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ORIGINAL RESEARCH

THE IMPROVEMENT OF COGNITIVE FUNCTION AND DECREASE THE LEVEL OF STRESS IN THE ELDERLY WITH BRAIN GYM

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ABSTRACT

The decline in cognitive function in the elderly, which is part of the aging process can result in long-term memory problems and information processes, so it is often regarded as a stressor that causes stress and perceived as an adverse threat. Brain gym can improve memory, decreased emotional stress and the clearer mind. The aim of the study analyzed the effectiveness of brain gym in improving cognitive function and decreased the level of stress of elderly. Pre-experimental study of one group pretest-posttest design with 35 samples older adult age 60 years till 75 years old selected by simple random sampling. The frequency of Brain Gym exercised twice a week with duration of every 15 minutes and done in four weeks. Measurement of stress level using DASS, during Cognitive function with MMSE. Data analyzed using Wilcoxon signed rank test. The results showed improvement of cognitive function in elderly and decreased stress level after brain gym ($p = 0.001$ and $p = 0.009$ at $\alpha = 0.05$). Brain gym had a significant effect on improving cognitive function of elderly and reduced the level of stress in the elderly face a life stressor.

Keywords

The improvement of cognitive function and decrease the level of stress in the elderly with brain gym

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INTRODUCTION

The aging process can cause many changes in the elderly, one of which is the nervous system decreases the function of the brain and the decline of cognitive function (Trouillet, 2011). Decreased cognitive abilities such as forgetfulness, the decline in time orientation, place, space, and not easy to accept new ideas. This decrease can lead to problems such as long-term memory in revealing stories or events that are not so interesting and new information (Morano, 2003).

In the elderly, the weight of the brain decreases 10-20%, although, in the absence of neurodegenerative disease, there is a change in the structure of the human brain. The impact of pathological changes in elderly cerebrovascular disease is Alzheimer's dementia, which occurs about 10-15% in older adults over 65 years and to date an estimated ± 30 million people worldwide experience dementia for various reasons (Lumbantobing, 2006).

Changes resulting from the aging process are often regarded as stressors that cause stress and are perceived as an adverse threat. Problems that often cause stress in the elderly is post power syndrome, feelings of disappointment because no longer respected as before, less attention by children and grandchildren, feel lonely and solitude. In retirement, the elderly lost his busyness and position. Coinciding with that the children are married and leave home, while the body began to weak and not allow travel, so often cause stress (Azizah, 2011). Holmes and Rahe (1967) in Hawari (1999), suggested that stress in elderly retirement was ranked the 10th of 43 life events that caused stress based on Social Readjustment Rating Scale (SRRS).

There are several ways in improving cognitive function, one with a brain gym because it can release stress, clear the mind, and improve memory (Muhammad, 2013). Brain gym is a series of simple motion exercises to facilitate learning activities and adjustments to everyday demands. Brain gym attempts to activate the left and right brain optimally. Brain gymnastic exercise is made to stimulate the left brain and right brain (dimension of laterality), relieve or execute the back of the brain and the front of the brain (focusing dimension), stimulates the emotional or emotional system (central dimension) the brain can be done without special time. (Yanuarita, 2012: Nurdin, 2015). Brain gymnastics can be performed by all ages, ranging from infants to elderly (Muhammad, 2013).

When a person is afraid, nervous, or stressed then reflexively the energy is pulled into the back of the brain so that the front of the brain has a lack of energy, consequently, the answer that was ready, suddenly forgotten or not able to be answered perfectly. The frontal brain barrier is passive and the ability to pay less attention (Muhammad, 2013). Exercises in brain gym according to research conducted by Ayinosa (2009) can provide a positive effect on improving the concentration, attention, alertness, and ability of brain functions to do planning, response and decision making. Many people who find it helpful with a brain gym, such as relieving stress, increasing the concentration of learning to clear the mind, and improve memory (Nuryana, 2010).

The aim of this study proves the influence of brain gym in improving cognitive function and decrease stress level of elderly.

