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BRAIN GYM AND COGNITIVE IMPROVEMENT IN ELDERLY DEMENTIA: A STUDY AT WORKING AREA OF MULYOREJO HEALTH CENTER

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Abstract

In the aging process, degenerative processes will emerge in the elderly, for example memory loss or dementia. Efforts are being made to improve cognitive function in the elderly by carrying out brain gym exercises for the elderly. The aim of this research is to see the effect of brain training exercises on improving the cognitive function of elderly people with dementia. The method in this research uses quantitative methods with a Pre-Experimental research design with a Pretest One Group Posttest approach with a sample of 36 respondents. The sampling technique uses Total Sampling. Data collection was carried out by administering the Mini Mental State Examination (MMSE) questionnaire. The results of the research showed that before the brain training exercises were given there were no elderly people in the category of no cognitive function disorders, and after being given brain training exercises to the elderly with dementia there were several elderly people with no cognitive function disorders. Based on the results of statistical tests on the questionnaire (MMSE) using the paired simple t test at $\alpha < 0.05$, a value of $\rho = 0.000$ was obtained, meaning that there was an effect after being given brain training exercise treatment on improving cognitive function in elderly people with dementia in the working area of the Mulyorejo Health Center. It can be concluded that brain training exercises can improve cognitive function in elderly people with dementia. It is hoped that you will be able to apply brain training exercises in your daily life.

Keywords: Brain Training Exercises (Brain Gym), Cognitive Function.

BACKGROUND

According to (WHO), an elderly person is someone who has entered the age of 60 years and over. The elderly are an age group in humans who have entered the final stage of their life phase (WHO, 2016). Elderly is part of the growth and development process where humans do not suddenly become old, but develop from infants, children, adolescents and become old.

Indonesia, as a developing country, ranks 4th in the world in terms of population. The country's successful health development efforts have resulted in a reduction in birth rates, morbidity, and mortality rates, as well as an increase in life expectancy. The life expectancy of men and women in Indonesia in 2010 was 68 years for men and 72 years for women, but this increased in 2020 to 70 years for men and 73 years for women (BPS, 2020).

Projections show that the life expectancy of the Indonesian population will continue to increase, so the percentage of elderly people in the total population is also expected to continue to grow. Based on data from the National Socio-Economic Survey (Susenas) in 2015, the number of elderly people in Indonesia reached around 21.5 million individuals, or around 8.43% of the total population of Indonesia. This data reflects that the number of elderly population tends to increase every year, which is likely to bring greater health challenges.

Data on the increase from the World Health Organisation (WHO) and the International Alzheimer's/Dementia Organisation revealed that in 2015, the number of individuals with dementia worldwide reached 47.5 million, with around 22 million of them located in the Asian region. In developed countries like America, there are more than 4 million elderly people suffering from dementia. In Indonesia, 2016 estimates state that there are approximately 1.2 million individuals suffering from dementia, and this is expected to increase to 2 million by 2030, and reach 4 million by 2050.

An increase in the number of elderly people is also obtained from the World Health Organisation (WHO), in 2020, Indonesia has an elderly population of 28.8 million people, making it the country with the largest number of elderly people in the world (Riskesdas, 2018). Data from the health profile submitted by the Ministry of Health in 2016 indicates that approximately 8.3% of the total population, or approximately 17 million individuals, are aged 60 years and above in Indonesia. In 2020, the number of people suffering from dementia in Indonesia reached approximately 1,016,800, with an estimated 314,100 new cases.

Based on population projections, the number of elderly people in Indonesia continues to increase every year. In 2017. the elderly population in Indonesia reached 23.66 million people. which is about 9.03% of the total population. Projections for 2020 show that the number of elderly people is around 27.08 million people, while for 2025 it is estimated to reach 33.69 million people. It is estimated that by 2030, the number of elderly people in Indonesia will reach around 40.95 million, and by 2035, it will reach 48.19 million (kemenkes RI, 2017). The percentage of the elderly population in Indonesia in 2017, in North Sumatra, was about 7.33% (Kemenkes RI, 2017).

