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THE APPLICATION OF BRAIN GYM IN IMPROVING COGNITIVE FUNCTION IN ELDERLY WITH DEMENTIA

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ABSTRACT

Dementia is an irreversible progressive brain disorder that slowly makes sufferers experience a decrease in memory, thinking, behavior, and the ability to carry out daily activities, where symptoms usually appear at the age of 60 years and above. The application of brain exercises is one of the interventions in improving cognitive function in the elderly with dementia. This study aims to improve cognitive function in the elderly with dementia. This type of research is descriptive using a case study approach method. Data collection techniques in this study were interviews and observations. This study uses inform consent sheets, assessment sheets, music and observation sheets. Respondents in this study were two elderly people with dementia with age criteria of 60 years and over. The results showed that the interpretation before the intervention in both subjects was subject I the result was 20 and subject II the result was 19. Interpretation after intervention subject I became 22 and subject II became 23. This study proves that brain exercises can improve cognitive function in the elderly with dementia. It is hoped that brain gymnastics can be used as one of the interventions to reduce cognitive function in the elderly with dementia.

INTRODUCTION

Dementia is a progressive and irreversible brain disorder that gradually damages memory and thinking skills, and eventually the ability to perform even the simplest tasks. In most people with dementia, symptoms first appear in their 60s (Triono g h, 2020).

Data from the World Health Organization (2021) and Alzheimer's Disease International show that more than 55 million people worldwide currently live with dementia, with more than 60% of them residing in low- and middle-income countries. Nearly 10 million new cases occur each year.

In Indonesia, the prevalence of dementia among older adults aged 65 years was 5% of the elderly population in 2010. This prevalence increased to 20% among those aged 85 years and above (Amirullah, 2011). The increase in dementia prevalence in Indonesia is

approximately 0.5% per year at ages 65–69, 1% per year at ages 70–74, 2% per year at ages 75–79, 3% per year at ages 80–84, and 8% per year at ages >85 (Hatmanti & Yunita, 2019).

Data obtained from the Aceh Provincial Central Bureau of Statistics (2015) show that the number of elderly with dementia, aged over 65 years, has reached approximately 1,000 people and is expected to continue increasing every year, as evidenced by the rise in the elderly population from 2010 to 2014.

If not properly managed, dementia in the elderly can affect their daily living activities and overall health. There is a need for healthcare services to address these issues and improve the quality of life of older adults. Elderly care services should involve family-based, community-based, and institutional-based care (Fatma, 2016).

Behavioral and psychological disorders in the elderly with dementia are often found as BPSD (Behavioral & Psychological Symptoms of Dementia). These changes are multifactorial or biopsychosocial, leading to problems such as aggressive behavior, wandering without purpose, restlessness, impulsivity, repetitive questioning, delusional jealousy, suspicion, hallucinations, and misidentification (Husmiati, 2016).

Efforts to slow down cognitive decline due to aging and as a form of stimulation to improve brain function can be carried out through brain gym exercises. Brain gym consists of a series of movements based on basic body movements. The aim of these exercises is to stimulate the performance of the left and right hemispheres (lateral dimension), to relax or balance the back and front of the brain (focus dimension), and to stimulate the sensory/emotional system, namely the midbrain (limbic system) (focus dimension).

Brain gym can bring benefits such as reducing emotional stress, achieving clearer and sharper thinking, improving interpersonal relationships, and creating a more relaxed and enjoyable learning or working environment. Other benefits include enhancing language skills and initiative, making individuals more enthusiastic, innovative, efficient, and healthier as stress decreases and academic/work performance improves. Brain gym is also very easy to practice, as anyone can do it anytime and anywhere. It helps the brain work through refreshment and exercise, opening previously blocked brain areas (Umam K, Suryadi B, Daeli W, 2021).

