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Activities of Brain Gymnastics Against Enhancement of Cognitive Function in the Elderly

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Background: *The old age is a period that cannot be avoided by anyone, especially for those who are endowed with long life, which can be done by humans is only to prevent the aging process so that it is not too fast, because in essence the aging process occurs a setback. or decrease. One of them is a decline in cognitive function, cognitive decline in the elderly can include various aspects, namely orientation, registration, attention, and calculations, memory and language. The problem of this research is the decline in cognitive function in the elderly can cause problems including long memory and information processing, in the long memory of the elderly it will be difficult to reveal new information or stories or events that are not so interesting.* ***Methods****: The design in this study uses Quasi Experimental with Non Randomized Control Group Pre-Test-Post Test Design approach. This type of research is the procedure of giving pre test before treatment and post test after treatment using a questionnaire instrument. The population in this study were 30 elderly people, while the study sample was 28 people.* ***Result****: the results of research conducted on July 19, 2019 to July 30, 2019, obtained data analysis with statistical tests using the Paired T-Test. The significance value or p value in the brain exercise function is 0,000 and the cognitive function is 0.002 with a significance level of 5% or α = 0.05. It is known that the correlation between before brain exercise and after brain exercise is 0.917.* ***Conclusion****: Because the significance value or p value α α = 0.05, H0 is rejected and H1 is accepted, which means there is an effectiveness of brain exercise for improving cognitive function in the elderly in Tegalan Village, Kandat District, Kediri Regency.*

I. Introduction

Elderly is someone with advanced age who undergoes biological, physical, psychological and social changes. These changes will affect all aspects of life, including health. Therefore, health in the elderly needs special attention while providing motivation so that the elderly can live productively according to their abilities (Darmajo, 2009).

The number of elderly population in Indonesia in 2006 was approximately 19 million, with a life expectancy of 66.2 years. In 2010 it is estimated at 23.9 million (9.77%), with a life expectancy of 67.4 years and in 2020 it is estimated at 28.8 million (11.34%), with a life expectancy of 71.1 years. Based on this number, the elderly population in Indonesia is the fourth largest after China, India and Japan (Central Bureau of Statistics, 2010).

In each person, the physiological functions of the organs of the body are very different, both in terms of peak achievement and decline, to maintain cognitive function in the elderly, the efforts that can be done are by using the brain continuously and resting by sleeping, activities such as reading, listening to the news and stories through the media should be made a habit, it aims so that the brain does not rest continuously (Ministry of Health of the Republic of Indonesia, 2008).

Cognitive decline is not a normal part of the aging process. Decreased cognitive abilities are often found, and are sometimes preceded by a decrease in emotional control, social behavior, and even motivation (WHO, 2012). The decline in cognitive function in the elderly can include various aspects, namely orientation, registration, attention and calculation, memory and language. . This decrease can lead to problems, including long memory and information processing, in long memory the elderly will have difficulty in expressing new information or stories or events that do not really attract their attention (Dalton, 2008).

According to brain exercise experts from the Institute at Educational Kinesiology, the United States Paul E. Denisson Ph.,D., although simple, Brain Gymnastics can improve the cognitive abilities of the elderly. Movements in Brain Gym are used by students at Educational Kinesiology, USA. (Franc, 2012). One way to improve cognitive function in the elderly is Brain Gym. Brain Gymnastics will not only facilitate the flow of blood and oxygen to the brain, but also stimulate both hemispheres of the brain to work (Tammase, 2009). Brain Gymnastics is an activity that aims to maintain brain health with simple movements (Hyatt, 2007).

The way to improve cognitive function in the elderly is group activity therapy, with Reminiscene therapy it provides benefits for maintaining individual identity and can also improve cognitive function, because the elderly will use their past to defend their opinions from criticism (Johnson 2005). Another way that can be used to improve cognitive function is brain gym or brain exercise or exercise. Brain exercise will not only facilitate the flow of blood and oxygen to the brain, but also stimulate both hemispheres of the brain to work (Tammase, 2009).