Ageing is a condition characterised by a decrease in the body's ability to maintain balance in the face of physiological stress (Susanti, et al, 2018). In the aging process, changes occur in the musculoskeletal system, especially in muscles, including a decrease in muscle strength and muscle mass (Hartinah et al., 2019). The ageing process is closely related to the age factor and is characterised by a decline in body function (Firdaus et al., 2018). Ageing is a gradual process in which the ability of tissues to perform self-repair,

Regenerate, and maintain their normal function slowly declines, leading to an inability to fight infection and recover from damage (Darmojo, 2018). Although ageing is not a disease, it is rather a reduction in the body's ability to respond to stimuli from within and outside the body. It is important to recognise that older people are often more susceptible to various diseases. The aging process itself begins when a person reaches adulthood, with symptoms such as loss of muscle tissue, damage to the nervous system, and other body tissues that cause a gradual decline in body function (Darmojo, 2018). In the aging process, there will be a regenerative process in the elderly, for example, memory decline or dementia.

Dementia is a condition that refers to a significant decline in intellectual functioning that interferes with an individual's ability to carry out daily activities, interact socially, and carry out work tasks. It is caused by a brain disorder or disease, which can be chronic or develop slowly, and can result in a decline in thinking, memory, response, orientation, learning ability. Communication, judgement, and affects the ability to carry out routine activities (Dewi, 2018).

Dementia is an umbrella term often used to describe a significant and often gradual decline in cognitive function, the impact of which involves social, occupational and daily tasks (Activities of daily living). Signs and symptoms of dementia according to Asrori & Putri 2014) include increased difficulty in carrying out daily activities, difficulty determining time, date and place. Frequent memory loss, changes in nature and behaviour such as irritability and stubbornness.

If dementia is not treated immediately will have a negative impact on the elderly, including changes in behaviour in sufferers such as forgetting about themselves, antagonising people around them, and the elderly will usually experience wandering alone so that they will be easily lost because they do not remember the direction home (Dyah Nastiti, 2015). Therefore, to improve cognitive function in the elderly, brain gymnastics is a series of simple movements that have been designed to stimulate various parts of the brain or exercises involving body movements that can be done easily in various places and times. This movement involving hands and feet is designed to provide stimulation to the brain, with the intention of improving the balance between emotional aspects and rational thinking, improving sensory performance, and maintaining flexibility and body balance (Wardani, 2016). Polite language and culture are also helpful to keep good emotional aspect and rational thinking, they remind what Sembiring et al, 2022; Sembiring et al, 2023) have described in their findings.

Doing physical activities such as gymnastics is one method that can increase individual abilities and improve fitness levels (Astri, et al, 2017). Engaging in a brain exercise programme has a significant positive impact on the cognitive function of individuals who have not yet reached old age (Kartolo & Rantung. 2020). Brain exercise has also shown positive benefits for elderly individuals facing dementia (Yani & Silalahi, 2018). The Brain Training Movement programme in gymnastics has the potential to improve cognitive function in the elderly population (Abas, et al, 2020).

Brain training exercises are very useful for improving cognitive function in the elderly. Some research results also reveal this, such as according to research (Irasri, 2019) in the title Effect of Brain Gym Therapy on Short-Term Memory there are findings that more than half (58.3%) of the elderly experienced a mild decrease in the level of cognitive function before taking part in the brain gymnastics programme. After participating in the brain gymnastics program, more than three-quarters (75%) of the elderly experienced an increase in cognitive function and were categorised as having a normal cognitive level. The results of this study indicate that brain exercises have the potential to assist the elderly in improving their cognitive function. Therefore, it is expected that the elderly can routinely and effectively follow the brain exercise programme.

According to research (Awaludin, 2018) in the title The Effect of Brain Gymnastics with Dementia in Seniors shows that before participating in the brain gymnastics programme, the level of dementia among 25 respondents had the following pattern: 11 (44%) respondents experienced dementia at a low level of severity, and 5 (20%) respondents in the working area of Puskesmas Kesambi, Cirebon city also experienced dementia.