MATERIALS AND METHODS

1. Design and Participants

The research design was pre-experimental, with a one-group pretest-posttest design. The multistage random sampling selected to obtain the sample of 35 elderly from 18 villages in Mojokerto East Java from March 2016 till May 2016. The inclusion criteria were older adult age 60 years till 75 years old and married.

2. Research tools

The variables depend on the cognitive function measured using the MMSE Status (Mini-Mental State Examination) of Folstein MF (Burn Et.al, 1999), which measures cognitive function in 6 domains, namely orientation, registration, attention, recall, language and imitate. Scores for each domain are not the same. Domain orientation scores 10, registration 3, attention 5, recall 3, language 8 and mimic 1. The reliability of the checklist was 0.69 (95% confidence interval).

The stress levels were measured using the DASS 42 instrument from Lovibond and Lovibond 1995 in Burn. Et.al. (1999). DASS 42 is a set of subjective scales established to measure the negative emotional states of depression, anxiety, and stress. Consisting of 42 item statements covering three sub-variables namely physical, emotional, and behavioral. For inter-rater reliability was 0.54 with confidence interval 95%. The Brain gym guide consists of 9 steps from Dennison (2008), which includes the activation of lateral dimensions, focusing, and dimensioning dimensions.

3. Statistical analysis

The statistical test using the Wilcoxon Signed Rank compares two groups with the same ordinal data scale. The assumptions used are normally distributed data, the distribution of homogeneous data and samples taken at random. The probability value $p < 0.05$.

4. Ethical considerations

All participants agreed to sign an informed consent form. This study has obtained permission from local authorities and ethical approval from health research of ethics committee Faculty of Public Health Airlangga University Indonesia.

RESULTS

The prevalence of definitive cognitive impairment in the elderly before brain gym was (68%) in women and (32%) in men. The higher level of stress was 71% in women and 29% in men. Individuals with widows/majority who have the definitive cognitive impairment (85%), and those with the most severe stress (45%).

Table 1 shows that almost half of respondents before being given a brain gym experienced a very heavy stress level of 11 respondents (32%) after a brain gym showed that most respondents experienced normal stress level of 22 respondents (63%). The output in the value can be z -3,825, with ($p = 0.009$) at (α 0,05) which means that brain gym effectively decreases stress level of elderly.

Table 1
The influence brain gym to reduce level of stress

No	Level of Stress	Before		After	
		F	%	F	%
1	Normal	6	16%	22	63%
2	Lower Stress	4	11%	7	21%
3	Moderate Stress	6	16%	6	16%
4	High Stress	8	25%	0	0%
5	Very High Stress	11	32%	0	0%
	Total	35	100%	35	100%
	Z			-3.825[a]	
	Asymp. Sig. (2-tailed)			.009	
	α			0.05	

Table 1 shows that almost half of respondents before being given a brain gym experience probable cognitive impairment as much as 21 respondents (58%) after a brain gym showed a decline in the number of elderly probable cognitive impairment with as many as 16 respondents (46%). The output at the value can be z -3,915. With (p = 0.001) at (α 0,05) which means that brain gym effectively improves cognitive function of elderly.

Table 2
The influence brain gym to increase cognitive function

No	Cognitive function	Before		After	
		F	%	F	%
1	Normal	8	27%	14	40%
2	Probable	21	58%	16	46%
3	Definitive	6	15%	5	14%
	Total	35	100%	35	100%
	Z			-3.915	
	Asymp. Sig. (2-tailed)			.001	
	α			0.05	

The differences in results before and after the Brain Gym on stress and age cognitive function (see Table 1 and 2) showed that brain gyms were more significant in reducing stress levels than improving cognitive function of older adults (p = 0.009 and p = 0.001).

DISCUSSION

Brain gym has a significant effect on the improvement of cognitive function of elderly. This is in line with Dennison (2008), that exercise in the brain gym can provide to stimulating the brain. It can release stress, increase learning concentration, clear the mind, improve memory, improve cognitive abilities, such as alertness, concentration, and speed in the learning process, as well as memory, problem-solving, or creativity.