Brain exercise is an alternative in maintaining intact cognitive function in the elderly in the village of Tegalan, Kandat District, Kediri Regency. Based on the above observations, the researchers are interested in conducting research on the elderly in the village of Tegalan, Kandat sub-district, Kediri district, regarding brain exercise to improve cognitive function in the elderly.

II. METHODS

In this study using the type of experimental research. The design in this study uses a quasi-experimental approach with a Non-Randomized Control Group PreTest – Post Test Design. This type of research is the procedure of giving pre-test before treatment and post-test after treatment using a questionnaire instrument. The population in this study were the elderly, amounting to 30 people, while the research sample was 28 people. The sample is a part of the population to be studied and is considered to be able to describe the population (Suhita, 2017). Respondents were taken using simple random sampling technique.

III. RESULT

Table 1. Characteristics of respondents

	Characteristic	ΣN	Σ%
1	**Health status**		
	Very well	5	18
	Good	18	64
	Enough	3	11
	Less	2	7
2	**Gender**		
	Man	4	14

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	girl	24	86
3	**Old**		
	50-60	4	14
	61-70	11	39
	71-80	13	47
4	**Education**		
	Senior High School	8	29
	Bachelor	20	71
5	**Cognitive**	**Brain Gymnastics**	
		Pre	**Post**
	Good	16	25
	Enough	5	3
	Less	7	0

Table 2. The results of the analysis of the Paired Sample T-Test of giving brain exercise to the elderly in Tegalan Village, Kandat District, Kediri Regency.

		Mean	T	p-value	Correlation
Giving Brain Gym	Cognitive Function Before	16.71	-11.516	0,000	0,917
	Cognitive Function After	24.82		0,000	

Based on the table above, the results of research conducted from july 19, 2019 to july 30, 2019, obtained data analysis with statistical tests using the paired t-test, namely the average value of cognitive function levels before giving brain exercise was a scale of 16.71 then increased to 24.82. the significance value or p value on brain exercise function is 0.000 and cognitive function is 0.002 with a significance level of 5% or = 0.05. it is known that the correlation value between before brain exercise and after brain exercise is 0.917. because the significance value or p value = 0.05, h0 is rejected and h1 is accepted, which means that there is an effectiveness of brain exercise on increasing cognitive function in the elderly in tegalan village, kediri regency.

IV. DISCUSSION

Identifying Cognitive Function Before Being Given Brain Exercise To The Elderly In Tegalan Village

The findings of researchers in the elderly in tegalan village before the brain exercise was carried out were still at the level of the sufficient category. these results were obtained based on various categories, namely based on health status, gender, age and last education. this shows that at an advanced age will lead to a risk of cognitive decline. it is hoped that later with the brain exercise treatment it can help improve cognitive function in the elderly.

this finding is also supported by the results of the analysis which revealed that age is one of the factors that have a risk of dementia (japardi, 2003). this is in line with the results of previous studies

that the number of elderly people who experience dementia is greater at the age of 60-75 years, namely (75%) (marhamah 2009). based on research by roan (2009) also stated that dementia can also occur at any age, but more in the elderly for the age range of 65-74 years (50%). the results of watson's (2003) research also state that the prevalence of dementia in the elderly aged 60 years and over will double for every 5 years of age increase identify cognitive function after being given brain exercise to the elderly in the village of Tegalan

The initial study of the elderly was given a pre-test and the results were that the cognitive function level of the elderly was still in the sufficient category and there were some elderly people who were still at a poor level. Then the researchers gave regular brain exercise for 12 days, obtained pre-test data from the research respondents totaling 28 elderly people who were previously known to have low cognitive function as many as 7 elderly (25%) then after being given brain exercise who had less cognitive function to 0% or nothing at all. It can be concluded that the cognitive function of the elderly in Tegalan Village has increased after being given brain exercise. So there is the effectiveness of brain exercise on cognitive function in the elderly.