The results of research conducted by (Suhari, 2019) with the title Effect of Brain Gymnastics on Cognitive Function, showed that after following the brain gymnastics programme for 1 month, there was an increase in cognitive function in the elderly group who were part of the intervention. There was an increase of 33.33% in the

number of elderly people with an adequate level of cognitive function, while only 0.67% of these elderly people experienced an increase in cognitive function. Conversely, the number of elderly with a deficient level of cognitive function decreased from 86.67% to 53.33%.

Ana, (2018) reveals researchers measured cognitive levels using MMSE before being given brain gym on all elderly people then gave brain gym treatment to respondents with 15 minutes every 3 times in 1 week for 2 weeks on all samples then researchers examined the improvement of cognitive function again Post test) after intervention for 2 weeks or the 6th treatment day.

Based on a preliminary survey conducted by researchers in the working area of the Mulyorejo Health Center on 23 October 2019, with an open interview conducted by researchers with one of the administrative staff employees in the working area of the Mulyorejo Health Center, the number of elderly people in 2019 was obtained, middle age (45-59 years) the number of men was 3,837 people and women were 3,838 people. At an advanced age (160-69 years) the number of men is 1,009 people and women are 1,041 people. While the elderly (>70 years) the number of men is 624 people and women are 750 people. Researchers took measurements on 10 elderly respondents or elderly with the results of 5 elderly with mild dementia, and 3 elderly with moderate dementia, 2 elderly with no dementia.

Based on the above background and initial survey at the research location, the researcher is interested in taking the title Effectiveness of Brain Gym on Improving Cognitive Function in Elderly Dementia in the working area of the Mulyorejo Health Center.

Research Methods

This study uses quantitative analytical research. The location used in this research is the working area of the Mulyorejo Health Center. The research time was carried out (starting from the preparation of the proposal until the final preparation) in February 2019 - July 2019. the population of elderly elderly (60-69 years) who were only in working area of Mulyorejo Health Center, total 36 people. The sample that will be studied in this study is 36 people.

RESULTS

To determine the effectiveness of brain training exercises (brain gym) on improving cognitive function in elderly dementia in the working area of Mulyorejo Health Center, Deli Serdang Regency in 2019 which was carried out from February to March 2019. This research was conducted on 36 elderly dementia respondents. The research method uses an MMSE questionnaire sheet, consisting of 11 assessment questions about cognitive function in the elderly, After the research results are obtained, the data is input using SPSS. For the research results as follows.

Univariat Analysis

This univariate analysis was conducted to determine the frequency distribution and presentation of each variable and the difference in cognitive function in elderly dementia before and after being given Brain Gym in the working area of Mulyorejo Health Center, Deli Serdang Regencyt.

Table 4.1: Frequency Distribution of Respondents Based on Characteristics in the working area of Mulyorejo Health Center, Deli Serdang Regency, 2019

Characteristics	Frequency	Presentase (%)
Age		
60-65 years	23	63.9
66-70 years	13	36.1
Total	**36**	**100.0**
Gender		
Female	29	80.6
Male	7	19.4
Total	**36**	**100.0**
EDUCATION		
Secondary high school	21	58.3
Senior high school	15	41.7
Total	**36**	**100.0**

Based on Table 4.1 shows that the characteristics of the most respondents in the age range 60-65 are 23 respondents (63.9%), based on gender it can be seen that the majority are female as many as 29 respondents (80.6%), based on the last education, the most junior high school as many as 21 respondents (58.3%).

Cognitive function in respondents before being given Brain Gym

Table 4.2: Frequency Distribution of Respondents with Cognitive Function Before Performing Brain Training Gymnastics in the working area of Mulyorejo Health Center, Deli Serdang Regency in 2019

Pre test	Frequency	Percentage
No cognitive dysfunction	0	0
Mild cognitive impairment	18	50%
Moderate cognitive impairment	17	47,2%
Severe cognitive impairment	1	2,8%
Total	**36**	**100,0**

Based on table 4.2 above, it is known that of the 36 respondents, 18 respondents (50%) had mild cognitive function impairment, while 17 respondents (47.2%) had moderate cognitive function impairment and 1 respondent (2.8%) had severe cognitive function impairment.

a. Cognitive function in respondents after being given Brain Gym

Table 4.3: Frequency distribution of respondents with cognitive function of the elderly after doing brain training exercises in the working area of Mulyorejo Health Center, Deli Serdang Regency 2019.

