THE EFFECT OF BRAIN GYM ON THE LEVEL OF INDEPENDENCE OF THE ELDERLY

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Original Research Article

THE EFFECT OF BRAIN GYM ON THE LEVEL OF INDEPENDENCE OF THE ELDERLY

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Abstract

Background: The height ratio dependence elderly in Indonesia is very worrying. The ratio dependence elderly in Indonesia are increasing from 14.02% in 2017 to 16.76% in 2021. East Java including the top 5 province with dependence elderly and occupying ranking to 3 after Central Java province.
Objectives: To know the effect *of* brain gym on level independence elderly.
Methods: This was pre-experiment with use approach one group pre-post test design. Population in the study is all over elderly people in the village Ringinsari, District Kandat Kediri Regency. Technique of taking sample done with technique Consecutive Sampling. Data analysis was carried out through two stages. Stage First that is analyzing pre and post independence data elderly using the pre post test design test. Stage second is analyze the effect of brain gym on level independence elderly using the Wilcoxon test.
Results: Research results show that there is change in level of independence before and after given Brain Gym intervention. The results of data analysis using the Wilcoxon test (level of 95% confidence interval is p= 0.000<0.05) which means there is the effect of brain gym to level independence elderly in the village Ringinsari, District Kandat Kediri
Conclusion: Brain gym influential to level independence in the elderly.

Keywords: Brain Gym, Elderly, Level of Independence Elderly

INTRODUCTION

Elderly is a process of disappearance in a way slowly ability network for repair self or replace and maintain function normally so that No can endure from infection and repair the damage suffered (Nugroho, 2012).

Our society moment this still look at people with carry on age as a lesser person productive, less interesting, less energetic, easy forget, maybe not enough worth compared to with those who still in prime condition. Carry on age with all limitations and experiencing decline aspect biological social and psychology certain will keep going felt. With increase age also causes change the function of the organ that will cause impact to direction change independence elderly in do activity of daily living. Problem description daily living

activities elderly in Indonesia, namely with the disturbance *daily* living activities with various type factors and causes can cause problem like decline function cognitive decline in the elderly. function cognitive in the elderly become reason the biggest inability elderly in do activity everyday (Activity Daily Living), so cause elderly experience dependence towards others.

Globally the numbers life elderly in the world will Keep going increased. The proportion resident elderly in the world in 2019 reached 13.4 % in 2050 it is estimated increase to 25.3% and in 20100 it is estimated to 35.1% of the total population (WHO, 2019). Such as as is the case in the world, in 2019 Indonesia also experienced improvement amount elderly to 27.5 million or 10.3% and 57.0 million soul or 17.9% in 2045 (Ministry of Health, 2019). The ratio dependence elderly in Indonesia is increasing from 14.02% in 2017 to 16.76 % in 2021. Percentage the to mean that every 100 people aged productive must look after at least 17 elderly people (BPS, 2021). Province with ratio dependence elderly the 5th highest in Indonesia, namely provinces of North Sulawesi, Central Java, East Java, Yogyakarta and Bali (BPS, 2021). East Java occupies ranked 3rd after Central Java province.

Independence is ability individual for act up in demand in accordance her wishes (Marlita, 2015). Independence elderly in do activity daily or Activity Daily Living (ADL) is defined as independence someone in do activity everyday things done by humans in a way independent, routine and universal (Roehadi et al., 2016). Independence elderly in ADL is defined as independence somebody in do activities and functions life daily activities carried out by humans good routinely and universally (Sari, 2013). Independence is attitude individual obtained in a way cumulative in development where individual will keep going study for behave independent in face various the situation in the environment, so that individual capable think and act myself. With independence somebody can choose road

his life for develop become better (Husain, 2013). Independence elderly in ADL is defined as independence somebody in do activities and functions life everyday things done by humans with regular (Ediawati, 2013). The decline independence elderly in do Daily Living Activities caused by stiff joints, limited movement, conditions No stable when walking, balance ugly body, disorder circulation blood, and decrease function sight, hearing, and touch. The occurrence of decline function ability physique cause fulfillment need activity physique daily daily living activity continued age become disturbed.