Research conducted by Umam, Suryadi, and Wesli (2021) showed that brain gym has an effect on cognitive function in elderly dementia patients. Brain gym significantly improved cognitive function, with pre-test and post-test scores of 9.15 and 6.7.14, respectively. These results are consistent with previous studies showing that brain gym

can improve memory in older adults, with a significant value of p = 0.005 (p < 0.05). Brain gym also provides many benefits, including reducing emotional stress, clearer thinking, improved interpersonal relationships, more relaxed and enjoyable learning/working environments, enhanced language and memory skills, and making individuals more active, innovative, and efficient.

Data obtained from interviews with the village head and Posyandu cadres in Ceurih village revealed a total population of 3,905 people, consisting of 1,930 males and 1,975 females. Among them, 99 individuals were recorded as having hypertension in 2022, consisting of 20 men and 79 women.

RESEARCH METHODS

This research is descriptive in nature, using a case study approach. The study was conducted on two subjects suffering from dementia in Reuhat Tuha Village, Sukamakmur District, Aceh Besar.

The therapy was applied twice a week with a duration of 10–15 minutes. The instruments used in this study included an informed consent form, assessment sheet, standard operating procedure sheet, music, and an observation sheet.

RESULTS AND DISCUSSION

The results of the study showed that the application of brain gym was effective in improving cognitive function in elderly individuals with dementia.

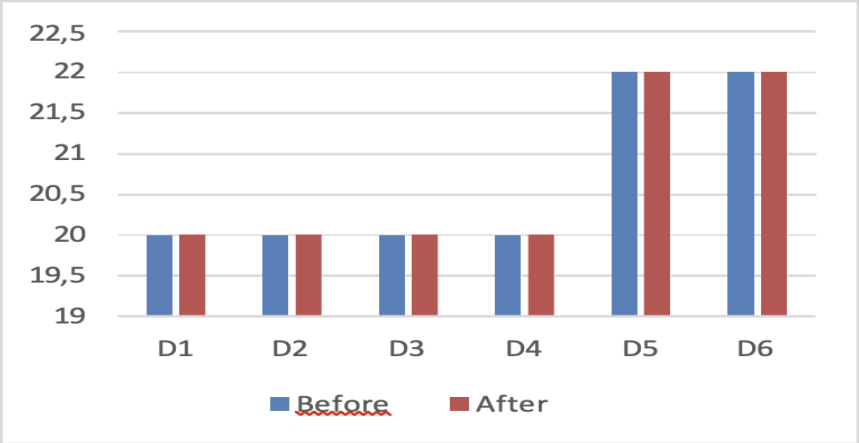

Figure 1. Observation results of subject I

Based on Figure 1, it was found that there was an improvement in cognitive function in Subject I after four sessions of brain gym. At the fifth session, an increase was observed, with the initial score being 20 and the final score reaching 22.

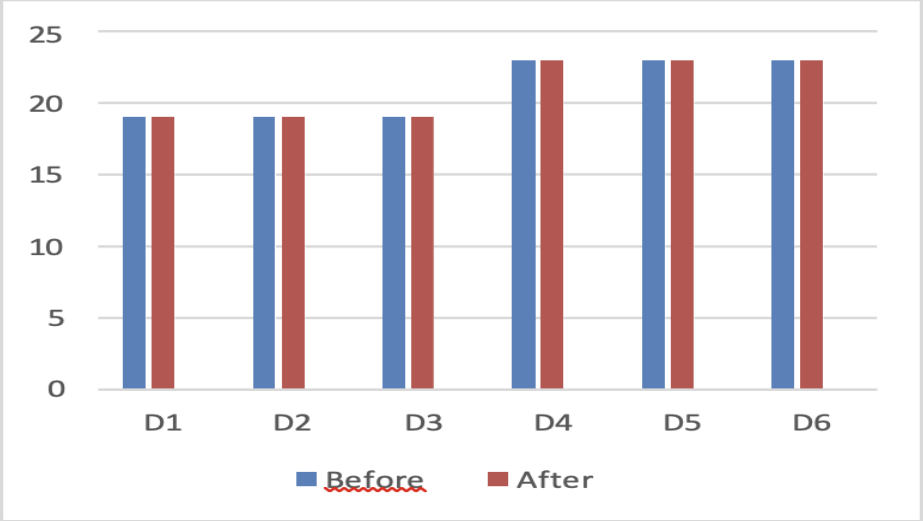

Figure 2. Observation Results of Subject II

Based on Figure 2, there was an improvement in cognitive function in Subject II after three sessions of brain gym. At the fourth session, an increase was observed, with the initial score being 19 and the final score reaching 23.

