

## **RELATIONSHIP OF PHYSICAL ACTIVITIES WITH COGNITIVE FUNCTION DISORDERS IN ELDERLY IN TRESNA WERDHA SOCIAL BEACH BUDHI BEKASI DHARMA 2017**

**Akhmad Muttaqin<sup>1\*</sup>; Sri Siswani<sup>2</sup>; Midyawati Ahmad<sup>3</sup>**

<sup>1</sup>University of Respati Indonesia

**\*corresponding author: [muttaqin.akhmad@gmail.com](mailto:muttaqin.akhmad@gmail.com)**

### **Abstract**

The 2015 National Socio-Economic Survey (BPS) results show that Indonesia is among the four largest countries with the highest population age in the world, reaching 21.68 million or 8.43 percent of the total population. One health problem that often arises in the elderly population is a decline in cognitive function. The decline in cognitive function has an impact on decreasing daily social activities in the elderly which is a problem in public health, and has an impact on increasing family, community and government funding. This study aims to determine the relationship of physical activity to cognitive impairment in the elderly at the Social Institution Tresna Werdha Budhi Dharma Bekasi in 2017. The study design used was cross sectional in the primary data consisting of 87 respondents. The study was conducted in July 2017 using a questionnaire filled in by the respondents themselves, univariate analysis and bivariate analysis using chi-square. The results showed that 56.3% of the elderly had cognitive impairment. The statistical test results showed that there was a relationship between physical activity and impaired cognitive function in the elderly ( $p\text{-value}=0,000$ ). So it is expected that the elderly can be more independent in carrying out daily activities in accordance with the ability to minimize the incidence of injuries that occur.

**Keywords: Cognitive Function, Physical Activity, Elderly**

### **1. INTRODUCTION**

The Susenas (BPS) results show that Indonesia is one of the four largest countries with the highest population in the world, reaching 21.68 million or 8.43 percent of the total population. The number of elderly people in the world is estimated to reach 25.07 million by 2020 based on UN World Populations Prospects: the 2010 Revisions. The Central Statistics Agency (2015) projects that the number of elderly people (60+) is expected to increase to 27.1 million by 2020, to 33.7 million in 2025 and 48.2 million in 2035. But this increase in Life Expectancy (UHH) can lead to an epidemiological transition in the health sector due to the increasing number of morbidity due to degenerative diseases. This change in demographic structure is caused by an increase in the elderly population. Along with the increasing number of elderly people in Indonesia, the problem of disease due to the aging process has also increased. One health problem that often arises in the elderly population is a decline in cognitive function. This cognitive function disorder often has an impact on social life, psychology and physical activity of the elderly. Psychologically, this cognitive disorder can make the elderly become frustrated to depression, not infrequently families or caregivers who accompany the elderly also experience depression. It is estimated that one third of adults will experience gradual decline in cognitive function as they age (Ramadian D, Maja, et al., 2012). In Indonesia, the number of people with dementia (ODD) is expected to increase from 960,000 in 2013, to 1,890,000 in 2030 and 3,980,000 ODD in 2050 (World Report Alzheimer's, 2012). Dementia in the elderly has many risk factors, such as age, education level, blood pressure, nutritional intake, genetics, gender and lack of physical activity. Activities to fill leisure time for the elderly can reduce the risk of dementia (RAN Dementia, 2015). Efforts to prevent and control

people with non-dementia (HKND) and dementia require collaboration from the government, the private sector and development partners and other stakeholders. To collaborate in a coordinated, integrated and harmonious manner, it is necessary to have another National Strategy for the Prevention of Alzheimer's and Dementia: Towards healthy and productive Seniors. (RAN Dementia, 2015).

Physical activity has a beneficial influence on cognitive function in the elderly. It is also one of the prevention efforts against impaired cognitive function and dementia. Elderly people who engage in activities involving cognitive function can significantly reduce their risk of suffering from dementia. Physical activity includes endurance and walking exercises, can improve cognitive function in older adults, including those who have been diagnosed with mild cognitive impairment or Mild Cognitive Impairment (MCI) according to four new studies conducted randomly by the Alzheimer's Association International Conference (AAIC) on in 2012. Based on a preliminary study on the Tresna Werdha Budhi Dharma Social Institution in Bekasi, there are currently 112 elderly people. Preliminary studies were carried out by questionnaire technique on June 20, 2017 using the Clock Drawing Test (CDT) format. The researcher sampled 7 elderly people and found that 2 people experienced cognitive impairment with physical activity in the category of severe dependence, 2 people experienced cognitive impairment with moderate activity category of physical activity and 3 people did not experience cognitive impairment with independent physical activity categories. Based on the description, the author feels the need to conduct a study on the relationship of physical activity to cognitive impairment in the elderly at the Social Institution of Tresna Werdha Budhi Dharma Bekasi. It is hoped that the results of this study will be useful for the Ministry of Social Affairs, the Health Office and related agencies in the improvement, planning and implementation of the elderly health program