One of method for practice brain to reduce risk dependence in do activity a day in the elderly is with brain gym. Brain gym exercises are a series movement simple body for stimulate brain left and right, lightening and relaxing part front brain and back brain, stimulating related systems with feeling/ emotional that is brain middle (limbic) and brain big (Yuliati & Hidayah, 2017). Therefore, that important elderly for guard function cognitive because will impact prevention decline independence elderly in Activity Daily Living (ADL). Although elderly in a way natural experience decline and decline physical, but no close possibility elderly can do activities and fulfillment need daily in a way independent. Availability helps throughout time at home and institutions service health functioning protect need elderly for still stay in his house and maintain his independence during maybe. Research This aiming for know the effect of brain gym on level independence elderly.

Objective(s): The aims of this study to know the effect of brain gym on level independence elderly.

METHODS

Study Design

This study was pre experiment with use approach one group pretest-posttest design.

Setting

This study was conducted at Posyandu Lansia in the village Ringinsari, District Kandat Kediri

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Research Subject

Population in the study is all over elderly people in the village Ringinsari, District Kandat Kediri. Technique of taking sample done with technique consecutive sampling namely the sampling technique where all subjects who come and meet criteria election entered in study until amount required subjects fulfilled.

Instruments

The process of data collection and retrieval during study obtained with do interviews and observations. Instruments used for assessing the level of independence elderly is Barthel Index. Based on Agung Iskandar's theory (2010) Barthel Index is a functional assessment instrument measure independence functional in matter maintenance self and mobility as well as can also be used as criteria in evaluate ability functional for patients who experience disturbance balance using 10 indicators, namely:

Table 1. Level of Independence Elderly Based on Barthel Index

No	Activities	Mark	Information
1	How your ability to control your bowel movements	0	Incontinence
		1	Sometimes Incontinence
		2	Continence regular
2	How your ability to control urination	0	Incontinence
		1	Sometimes Incontinence
		2	Continence regular
3	How your ability to clean self (face cloth, comb) hair, brush tooth)	0	Need help others
		1	Independent
4	How toilet use (going to the toilet) to/from the toilet, taking off/	0	Depends help others
		1	Need help on some activity,
	putting on pants, wiping, flushing) Sir/Madam?		but a number of activities still can do alone
		2	Independent
5	How ability eat sir/madam	0	Unable
		1	Need help others
		2	Independent
6	How your ability to move place	0	Unable
		1	Need help for can sit
		2	assistance of 2 people
		3	Independent
7	How your ability in mobilization / walking	0	Unable
		1	Can walk with chair wheel
		2	Walk with help from others
		3	Independent (sometimes) assisted
8	How your ability in get dressed?	0	Depends help others
		1	Some are helped
		2	Independent
9	How your ability to go up and down ladder?	0	Unable
		1	Need help others
		2	Independent
10	How your ability in clean yourself (bathing)?	0	Depends help others
		1	Independent

Interpretation:
Independent : 20
Dependence Light : 12-19
Moderate Dependence: 9-11
Weight Dependency : 5-8
Total Dependency : 0-4

Intervention

Exercise Brain Gym taught to Respondent based on Standard Operational Procedure. Brain gym given as much as 4 times in 1 month with duration time each meeting 15–20 minute. Exercise brain implemented in a way a group of 30 people with led researcher and accompanied by staff. Post-test done after 1 month for know difference in level of independence elderly before and after given brain gym intervention in groups treatment.

Data that has been obtained tested

based on the scale of the data, because research data scale this is the nominal used category so analysis statistics used is a paired t test with assumption that the data is normally distributed. If the data is not normally distributed then done analysis statistics nonparametric using the Wilcoxon test (Sugiyono, 2011) with level significance α ≤ 0.05. Data processing uses SPSS software assistance version 22.0 then taking decision reception hypothesis study based on the level significance (ρ value), namely: a). If ρ≥0.05 then H0 is accepted, meaning No There is the effect of brain gymnastics to increased level of independence elderly. b). If ρ≤0.05 then H0 is rejected, meaning There is the effect of brain gymnastics to level independence elderly (Uyanto, 2010).

