

The effect of brain GYM on the dementia and depression reduction of the elderly

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ABSTRACT

This study aims to determine the effect of brain gym on decreasing the level of dementia and depression in the elderly in the Health Center Community of Mulyorejo in Deli Serdang Regency. The population of this study was 5765 elderly people. The sampling technique uses the Slovin formula and it is determined through inclusion criteria using a purposive consecutive method so that the total sample of 30 respondents is divided into two groups, 15 respondents with dementia and 15 respondents with depression.

A quasi-experimental pre-post test design was used, where a control group wasn't used, then a pre-test is followed by intervention in each group and at the end a post-test in each group was conducted. Data analysis used the Wilcoxon test due to the unusual distribution of the data.

The results of the study on the dementia variable obtained p-value ($p = 0.000 < 0.05$) and the depression variable value ($p\text{-value} = 0.006 < 0.05$), so it can be concluded that the brain gym has an effect on decreasing the level of dementia and depression in the elderly.

The use of brain gym can be one of the considerations in nursing intervention as a complementary therapy to reduce the level of dementia and depression in the elderly, and is expected to be carried out routinely during the activities of the elderly of each Posyandu (integrated health care center).

Keywords: Brain gym, Dementia, Depression, Elderly

Introduction

The elderly is a series of stages that must be passed by every human being. This stage is called the life cycle. The human life cycle starts from pregnancy, breastfeeding, infants, children, adolescents, adults, and elderly then death.

So it can be said that the elderly are the final stage of the development of human life [1]. The development of the elderly population according to the estimations of the World Health Organization (WHO) will increase in 2025 compared to 1990 in some countries such as China 220%, India 242%, Thailand

337%, and Indonesia 440% [2].

Improved elderly health in Indonesia made the government to continue to strive improving the quality of health services that can lead an increase in life expectancy.

As a result, the number of senior residents will continue to grow and there is a tendency to skyrocket faster. In North Sumatra Province the number of elderly has increased from 76,770 in 2010 to 79,400 in 2011, while in 2012 the number of elderly was 82,450 and in 2013 the number increased to 86,000 [3].

The increasing population of the elderly in Indonesia caused various health problems and diseases. One of the problems was a cognitive impairment which manifests acutely in the form of contusions and chronic in the form of dementia [4].

Dementia is the 4th leading cause of death after heart disease, cancer and stroke. Till today, there is an estimation that the 30 million world population who experienced dementia for various reasons such as illness, trauma, drugs, and depression. According to Lumbantobing, (2016) there is the brain decreases of the the weight and the change of the human brain structure in

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the elderly and the estimation of worldwide elderly people experience dementia is increased [5].

Depression is a disorder or mental disorder characterized by depressed moods, loss of pleasure or interest, feeling guilty, sleep and eating disorders and decreased concentration. The elderly can look sad, cry, be anxious, be sensitive, or be paranoid, feel useless, lose interest and find it difficult to concentrate [6].

The lifetime prevalence of depression is high [7-10].

The prevalence of depression in the elderly is generally 25-50% [11]. It is estimated that 40% of depression in old age is undiagnosed because the depiction of depression in the elderly is different from younger age and will increase with age [11].

Dementia can arise because of depression in the elderly. Cognitive impairment occurs and it is often called pseudodementia. Among parents with depression, about half showed a significant decrease in cognition tests [12].

Dementia and depression require special, long-term, personal care and more supervision. Therefore, a more advanced but simple way of care handling to reduce the burden of care and even to facilitate dementia and depression sufferers in a period of treatment is needed. Brain gym should be provided to decrease the problems of dementia and depression.

Brain gym was created deliberately arranged systematically and carried out consciously with the aim of forming and developing a harmonious personality [13]. Brain gym include many simple movements that can balance each part of the brain, attract the level of brain concentration and also it is a way for the blocked parts of the brain to function optimally. According to Kulkarni, and Khandale, 2019 brain gym exercises show that it can activate the whole mind and body [14]. Furthermore, Azizah, Martiana, and Soedirham, 2017 explain brain gym has a significant effect on improving cognitive function of elderly and reduces the level of stress in the elderly face a life stressor [15].

Brain gymnastics opens parts of the brain that was previously closed or stunted so that learning or work activities can take place using the whole brain. As a result, emotional stress is reduced and the mind clearer. Relations between humans, and the atmosphere of learning/working is more relaxed and happy. A clear mind, reduced emotional stress, feel relaxed and happy also can reduce the level of dementia and depression in the elderly. Brain gym is one of the examples of an exercise that can be done by the elderly anywhere, and does not require a lot of energy. It remains us on the points of Andi, Dharma, Purwanto, Firdaus, and Loriana (2019), Suhari., Astuti., Rahmawati, and Musviro. (2019), Hidaayah, 2017. Alvita, Galia Wardha., and Huda, Sholihul. 2020. Adriani., Imran, Mawi., Amani., and Ilyas 2020, Effendy, Novi, Utami, 2019 have discussed about the function of brain gym [16-21].