Post Test	Frequency	Percentage
No cognitive dysfunction	5	13,9%
Mild cognitive impairment	25	69,4%
Moderate cognitive impairment	6	16,7%
Severe cognitive impairment	0	0%
Total	36	100,0

Based on table 4.3 obtained data after brain training exercises (brain gym) on improving cognitive function in the most respondents with mild cognitive function disorders as many as 25 respondents (69.4%), moderate cognitive function disorders 6 respondents (16.7%), and no cognitive function disorders 5 respondents, (13.9%).

Bivariate Analysis

Bivariate analysis was conducted to see any differences in cognitive function in respondents before and after brain training exercises (Brain Gym) in the working area of Mulyorejo Health Center in 2019.

Table 4.4: Results of pre-test and post-test normality test Cognitive function Respondents

TEST OF NORMALITY KOLMOGROV-SMIRNOV			
Result		**Sig**	**Description**
Cognitive Function in the Elderly	*Pre-Test*	.375	Normal Distributions
	Post-Test	.148	Normal Distributions

In table 4.4 above before the statistical test is carried out, a normality test is first carried out. data, namely using the Kolmogorov-Smirnov Test because the data is less than 50 (n = 36). In this normality test, the data is said to be normally distributed if the p value is> 0.05. it can be concluded that the data is normally distributed. because the data is normally distributed, the statistical test used is the paired sample T-Test test with a p value of 0.000.

Table 4.5: Analysis of changes in cognitive function of the elderly

	Minimum	**Maximum**	**Mean**	**S.D**	**p-value**
Pretest	17	23	20.36	1.710	0,000
Post-test	18	25	22.11	1.582	

In table 4.5 above shows that the lowest pre-test score is 17 while the highest is 23, and at the lowest post-test score with a score of 18 the highest score is 25. Followed by the average cognitive function of respondents carried out the intervention before being given brain training exercises is 20.36 with a standard deviation of 1,710 while after brain training exercises the average cognitive function of respondents is 22.11 with a standard deviation of 1,582. Statistical test results (P-value <0.05), it can be concluded that there is a significant increase in cognitive function in respondents. Based on the results of paired sample T-test research from 36 respondents there is a significant value (2-tailed) p value of 0.000 0.05 which means the sig value (2-tailed) is smaller than 0.05 which means there is a difference in cognitive function in respondents before and after the provision of brain training exercises (Brain Gym), it can be concluded that it is very meaningful.

DISCUSSION

Characteristics of Elderly Dementia

Based on table 4.1, the highest age of the elderly in this study was in the age range of 60-65 years as many as 23 people (63.9%).

An elderly person is someone who has reached an age above 60 years. According to Triyanto (2019), at this stage the elderly usually experience weakness in the physiological functions of their organs. Research by Keswara, U. et al. (2021) shows that most of the elderly are over 50 years old, where it is known that as age increases, a person will experience a decrease in cognitive function.

In the elderly, memory is one of the cognitive functions that often decreases. Various types of cognitive impairments experienced include consistent forgetfulness, time disorientation, impairment in the ability to express opinions and problem solving,

impairment in relationships with the community. impairment in daily activities and intellectual interests, and impairment in self-care (Uliyah, Aisyah, & Rahmmina, 2015).

The elderly experience a persistent decline in intellectual function, characterised by impairments in at least 3 of the 5 components of neurological function, including language, memory, vision and comprehension. Ageing causes anatomical changes and the ability of tissues to self-repair or replace and maintain their normal function decreases, leaving them unable to fight infection or repair damage.

The ageing process has a significant effect on human brain cells and function. This is because as we age, changes occur in the structure and function of cells, tissues and organ systems. These changes generally result in deterioration of physical and mental health, which in turn can affect the economic and social conditions of the elderly. Overall, this will affect the activities of daily living (ADL) (Awalludin, 2019).