DISCUSSION

The study results showed that there were changes/improvements in cognitive function in Subject I, with scores increasing from 20 to 22, and in Subject II, with scores increasing from 19 to 23.

The authors assume that there is a difference in the level of dementia before and after the application of brain gym in patients, with the intervention carried out three times a week for two weeks. The decrease in the level of dementia is attributed to the body's ability to obtain an adequate oxygen supply, physical exercise, and adaptation to a healthy lifestyle.

According to the theory presented by Oktaviani (2017), the results of her study showed that before the intervention, 9 older adults (36%) had mild dementia, while after the intervention, 14 older adults (56%) were in the mild dementia category. Statistical tests yielded a p-value of 0.011, which means $p < 0.05$, indicating a significant effect of brain

gym on reducing dementia levels among older adults in the working area of Kesambi Community Health Center, Cirebon City, in 2017.

The researchers assume that several factors influence the success of therapy, including age, genetics, gender, lifestyle, and education level (Bahrudin, 2017). Older adults are commonly associated with dementia, which usually occurs after the age of 60, with risk increasing as age advances. Genetics may contribute to dementia due to genetic mutations that increase the risk within families.

Regarding gender, women are more likely than men to experience dementia because their life expectancy is higher. Elderly women are at greater risk of cognitive decline compared to men. This is due to the role of endogenous sex hormone levels in cognitive function changes. Estrogen receptors have been found in brain areas responsible for learning and memory, such as the hippocampus. Low estradiol levels in the body have been linked to a decline in overall cognitive function and verbal memory. Estradiol is believed to be neuroprotective, limiting damage caused by oxidative stress and protecting nerve cells from amyloid toxicity in Alzheimer's patients (Yuliati & Hidaayah, 2017).

Lifestyle also contributes to cognitive impairment and dementia in the elderly. Lack of physical activity, especially regular exercise, can trigger dementia; therefore, it is recommended that older adults remain physically active to prevent and reduce the risk of dementia. Education level is another factor associated with dementia. The higher a person's education, the more knowledge they acquire, making them more aware of changes in themselves compared to those with lower education levels. The lower the education level, the greater the risk of dementia. Education can compensate for all types of neurodegenerative and vascular disorders and also influences brain weight. More educated individuals tend to have greater brain weight and better cognitive and neurodegenerative resilience compared to those with lower education levels (Sari, Ningsih, & Pratiwi, 2017).

In this study, both patients had a low education level, having only completed elementary school. Subject M only attended school until the second grade, while Subject Z completed up to the fourth grade. Data from the study also showed that Subject I was 67 years old and Subject II was 69 years old, both classified as elderly.

The capacity of the human brain can be optimized through various movements. Brain gym activities provide stimulation to the brain, thereby improving memory strength, cognition, alertness, concentration, creativity, and problem-solving ability. Simple and easy brain gym movements can synchronize all parts of the brain to enhance

mental/cognitive ability, foster a sense of togetherness, and build self-esteem. These simple physical exercises can be easily followed by older adults as well as individuals of all ages.

Data collection revealed that Subject I experienced an improvement in cognitive function with a score of 22, while Subject II showed an improvement with a score of 23. This difference is attributed to age differences between the two subjects, as well as stress, which also affected blood pressure changes in both subjects.

CONCLUSION

The results of the study showed an improvement in cognitive function in Subject I, with the score increasing from 20 to 22, and in Subject II, with the score increasing from 19 to 23.

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