## 2. METHODS

This study uses a quantitative approach with a cross sectional study design. Research on the Social Institution of Tresna Werdha Budhi Dharma Bekasi. The population in this study were all elderly aged  $\geq 60$  years in the Social Institution of Tresna Werdha Budhi Dharma Bekasi as many as 112 respondents. The research instrument used was a questionnaire consisting of the Clock Drawing Test (CDT) and a list of questions about physical activity carried out by the elderly at the Tresna Werdha Budhi Dharma Social Institution in Bekasi. Data analysis used in this study used univariate analysis and bivariate analysis using Chi Square test

## 3. RESULTS AND DISCUSSION

Table 1 Frequency Distribution of Respondents according to Cognitive Disorders PSTW Budhi Dharma Bekasi in 2017

Cognitive Disorders	n	%
Interrupted	49	56,3
Normal	38	43,7
Total	87	100

Of all the elderly who were respondents in this study, 49 people had impaired cognitive function (56.3%) and 38 people had normal cognitive function (43.7%).

Table 2 Frequency Distribution of Respondents according to Physical Activity at PSTW Budhi Dharma Bekasi in 2017

Physical Activity	n	%
Dependency	49	56,3
independent	38	43,7
Total	87	100

Elderly physical activity is categorized into 2 namely physical activity dependence and independent physical activity. Respondents who had dependency physical activity were 49 people (56.3%), while those included in independent physical activity were 38 people (43.7%).

Table 3 Relationship between Physical Activity and Cognitive Disorders PSTW Budhi Dharma Bekasi in 2017

Variabel		Cognitive Disorders				<i>P-value</i>
		Interrupted		Normal		
		n	%	n	%	
Physical Activity	Dependency	49	100	0	0	0,000
	Independent	0	0	38	100	

From the table above, the results of statistical tests between physical activity and cognitive function disorders found that most elderly people with dependency activities had cognitive impairment as many as 49 (100%). Whereas in the elderly who have independent activities there is no impaired cognitive function. The results of the relationship test found that there was a significant relationship between physical activity (p-value = 0,000) and impaired cognitive function in the elderly.

### Cognitive Function

The results of this study indicate that the average elderly who experience cognitive impairment, as many as 49 people (56.3%) of 87 respondents. This is supported by the results of overseas research showing that elderly people who live in homes tend to be more at risk of developing cognitive dysfunction compared to the elderly who live in their respective families (Wilson, 2002). Alvarado et al. (2004) in Mexico City obtained from 132 elderly people living in homes, 102 people (65.8%) had lower MMSE scores compared to 30 people (24.0%) among 132 elderly people who lived in families. Alvarado et al. (2004) stated that after 6 months, the condition of the elderly living in homes worsened, especially among women with a mortality rate of 33%. The Guerrero et al. (2007) in the Philippines also showed that the elderly in the community had an average MMSE score higher than those who lived in homes. In this study using the Clock Drawing Test (CDT) in assessing the cognitive status of the elderly. CDT is an instrument to assess cognitive function more easily and quickly to be done in primary health care and CDT is not influenced by age, education level, culture, compared to using Mini Mental State Examination (MMSE) which requires longer time both in the implementation process and when interpretation of examination results. It can be concluded that most of the elderly who are at PSTW Budhi Dharma Bekasi experience cognitive function disorders (56.3) this is because there are other factors that affect the cognitive level of the elderly, such as health status, social interactions, cognitive

activities such as playing chess, read newspapers / magazines / books, write, fill in TTS, participate in discussion groups, and play music like angklung.