Based on a preliminary survey from health workers conducted at the Mulyorejo Health Center in Deli Serdang District, the elderly population experienced dementia and depression. The number of the elderly in the working area of Mulyorejo Health Center in 2018 was 5765 people interviews from 6 elderly who came at that time to the Mulyorejo Health Center Community on Monday, January 7, 2019, showed that four of

them often forget the day, month, and year the messages conveyed by their families, and where to place their goods.

From the results of this survey and the background, the authors wish to research on the effect of brain gym on decreasing levels of dementia and depression in the elderly in the work area of Mulyorejo Health Center Community of Deli Serdang Regency. Based on the background, the problems in this study are: How do the brain training exercises How influence dementia and depression levels decrease in the elderly in the working area of Mulyorejo Health Center, Deli Serdang Regency 2019.

Materials and Methods

A quasi-experimental research design pre-and -post test design was used in this research. This study was conducted in the Working Area of the Mulyorejo Health Center Community in Deli Serdang Regency during June to October 2019.

The sample in this study were all elderly in the working area of Mulyorejo Health Center in Deli Serdang Regency, as many as 5765 people. The purpose of this study was to analyze the Effect of brain gym on decreasing dementia and depression levels in the Elderly in the working area of the Mulyorejo Health Center in Deli Serdang Regency in 2019.

Results and Discussion

Characteristics of respondents

In this study the number of respondents was 30, divided into two groups: 15 respondents in the dementia group, and 15 respondents in the depression group. The distribution of respondents shown in **Tables 1 and 2**.

Table 1. Distribution of Characteristic Frequency of respondents who carry out Brain Gym

No.	Characteristics	Dementia		Depression	
		F	(%)	f	(%)
1	Age				
	60 – 67 years	10	66,7	10	66,7
	68 – 74 years	5	33,3	5	33,3
	Total	15	100.0	15	100.0
2	Education				
	Primary School	1	6,7	5	33.3
	Secondary High School	5	33,3	4	30.3
	Senior High School	9	60,0	6	36.3
	Total	15	100.0	15	100,0
3	Sex				
	Female	12	80,0	10	66.7
	Male	3	20,0	5	33,3
	Total	15	100.0	15	100,0

Based on the results of the research in **Table 1** respondents who received brain gym with the majority of dementia aged 60-67 years were 10 respondents (66.7%), the majority of high

school-educated were 9 (60%), and respondents were female (80%).

Whereas the majority of depression respondents aged 60 - 67 years were 10 respondents (66.7%), 6 respondents had a high school education (36.3%) and 10 respondents were female respondents (66.7%).

Characteristic frequency of respondents who carry out brain gym are clear in **Table 1**.

Table 2. Frequency Distribution of respondents pre-test and post-test treatment of Brain Gym

No.	Variable	Pretest		Post-test	
		F	%	F	%
1	Dementia				
	Good	0	0	11	73.3
	Fair	0	0	4	26.7
	Poor	15	100	0	0
	Total	15	100	15	100
2	Depression				
	Normal	0	0	9	60
	Mild	10	66.7	6	40
	Moderate	5	33.3	0	0
	Total	15	100	15	100

Based on **Table 2** respondents with dementia before brain gym had a level of dementia (MMSE <21) of 15 respondents (100%) and respondents with depression in the mild category of 10 respondents (66.7%), the medium category was 5 respondents (33.3%).

And after doing brain gym the majority of respondents with dementia had dementia leveled in the good category (MMSE 27-30) as many as 11 respondents (73.3%) and respondents with the majority of depression in the Normal category (SDG category score 0-4) 9 respondents (60%).

The brain gym effect on decreasing dementia levels and depression in the elderly

Respondents in this study were given brain gym intervention, each respondent was given a pre-test and post-test to measure the decrease level of dementia and depression. It is necessary to do a t test, and the requirement to do this test is the data must be normally distributed. To test it using the Shapiro-Wilk test because the sample (n <50), is said to be normal if (p value > 0.05) with a 95% confidence level.

Table 3. Data Normality Test Results with Shapiro-Wilk Dementia and Depression Levels of respondents pre-test and post test Brain Gym

Domain	Df	Sig
Pre Test Dementia	15	0,000 (TN)
Pre Test Depression	15	0,000 (TN)
Domain	Df	Sig

Post Test Dementia	15	0,000 (TN)
Post Test Depression	15	0,000 (TN)

NN: Non Normal, N: Normal

Based on **Table 3** the normality test using the Shapiro Wilk Test (n <50) showed that the level of dementia and depression before brain gym is a data which is not normally distributed (p-value = 0,000 <0.05) so it is analyzed using the Willcoxon test. Likewise, the normality test for the level of dementia and depression after brain gym used Shapiro.