Data Analysis

Data analysis was performed through two stages. Stage First that is analyzing pre and post independence data elderly using the pre post test design test. Stage second is analyze the effect *of* brain gym on level independence elderly using the Wilcoxon test.

Ethical Consideration

In this research, an ethical feasibility test was carried out.

RESULTS

Based on results study regarding demographic data elderly based on age elderly at Posyandu elderly people of Ringinsari Village Subdistrict Kandat Kediri was obtained results as following;

Table 2. Distribution Demographic Data Frequency Elderly Based on Age

Age	(f)	(%)
60 – 70 years	26	86.7
≥ 70 years	4	13.3
Total	**30**	**100**

From table 2 above show that from 30 respondents based on age, majority respondents in the range age 60-70 years as many as 26 people (86.7%), and a minority elderly in the range age ≥ 70 years as many as 4 people (13.3%).

Table 3. Distribution Demographic Data Frequency Elderly Based on Gender

Gender	(f)	(%)
Woman	25	83
Man	5	17
Total	**30**	**100**

From table 3 above show that from 30 respondents based on type gender, majority Respondent various Female gender as many as 25 people (83%), and a minority elderly in the range age ≥ 70 years as many as 5 people (17%).

Table 3. Distribution Demographic Data Frequency Elderly Based on Education Level

Level of education	(f)	(%)
Elementary school	18	60
No school	12	40
Total	**30**	**100**

From table 4 above show that from 30 respondents Based on education level, the majority respondent educated elementary school as many as 18 people (60%), and some elderly people who do not go to school as many as 12 people (40%).

Table 5. Distribution frequency Respondents Based on Level of Independence Elderly Before Intervention

Level Of Independence Of The Elderly	(f)	(%)
Light Dependence	28	93.30%
Medium Dependence	0	
Heavy Dependence	0	
Total Dependence	0	
Independent	2	6.70%
Total	**30**	**100%**

From table 5 above show that distribution level independence elderly before done brain gymnastics intervention (*pre-test*) in the group treatment from the total respondents (30 elderly people) it was found that majority that is 28 respondents (93.30%) have level dependence light, and 2 respondents (6.70%) with level independence category independent.

Table 6. Distribution frequency Respondents based on Level of Independence elderly after given brain gymnastics intervention at Posyandu Elderly People of Ringinsari Village Subdistrict Kandat Kediri in 2024

Level Of Independence Of The Elderly	(f)	(%)
Light Dependence	17	56.7 %
Medium Dependence	0	
Heavy Dependence	0	
Total Dependence	0	
Independent	13	43.3 %
Total	**30**	**100%**

From table 6 show that distribution Level of independence elderly after done brain gymnastics intervention (posttest) from the total respondents (30 elderly) data obtained was as much as 17 respondents (56.7%) have level dependence light, and 13 respondents (43.3%) with results category independent.

Table 8 Analysis Bivariate distribution level independence elderly before and after given brain gym intervention at Posyandu Elderly People of Ringinsari Village Subdistrict Kandat Kediri Regency in 2024

Level of Independence	N	Median	Min-Max	ρ	Z
Pre	30	17.07	13-20	0,000	4,594
Post	30	18.73	16-20		
Difference		1.66			

In this research, analysis bivariate done to understand the effect of brain gymnastics to level independence elderly in Ringinsari Village Subdistrict Kandat Kediri.

Based on table 8 distribution level independence elderly can seen that from 30 respondents before given intervention own average with a total of 17.07 with mark the lowest on the pre-test measurement was 13 and value highest is 20. After done intervention, from 30 respondents own average with total 18.73 with mark the lowest score in the post-test measurement was 16 and the value highest is 20, so difference level independence elderly between before and after done brain gymnastics intervention is 1.66.