Brain gym activates the right and left brain balance by providing an improved stimulus to the fibers in the corpus callosum connecting the second cortical area of the brain hemisphere including the hippocampus and amygdala, thus facilitating the flow of electromagnetic energy throughout the body (Dennison and Dennison, 2009). Brain gyms align ability activity and thinking at the same time improves balance and harmonization between emotional control and logic, optimizes the function of the senses, maintains flexibility and balance of the body, enhances memory, improves auditory and visual acuity, reduces reading errors, memory and comprehensive ability in groups the use of language, to be able to improve the response to visual stimuli (Muhammad, 2013).

Brain gym has a significant effect to reduce the level of stress in the face of life stressor. Mild exercise movements are done in brain exercises, such as through the hands and feet that can provide stimulation to the brain. The stimulation can release stress, improve concentration learn, clear the mind, improve

memory, improve cognitive abilities, such as alertness, concentration, and speed in the learning process, and memory, problem-solving, or creativity (Purwanto et al., 2009).

Brain gyms are more effective at lowering stress levels than older cognitive function improvements that require longer and more intense time to improve concentration and elderly memory. It is in line with Dennison and Dennison (2009) that brain gyms movement increases energy and supports a positive attitude (dimension concentration) activates the neocortex and thus refocuses electrical energy to reasonable thinking centers. This activates the parasympathetic function and reduces adrenaline release by increase the electrical tension of nerve membranes, minds, and actions are coordinated again.

CONCLUSION

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. Brain gyms enable right and left brain balance by aligning the ability of activity and thinking at the same time improving balance and harmonization between emotional control and logic. Brain gyms can be done by the elderly at any time and will be more effective when done with optimal focusing and concentration with proper scheduling and training.

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References

Azizah, Lilik. 2011. *Keperawatan Lanjut Usia*, Graha Ilmu Publisher, Yogyakarta

Burns A, Lawlor B, Craig S. 1999. *Assessment Scales in Old Age Psychiatry*. Martin Dunitz Ltd. London; p.56-57.

Dennison, E Paul. 2008. *Brain Gym and Me: Brain Gym dan Aku: Merasakan Kembali Kenikmatan.* Jakarta: PT Gramedia Widiasarana Indonesia.

Dennison, E Paul and Gail E Dennison. 2009. *Brain Gym Senam Otak,* PT Gramedia: Jakarta.

Hawari, Dadang. 1996. *Al-Qur'an Ilmu Kedokteran Jiwa dan Kesehatan Jiwa*. PT. Dana Bhakti Prima Yasa. Jakarta, Hlm 46

Lumbantobing. 2006. *Kecerdasan pada Usia Lanjut dan Dementia.* Balai Penerbit FKUI. Jakarta. 7-15

Morano, Carmen Louis. 2003. *Appraisal and coping: Moderators or mediators of stress in Alzheimer's disease caregivers*?, Social Work Research, Jun ; 27 (2) : p. 116

Muhammad, As'adi. 2013. *Tutorial Senam Otak untuk Umum.* Yogyakarta: FlashBooks.

Nurdin. 2015. *Pengaruh Senam Otak Terhadap Stres pada Santri Madrasah Mu'alimin Yogyakarta.* Skripsi: STIKES 'Aisyiyah Yogyakarta.

Nuryana, Atika, Setiyo Purwanto. 2010. *Efektivitas Brain Gym dalam Meningkatkan Konsentrasi Belajar pada Anak.* Jurnal Ilmiah Berkala Psikologi Vol. 12, No. 1: Universitas Mummadiyah Surakarta.

Purwanto, Setiyo, Rahayu. 2009. *Manfaat Senam Otak (Brain Gym) dalam Mengatasi Kecemasan dan Stres Pada Anak Sekolah.* Jurnal Kesehatan, ISSN 1979-7621, VOL. 2, NO. 1: Universitas Muhammadiyah Surakarta.

Trouillet V, Launay M. 2011. *Impact of Age, and Cognitive and coping resources on coping*, Canadian Journal on Aging; 30 (4): p. 541-550.