The Wilk Test (n <50) shows the results that the data are not normally distributed (p = 0.00 <0.05), and analyzed using the Willcoxon test to see differences in the level of dementia and depression of pre-test and post-test of the brain gym.

Table 4. Differences in the level of Dementia and Depression in respondents Pre-test and Post Test of Brain Gym

Variable		Mean	SD	Score		p-value
				Min	Max	
Dementia	Pre	3.00	0.000	3	3	0.000
	Post	1.27	0.458	1	2	
Depression	Pre	2.23	0.488	2	3	0.006
	Post	1.40	0.507	1	2	

Based on **Table 4** the description of respondents with dementia pre-test of brain gym intervention average value of 3.00 with a value of 3 (MMSE <21), and post-test of brain gym intervention based on the Wilcoxon test was p = 0,000, and the average value was 1.27 with a minimum value of 1 (MMSE: 27-31) and a maximum of 2 (MMSE: 22-26).

While the description of the mean depression pre-test of brain gym is an average of 2.23 with a minimum value of 2 (SDG score 5-8) and a maximum value of 3 (SDG score 9-11), and post-test of brain gym intervention is an average value of 1.40 with a minimum value of 1 (SDG score 0-4) and a maximum of 2 (SDG score 5-8), based on the Wilcoxon test p-value = 0.006 <0.05.

The results showed that the average score of respondents with Dementia pre test of brain gym intervention was an average of 3.00 and post test of brain gym was an average of 1.27 with a value (p value = 0,000 <0.05), Therefore, the results showed the influence of brain gym on decreasing the level of dementia in the elderly.

There is a significant difference between pre-test and post-test which means there is a significant decrease in the level of dementia between pre test and post test of Brain Gym intervention, as well as Sangundo and Sugiranresearch. Sangundo and Sugiran(2009) stated that there is a significant influence of brain gymnastics and respondents who followed brain gym experienced a significant increase in cognitive function [22]. Furthermore, according to Andani's research, (2016) brain gym has incidence on dementia in the elderly at the Tresna Werdha Yogyakarta Social Service Center [23].

While respondents with depression pre test of brain gym intervention the average value was 2.23 and post test intervention the average value was 1.40 with a value (p value = $0.006 < 0.05$), showed that the influence of brain gym on decreasing the level of depression in the elderly.

Brain Gym is a therapy that is useful for releasing stress, clears the mind to improve memory, facilitates learning activities and make adjustments to tension, challenges and life guidance so that regular brain gym therapy will reduce the level of depression in the elderly [24].

Depressed elderly are often characterized by moody behavior, negative thoughts, lack of enthusiasm, lack of concentration, and no daily activities. With brain gym therapy, it is expected that depressed elderly who have negative thoughts can be treated and those who behave unenthusiastically, lack of concentration, do not do daily activities can be motivated to be active in meeting their physical and psychosocial needs.

Brain gym can balance each part of the brain, attract the level of brain concentration and also as a way for blocked parts of the brain in order to function optimally. Brain gymnastics opens parts of the brain that were previously closed or stunted so that learning or activities can take place using the whole brain. As a result, emotional stress is reduced and the mind clearer. Relations between humans, and the atmosphere of learning and working is more relaxed and happy. A clear mind, reduced emotional stress, feeling relaxed and happy can reduce the level of dementia and depression in the elderly.

In this research, brain gym was chosen based on the ability of respondents aged 60-74 years, not too heavy and accompanied by lively music but fun so that the elderly feel enthusiasm for exercising and lose depression.

Conclusion

The results showed that there are differences in the average value of pre-test and post-test of brain gym interventions in respondents with dementia and depression. The description of respondents with dementia pre-test Brain Gym intervention was an average value of 3.00 with a value (MMSE < 21), and post-test of the Brain Gym intervention was, the average value of 1.27 with a minimum value (MMSE: 27-31) and maximum (MMSE: 22-26), and Wilcoxon test results p value = $0,000 < 0.05$.

While the description of the mean depression pre-test of Brain Gym is an average of 2.23 with a minimum value (SDG score 5-8) and maximum value (SDG score 9-11), and post-test of Brain Gym is an average value 1.40 with a minimum value (SDG score 0-4) and maximum (SDG score 5-8), and Wilcoxon test results were p -value = $0.006 < 0.05$, so it can be concluded that the results of influence between Brain Gym to decrease the level of Dementia and decrease the level of Depression in the elderly in the work area of the Mulyorejo Public Health Center. Deli Serdang 2019.

It is expected that this Brain Gym can be carried out routinely without researchers both at home and simultaneously carried

out during routine activities at the elderly posyandu (*integrated health care center*). *Posyandu* is the construction of *pusat pelayanan kesehatan* the authors translate it for English *integrated health care center*, the authors should be familiar with the terms as proposed by [25, 26] to find its accurate meaning in the target language.

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