

# The Effect of Resistance Exercise Training Addition

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## ABSTRACT

**Background:** Growing old is one factor affecting the decline in cognitive function caused by aging in the elderly. As we get older, there will be physiological changes in somebody's systems, especially in the nervous system. Changes in neurotoxic or neuro techniques will result in decreased cognitive function. Several risk factors also cause decreased mental function, such as gender, obesity, impaired thyroid function, diabetes mellitus, cardiac arrhythmia, and trauma. It is associated with reduced productivity and the quality of life of the elderly itself.

**Aim:** The research objective is to see the effects of resistance exercise training on elderly cognitive function.

**Method:** This research used a quantitative approach with experimental design, pre, and post-test group design. The group received four times a week brain vitality training and additional resistance exercise training three times a week for eight weeks. Measurement of cognitive function was done with Mini-Mental Score Examination (MMSE).

**Results:** The result paired sample t-test result  $p = 0.19$ .

**Conclusion:** There is an effect of resistance exercise training on brain vitality exercises on keeping cognitive function in the elderly.

**Keywords:** Cognitive Function, Brain Vitality Gymnastics, Resistance Exercise Training

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## INTRODUCTION

Aging is closely related to the decline in cognitive function in older adults across the world; even in advanced countries such as the US, more than 16 million people in the United States are affected by their cognitive function decline [1]. Population projections result in 2010-2035. According to data and updates from Indonesia's health ministry, Indonesia will enter a period of elderly (aging), where 10% of the population will be aged 60 years old and over in 2020. The distribution of the elderly population according to the province, the highest percentage of elderly is DI Yogyakarta (13.4%), and the lowest is Papua (2.8%) [2].

Based on the theory, dementia is quite common in older adults over 65 years old and 85 years old. In cases of dementia, about 10-20% is reversible or treatable. In Indonesia, the prevalence of dementia in older adults 65 years old is 5% of the elderly population. This prevalence increases to 20% in older adults 85 years old and over [3].

One of the significant health problems among the elderly is the decline of cognitive function. The handling of this problem begins as early as possible, such as prevention or preservation of cognitive function in the elderly, either using disease prevention or by social means, as it is considered that activities involving the role of thinking can slow down the process of declining cognitive function [4].

In this case, physiotherapy has the power and responsibility to increase health and vitality in the elderly by doing promotion, preventive, curative, and rehabilitation. One of the job disk physiotherapy to keep cognitive function in the elderly is to avoid dementia and Alzheimer where the patient always increases every year.

Brain vitalization gymnastics is an exercise that has a goal to keep and save brain health with a moving body. The basic principle of brain vitalization gymnastic is to keep the routine work, health, and prevent from senility. One of some methods to maintain brain vitality was with brain gymnastics, brain vitalization gymnastics [5]. Physical

activity and exercise have shown a positive effect on cognition function in aging [6].

Therefore, many studies provide positive suggestions for the positive effects of physical activity and structured activity on cognitive function by many relevant findings to extensively positive mental function changes. In some cases, the combination of different forms of exercise in some interventions that train endurance, strength, balance/coordination, and flexibility can improve the cognitive domain of elderly healthy such as aerobic activity and anaerobic, show benefits for brain health and cognitive function.

Continuous physical exercise has an advantage for the elderly, increasing brain plasticity and growth and cell living in the brain. The results showed that the brain figure of individuals who perform the physical exercise with moderate intensity could increase brain volume in the most critical parts such as memory, knowledge, and planning, compared to individuals who are not active [7]. Physical exercise improves connections between parts of the brain and has a better cognitive function. This case gives the impression that many brain cells and interconnectedness help the brain function very effectively (Farrow et al., 2013). With this, the researcher takes the intervention of additional resistance exercise training on brain vitality exercises was chosen because it proved useful in improving cognitive function in the elderly [8].

## METHOD

Research of resistance exercise training also affects gymnastics' vitalization of the brain to the cognitive function of the elderly.

We are using a quantitative approach. The method used in this study is experimental. The research design was pre and post-test [9] of two group designs by comparing between treatment group of one brain vitalization gymnastics and group of two brain vitalization gymnastics with Resistance exercise training.

The research subjects used in this study are older adults aged 60 years and above and taken by using purposive sampling technique; this study the effect of the addition of resistance exercise training on brain vitalization gymnastics toward the cognitive function of elderly using one group, got treatment brain vitality exercises with the addition of resistance exercise training. Both groups measured cognitive function by using the research instrument in the Mini-Mental Stage Examination (MMSE) [10]. The group received two treatments, brain vitality training four times a week and resistance exercise training for eight weeks three times a week. Independent variables in the study were brain vitalization exercises and resistance exercise training. The dependent variable of this study is the improvement of cognitive function in the elderly.

Ethics in research pay attention to the approval of the respondents (informed consent), no name (anonymity), the confidentiality of respondents (confidentiality). To know the significant effect of the addition of resistance exercise training on brain vitality exercises toward cognitive function increasing in elderly before and after training development of vitalization gymnastics of the brain and elderly gymnastics then tested data normality using Shapiro-Wilk and homogeneity test with Levene's test after normal distributed and homogeneity then analyze the hypothesis test [11]. Hypothesis testing using paired sample t-test.

**RESULTS**

The research has been conducted on the elderly in UPT Rumah Pelayanan Sosial Lanjut Usia Terlantar Budhi Dharma, Ponggalan UH VIII / 203, Giwangan, Umbulharjo, Yogyakarta, Special Region of Yogyakarta. For eight weeks using experimental research design. The elderly population at this study site was 57 older adults living there: 20 men and 37 women over 60 years old. A researcher found the elderly are still healthy and independent. There are 42 people, but even in self-condition and always be in the cognitive review, there are only 29 people. At the preliminary study, they also conducted sample measurements using MMSE obtained 24 samples included in the inclusion criteria. At the end of the study, the number of pieces reduced because of the exclusion criteria appearing during the survey, then fall six people. The sample recorded to 18 people samples that occur in women and men. The research sample used 16 people, sampling technique with purposive sampling inclusion groups, then the group got vitalization gymnastics and resistance exercise training, in group consist of 8 people sample.

Tabel 1. Intervention

Subject	Treatment
A group	Brain vitalization gymnastic and resistance exercise training

Tabel 2. Respondent's Distribution Based on Sex

Sex	Treatment group	
	Numbers	Percentage (%)
Male	4	50.00
Female	4	50.00
Numbers	8	100

In this study, the researcher used a statistical test to test the hypothesis. The statistical tests used the Paired T-test. The test is a parametric test that the normality test becomes the requirement.

Tabel 3. Normality Test

	Shapiro-Wilk		
	Statistic	df	Sig.
PreSR	.944	8	.646
PostSR	.826	8	.054

Tabel 4. Paired T-Test

	Mean±SD	P
Pre	27,5±1,77	0,019
Post	28,7±0,88	



Figure 1: Brain vitalization Gymnastic



Figure 2: Preacher Curls without weight

**DISCUSSION**

There was an effect of the resistance exercise training addition on brain vitality exercises to keep the cognitive function of elderly with paired sample t-test  $p = 0,019$  ( $p < 0,05$ ). According to Heijnen S (2015), a mechanism with combination exercise results in neural health, increasing blood vascularisation, neuroendocrine respon, endocannabinoid, neurotransmitter release, and structure changed in the Central Nervous system.

**CONCLUSION**

There is an effect of resistance exercise training on brain vitality exercises on keeping cognitive function in the elderly. This research can be used as a reference for further research on keeping cognitive function in the elderly by considering factors influencing the respondent's mood and its handling and precondition before and after the intervention.

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