Based on theory, elderly people over the age of 60 are at high risk of developing dementia. Dementia is quite common in the elderly, affecting around 10% of those aged over 65 years and reaching 47% in the age group over 85 years. Around 10-20% of dementia cases are reversible or treatable. In Indonesia, the prevalence of dementia in the elderly aged 65 years is around 5% of the elderly population, which increases to 20% in those aged 85 years and above (Amirullah, 2011). Agus, et al (2002), explain that the decline in cognitive function (dementia) usually begins to appear after the age of 60 years, with the risk increasing with age. The term dementia is used to describe a clinical syndrome with symptoms of decreased memory and other intellectual functions.

In the characteristics of the gender of the majority of elderly women as many as 29 people 180.6%) The results of this study indicate that the majority of elderly people are female, the results of this study are supported by the results of research by Rekawati (2018), which states that the life expectancy of women is longer than that of men.

In the characteristics of the elderly with the level of education, it can be seen that the data shows that the most education is junior high school as many as 21 people (58.3%), these results are in line with Rekawati's research (2019) which states that elderly people with low education have a risk of dementia of 2.025 times more than elderly people with high education. According to Rolstad (2020), a higher level of education can increase tolerance to disease in the brain and reduce the risk of developing dementia. People with higher education tend to show better neural function in their brains compared to those with lower education, potentially reducing the risk of developing dementia.

Cognitive function in elderly dementia before being given brain training exercises

Cognitive function in elderly dementia before doing brain training exercises obtained data that severe cognitive function impairment in the elderly as many as 1 person (2.8%), moderate cognitive function impairment in the elderly as many as 17 people (47.2%), and mild cognitive function impairment in the elderly as many as 18 people (50% The results of this study are in line with research (Martini Agus, et al 2020) One way to improve cognitive function is by doing brain training exercises. Brain training gymnastics is a simple movement that is done to improve memory / cognitive function in the elderly.

Cognitive function disorders are divided into 3 parts, namely mild cognitive function disorders, moderate cognitive function disorders, and severe cognitive function disorders, each score has a score that will be the value to determine the cognitive function of the elderly. Mild cognitive function impairment with a score of 21-23, moderate cognitive function impairment 17-20, severe cognitive function impairment <17.

According to Dewi Rhosma (2019), one form of useful exercise is gymnastics. Doing gymnastics regularly and correctly for a sufficient period of time can slow down the degeneration process that occurs due to aging, form positive psychological attitudes, and provide stimulation for weakened nerves in the elderly. Gymnastics is a body exercise that is deliberately created, arranged systematically, and carried out consciously with the aim of forming and developing a harmonious person. In the elderly, the decline in brain and body capabilities makes them more susceptible to disease, affects cognitive function, and can lead to disillusionment.

According to the researchers, this proves that brain gym movements can be beneficial in improving blood flow and oxygen to the brain so as to improve coordination and concentration, clear the mind, keep the body relaxed and reduce mental fatigue (stress), so that cognitive function can be maintained and maintained. Furthermore, Ide (2008) revealed that the basic principle of brain gym is to keep the brain fit and prevent senile dementia.

Basically, brain training gymnastics is a series of simple movement exercises designed to optimise the function of the various centres in the human brain. This exercise can increase blood and oxygen flow to the brain, and improve memory, concentration, body energy, blood pressure regulation, vision, physical balance, and coordination (Anggriyana and Atikah, 2020).

The human brain acts as the center of regulation of the human body system. The brain is responsible for various sensory experiences and responses to the human ability to perform deliberate movements, as well as facilitating mental processes such as memory, emotion, intelligence, communication, and the formation of character or personality. The human ability to think requires the help of tools or media to maintain its sharpness. Research by Ida (2021) shows that brain training exercises can help improve memory skills in the elderly.

Cognitive Function in Elderly with Dementia After Brain Gymnastics

After brain gymnastics was conducted, it was found that the most elderly people had mild cognitive impairment, as many as 25 people (69.4%), elderly people with moderate cognitive impairment were 6 people (16.7%). Elderly people who did not have cognitive impairment were 5 people (13.9%) and there were no elderly people with severe cognitive impairment.