### **Physical Activity**

The results of this study indicate that the average elderly has independent physical activity, as many as 38 people (43.7%) from 87 respondents. Physical activity can increase vascularity in the brain, increase dopamine levels, and molecular changes in neutropic factors that are useful as a neuroprotective function. Physical activity will provide the brain with the necessary supply of nutrients. Research shows that physical activities such as walking, jogging affect the frontal lobes of the brain, areas that play a role in mental concentration, planning, and decision making. Mild physical activity such as walking can help the body prevent a decline in the brain's working power in the elderly. The longer and often the activities of walking are carried out, the sharpness of the mind will also improve.

Physical activity every day for 30 minutes can stimulate the brain. Someone who gets physical training shows motor fitness, academic performance, and a better attitude than someone who does not get physical training. Research on the brain also supports the importance of quality physical activity. Mental focus and one's concentration level will increase significantly after structured physical activity. Research shows that one's brain is able to form new neurons, the process is called neurogenesis. The new neurons survive and integrate themselves into the brain's structure. To survive and become the brain's active structure, new neurons need support not only from nerve support cells (glia cells) and nutrients through the blood, but more importantly is support from relationships with other nerves (synapses). Without this connection the nerves will die.

The most active area to experience neurogenesis is the hippocampus, an area located in the inner brain, which is involved in the process of learning and memory. From the observations of the researchers during the interview, it was found that some elderly people were still active in the existing activities, such as gymnastics, making crafts, playing angklung and so on. In contrast to the research conducted by Wreksoatmodjo (2013), it was shown that the average elderly living in nursing homes had poor physical activity. According to Yamada (2009) the elderly residents of nursing homes have less physical activity compared to the elderly who live with their families. Lack of physical activity increases the risk of decreased cognitive function. It can be concluded that there is a significant difference between the elderly who have independent physical activity and physical activity dependence, because in PSTW Budhi Dharma Bekasi there is a fixed schedule for carrying out the activities that have been determined by the parties or nursing staff. Elderly people who have activities are less likely to be caused by the elderly being obedient in carrying out daily activities, elderly disinterest in the activities that have been scheduled at the institution (such as: gymnastics, handicrafts etc.) and the age factor of respondents who are already classified as elderly so that the respondent's ability to move becomes more limited.

This is in accordance with the study of Gruccione (2005) which states that getting older or older is always associated with a decrease in the level of physical activity. This is caused by 3 things, namely: (1) changes in the structure and connective tissue (collagen and elastin) in the joints, (2) the type and ability of activity in the elderly has a very significant effect on the structure and function of tissue in the joints, (3) pathology can affect joint connective tissue, causing functional limitation or limited function and disability. Other factors that can affect the decline in the level of physical activity of the elderly are genetic, previous living habits, trauma or accidents, and others. The Relationship Between Physical Activity and Impaired Cognitive Function The results of this study indicate that there is a relationship between physical activity and impaired

cognitive function in the elderly with a p-value of 0,000. This study was supported by a study conducted by Williamson et al. (2008) in the United States which showed that cognitive value increased which was associated with increased physical function. Another research that supports this research is Auyeung (2008) who states that a person who lacks physical activity and muscle strength will usually experience cognitive impairment. The study conducted by Busse (2009) shows that physical activity can improve executive functions, attention, speed of thinking, work motivation and long / short term memory.

Another study was conducted by Clouston (2013) which states that there is a relationship between activity levels physical with cognitive function in the elderly. In addition, according to Muzamil, Afriwardi, and Martini (2014), high levels of physical activity and routine have a relationship with the high score of cognitive function. However, elderly people who have low or moderate levels of activity are associated with decreased cognitive function, especially memory and language function (Makizako 2014). The activity of physical activity can be increased without requiring a lot of additional energy or facilities, but requires consistent scheduling and attention from the management of staff by knowing the types of physical activity that the elderly can do according to their ability to minimize the occurrence of injuries or unwanted things occurs in the elderly. Brain vitalization exercise programs can be re-implemented with a duration of 2-3 times a week which can improve the health status of the elderly and the quality of life of the elderly. The facilities in the form of television are generally available in institutions that need to be improved, stimulating interest and discussing what is being watched. Likewise with the provision of reading facilities and games that stimulate memory and concentration.

#### **4. CONCLUSION**

Physical activity can be useful in reducing the risk of decreasing cognitive function, but further measurable further research is needed regarding the type and frequency of physical activity so that it can be applied in elderly activities.

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