The risk of dementia can be prevented by doing brain exercise regularly. This is in line with the opinion about the theory of brain exercise in Paul and Gail E. Dennison's brain gym book which states that brain exercise can stimulate all parts of the brain to work so that it can improve cognitive function. Brain exercise can also provide benefits, namely reduced emotional stress, clearer thoughts, human relationships and a more relaxed and happy learning/work atmosphere, increased language and memory skills, people become more excited, more creative and efficient, people feel healthier because stress decreases, learning and work performance increases (Denisson 2009). The principle of brain exercise is to activate the brain into three functions, namely, lateral dimension (left-right brain), focusing dimension (front-back brain), concentration dimension (upper-down brain).), each dimension has a specific task, so the gymnastic movements that must be performed may vary (Denisson 2009).

Light movements with games through the hands and feet can provide stimulation or a stimulus to the brain. The movement that produces the stimulus is a movement that can improve cognitive abilities (alertness, concentration, speed, perception, learning, memory, problem solving and creativity). In addition, activities related to spirituality should be intensified in order to give peace to the elderly (Ministry of Health of the Republic of Indonesia, 2008). There are several ways to overcome the occurrence of dementia in the elderly, both pharmacologically and non-pharmacologically. In this study using a non-pharmacological method, namely brain exercise therapy given for 15 minutes four times for 2 weeks, regularly can reduce the occurrence of cognitive decline (Denisson 2009).

Analyzing the effect of brain exercise on changes in cognitive scores in the elderly in Tegalan Village.

Based on the results of research conducted from July 19, 2019 to July 30, 2019, data analysis was obtained with statistical tests using the Paired T-Test, namely the average value of the level of cognitive function before giving brain exercise was a scale of 16.71 then increased to 24.82. The significance value or p value on brain exercise function is 0.000 and cognitive function is 0.002 with a significance level of 5% or = 0.05. It is known that the correlation value between before brain exercise and after brain exercise is 0.917. Because the significance value or p value = 0.05, H0 is rejected and H1 is accepted, which means that there is an effectiveness of brain exercise on increasing cognitive function in the elderly in Tegalan Village, Kandat District, Kediri Regency.

Some respondents, namely 7 (25%) respondents from a total of 28 respondents in Tegalan Village, Kandat District, Kediri Regency, their cognitive function was still in the poor category before being given brain exercise training. After being given brain exercise training, it was obtained data from the post test test that the cognitive function of the elderly increased from the previous only 16

(57.14%) respondents in the good category increased to 25 (89.28%) respondents. Meanwhile, before being given brain exercise training, there were still 7 (25%) elderly respondents who were still in the category of less cognitive function which drastically decreased to 0% or none at all. There is a very significant score change in the cognitive function of the elderly between before and after being given brain exercise.

V. CONCLUSIONS

Before doing brain exercise, the elderly who had a good level of cognitive function were as many as 16 people (57.14%), who had a sufficient level of cognitive function as many as 5 people (17.86%), and who had a low level of cognitive function as many as 7 people (25%).

After doing brain exercise, the elderly have a good level of cognitive function as many as 25 people (89.28%), who have a sufficient level of cognitive function as many as 3 people (10.72%), and who have a low level of cognitive function at all (0%).

From the percentage above, it can be concluded that there is a significant increase between before and after brain exercise. After doing this brain exercise, the elderly will be able to optimize their cognitive function to improve memory and inhibit senility (dementia).

Data analysis with statistical tests using the Paired T-Test showed that the average value of the level of cognitive function before giving brain exercise was a scale of 16.71 and then increased to 24.82. The significance value or p value on brain exercise function is 0.000 and cognitive function is 0.002 with a significance level of 5% or = 0.05. It is known that the correlation value between before brain exercise and after brain exercise is 0.917. Because the significance value or p value = 0.05, H0 is rejected and H1 is accepted, it can be concluded that there is an effectiveness of brain exercise on increasing cognitive function in the elderly in Tegalan Village, Kandat District, Kediri Regency.

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