So in this case it is stated that there is an increase in cognitive function in the elderly, the results of the study showed that cognitive function in the elderly who do brain gymnastics regularly 3 times a week for 10 minutes can reduce the level of dementia. According to researchers, this proves that brain gymnastics movements (brain gymnastics) can be useful in facilitating blood flow and oxygen to the brain so that it can improve coordination and concentration, clear the mind, keep the body relaxed and reduce mental fatigue Istress),

So that cognitive function can be maintained and preserved According to the researcher's assumption that brain gymnastics has a good effect on improving cognitive function. This is because brain training exercises can train the thinking ability and memory of the elderly. The results of this study are that the average cognitive function of the elderly who underwent intervention before brain training exercises was 20.36 with a standard deviation of 1,710, while after brain training exercises the average cognitive function of the elderly was 22.11 with a standard deviation of 1,582. The results of the statistical test p value = 0.000 (P-value <0.05), so it can be concluded that there is a significant increase in cognitive function in the elderly

The results of this study are consistent with Astuti et al., (2018) entitled "The Effect of Brain Gymnastics on Cognitive Function in the Elderly". The results of the Wilcoxon Signed Rank test showed a Z value of 3.416 with a significance value (p value) of 0.001, smaller than the value a = 0.05 that has been set. There was an average increase in cognitive function of 1.65 between before and after brain gymnastics. These results indicate that the null hypothesis (HO) is rejected and the alternative hypothesis (Hal is accepted, which means that there is an effect of implementing brain gymnastics 3 times a week for 4 weeks on the cognitive function of the elderly at the Budi Sejahtera Banjarbaru Tresna Werdha Social Home. However, in this study, mild cognitive dysfunction increased, because the elderly with moderate cognitive dysfunction experienced an increase to mild cognitive dysfunction, the same as the elderly who had mild cognitive dysfunction who experienced an increase to the elderly in the category of No cognitive dysfunction. In the results of this study, it was found that there were several elderly with moderate cognitive dysfunction who remained in their category, this could happen due to several factors, the triggering factors were age, education and gender.

Cognitive Function of Elderly Dementia Based on Age

Before and After Brain Exercise Based on age characteristics, it was found that six people with cognitive dysfunction were in the age range of 66-70 years. The older a person is, the more difficult it is to improve their cognitive function. Research by Keswara. U. et al (2020), shows that most elderly people are over 60 years old, with general knowledge that cognitive decline increases with age. Data from various studies show that dementia often occurs in elderly people aged 60 years and over, with two main categories: Pre-senile Dementia (under 60 years) and Senile Dementia (60 years and over). Around 56.8% of elderly people experience Alzheimer's type dementia, with an incidence rate of 4% at age 75, 16% at age 85, and 32% at age 90. Cognitive decline usually begins after age 60 with the risk increasing with age. The term dementia is used to describe a clinical syndrome with symptoms of decreased memory and other intellectual functions.

Cognitive Function of Elderly Dementia Based on Education Level Before and After Brain Training Exercises

The next factor is Education, data shows that elderly people with moderate cognitive impairment generally have an educational background up to junior high school level. Many elderly people experience limited education because at that time information was not widely available, so they were only able to complete basic education. Low levels of education can hinder their ability to receive and process information at this stage INugroho et al., 2017). Cognitive function plays an important role in a person's daily activities. Mubarak (2006) explains that education is a person's intellectual

foundation, where the higher a person's education, the greater their ability to absorb and understand information. This means that broad knowledge and insight are important factors that shape a person's actions and behavior. Research by Agustin (2017) supports this by showing that a high level of education can result in better cognitive development, allowing individuals to assess problems more realistically and use more effective coping strategies. Lanawati (2013), as quoted in Nugroho, Asti, & Kuatno (2017), also stated that the higher a person's level of education, the greater their access to knowledge and information.

