Sauliyusta & Rekawati, (2016) if all levels of physical intensity are combined into one hour measure of MET/day, there is no visible relationship between physical activity and cognitive function of the elderly and household activities carried out by the elderly only slightly affect cognitive function.

Researchers assume that if you want to get significant results, then engage in regular and consistent physical activity. As in the journal Wicaksono & Handoko, (2020) physical activity that can significantly improve cognitive performance in the elderly is a routine short-term activity that is also routinely carried out such as walking, elderly gymnastics / brain gymnastics, or doing household chores. Because physical activity can maintain optimal blood flow and provide nutrients to the brain. If the elderly do not exercise regularly, blood flow to the brain decreases and the brain becomes deprived of oxygen.

According to Sauliyusta & Rekawati, (2016) physical activity has four main dimensions, namely type, frequency, duration, and physical intensity. We recommend that physical activity in the elderly be carried out three times a week with a duration of 30 minutes, which will have a good impact on the improvement of cognitive function by 20% on executive control processes such as planning, scheduling, memory, impaired control, and coordination of work tasks.

Based on the results of this study, it was found that the better the physical activity carried out by the elderly produces normal cognitive function or maintained cognitive function, on the contrary, if physical activity is less then it results in a decrease in cognitive function.

Conclusions

The conclusions of the study are: The physical activity of elderly female respondents mostly had good physical activity, but only a difference of 1 person with those who had less physical activity. The cognitive function of elderly female mostly experienced a decline in cognitive function. There was a significant association between physical and cognitive activity in elderly women in Ciamis Village with p value results = 0.000 <α= 0.05 (5%).

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