Cognitive Function of Elderly Dementia Based on Gender Before and After Brain Gymnastics

The characteristics of gender show that the majority of elderly women are 29 people (80.6%) According to researchers, female respondents are more likely to experience dementia, because women's life expectancy is greater than men and women's stress levels are heavier than men so that women are more likely to experience dementia, for example often forgetting the orientation of time and place, easily forgetting things that have just been done

Effectiveness of Latin Brain Gymnastics (brain gym) on Improving Cognitive Function in Elderly Dementia in the Working Area of the Mulyorejo Health Center

The results of this study showed that before being given brain gym, out of 36 people, it showed that 18 people (50%) had mild cognitive dysfunction, while 17 people (47.2%) had moderate cognitive dysfunction and 1 person (2.8%) had severe cognitive dysfunction. Meanwhile, after brain gym was given to increase cognitive function in elderly with dementia, the most with mild cognitive impairment were 25 people (69.4%), moderate cognitive impairment were 6 people (16.7%), and no cognitive impairment were 5 people (13.9%). In the pre-test score, the lowest score was 17 while the highest was 23, and in the post-test score, the lowest score was 18, the highest score was 25.

Continued with the average cognitive function of the elderly who underwent intervention before brain gym was given 20.36 with a standard deviation of 1,710, while after brain gym, the average cognitive function of the elderly was 22.11 with a standard deviation of 1,582. The results of the statistical test (P-value <0.05), it can be concluded that there is a significant increase in cognitive function in the elderly, the paired sample T-test of 36 people has a significant value (2-tailed) p value = 0.000 0.05 which means that the sig value (2-tailed) is smaller than 0.05 which means that there is a difference in cognitive function in the elderly before and after being given Brain Gym gymnastics, so it can be concluded that it is very significant.

This study is in line with Zulrizki's study (2018) entitled "The Effect of Brain Gym on Improving Cognitive Function in the Elderly". Before brain gymnastics, most elderly people with dementia had moderate cognitive scores, namely 10 people (50%). After brain gymnastics, most elderly people increased their cognitive scores to mild, namely 15 people (75%). The results of the Paired Sample t-test showed that the mean pre-test was 20.25 and the mean post-test was 24.60, indicating a significant increase in cognitive function before and after treatment. Thus, the null hypothesis (Ho) is rejected, which indicates the influence of brain gymnastics on the cognitive function of the elderly at the Posyandu Lansia Dusun Kradenan, Srimulyo, Piyungan, Bantul, D.I. Yogyakarta.

CONCLUSION

Conclusion of the research results entitled Brain Gym and Cognitive Improvement in Elderly Dementia: A Study at Working Area of Mulyorejo Health Center "can be concluded that:

1. The level of cognitive function of the elderly before brain gym was carried out It was found that mild cognitive dysfunction was 18 people (50%), while moderate cognitive dysfunction was 17 people (47.2%) and severe cognitive dysfunction was 1 person (2.8%).
2. The level of cognitive function of the elderly after brain gym was carried out It was found that there were no more elderly with severe cognitive dysfunction, and elderly with moderate cognitive dysfunction experienced an increase to mild cognitive dysfunction, and in elderly with mild cognitive dysfunction there was an increase to no cognitive dysfunction with data Elderly with mild cognitive dysfunction 25 people (69.4%), Elderly with moderate cognitive dysfunction 6 people (16.7%), Elderly with no cognitive dysfunction 5 people (13.9%)
3. Effectiveness of Brain Gym)

On Improving Cognitive Function in Elderly with Dementia in the working area of working area of Mulyorejo Health Center, Deli Serdang Regency. The results of the statistical test p value = 0.000 <0.05, it can be concluded that there is a significant increase in cognitive function in the elderly. paired sample T-test from 36 people there is a significant value (2-tailed) p value = 0.000 <0.05 which means the sig value (2-tailed) is smaller than 0.05 which means there is a difference in cognitive function in the elderly before and after being given brain training exercises (Brain Gym).

SUGGESTIONS

After conducting brain training exercises to improve cognitive function in elderly dementia, the researchers can provide suggestions related to the results and discussion, this study shows for:

1. For working area of Mulyorejo Health Center

   Can make Brain Training Exercises a program for prolanis who visit the health center
2. For Educational Institutions

   Become a reference source in the library and can be a research guide for students if they conduct research on the Effectiveness of Brain Training Exercises on Improving Cognitive Function in Elderly Dementia
3. Morning Patients and families are expected to be able to increase the knowledge of patients and families about the importance of Brain Training Exercises to improve cognitive function in the elderly.
4. For further researchers, it is hoped that further researchers can provide brain gym interventions for 2 weeks routinely every day to see changes in stress levels in elderly people with dementia.

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