From the results of statistical tests with using the Wilcoxon test obtained mark ρ=0.000 and the value α=0.05 which means mark ρ≤ α. It is also obtained mean value before done brain gymnastics intervention namely 17.07 and after done brain gym intervention which is 18.73 with difference of 1.66. From both statistical arguments concluded that existence the effect of brain gymnastics to level independence elderly.

DISCUSSION
Level of Independence Elderly Before Do Brain Gym

Elderly experience decline cell due to the aging process which resulted in organ weakness, decline physical, and the emergence of disease degenerative. On generally after people enter old age so He will experience decline function cognitive and psychomotor. Based on demographic data results research, part big elderly have a primary school education level.

Elderly of course tend experience decline function memory, but Lesmana (2006) said that study show treasury more words good for people aged 70 years than 30 years. Age restrictions also matter from level of independence elderly. In the study this from 30 respondents obtained majority aged between 60-70 years and ≥ 70

years there were 4 respondents. The results showed that part big respondents are at in category dependence light, can seen from ability respondent still capable do activity daily only with A little help from other people such as bathing, eating, defecating and caring for self alone, while respondents who entered in category independent There are 2 respondents. Independent it means Respondent No need help others to do activity everyday. According to Riza & Desreza's research (2018) in Lambhuk Village Subdistrict Ulee Lheue City of Banda Aceh was obtained elderly range age 60-74 years in category independent as much as 50% and weight dependency of 28.6%. This is due to part big Respondents is at in condition good health. With healthy condition Respondent can do activity What just without request help from other people, or as little as Possible depends to others.

Brain big If split become brain left and right and seen from on looks separated by deep, elongated indentations called fissure *longitudinalis*. On base curve there is a bunch fiber that connect second hemisphere brain and called with *corpus callosum* and in nickname as a " bridge " gold or *golden bridge*". Brain gym can reach *brain exercise* through movement *crossing the midline*. Crossed body, head and eye movements line middle body can increase potential brain (Sidiarto, 2004).

Level of Independence after Do Brain Gymnastics

Based on post test results level independence Elderly obtained part big respondents own level independence light as many as 17 elderly (57%) and 13 elderly (43%) have level independence category independent. There are Increased independence level results Elderly with category Independent from 2 elderly (7%) to 13 elderly (43%).

This matter in accordance with results research conducted Pratama (2017), where found category independence in the elderly range aged 60-74 years in Social Institutions Tresna Minaula Kendari by 60%. This is because of elderly Still capable do activity everyday. Independence in do activity life daily is freedom for act, no depend on others for nurse [21]lf Alone and also do activity everyday. The older a person gets so will the more decrease his ability in fulfil need life everyday life, the aging process and changes that occur in the elderly also affect elderly For do activity everyday. This also results in the emergence of disturbance in matter sufficient need his life so that can increase dependence the need for help from others. Efforts to increase activity independence elderly need existence role as well as family and existence coaching health. From one of the effort the support family is the most influential factor in matter this. Support family intended for help elderly do activity everyday, so that elderly capable independent or get minimal assistance (Puspitasari, 2019).

In cortex cerebral There are functional areas that divide function from each hemisphere right and left. Brain gym optimizes brain hemisphere right which in a way line big on duty control body part left, as well as functioning for intuitive, feeling, musical, dancing, creative, and seeing whole. Brain right to push man for socializing, communication, interaction with other humans, as well as control emotion. On brain right this also located ability intuitive, ability feeling, blending, and expression body. Brain hemisphere left outline on duty arrange body part right Which functioning for think logical, rational, analytical, ability write and read, speaking, oriented on time, And things which details. Brain left is also center mathematics (Sapardjiman, 2003).

Brain Gym alone aiming for guard balance performance between brain right and left stay optimal. Brain gym provides repair stimulus to the fibers in the corpus callosum which provides Lots connection bidirectional nerve between cortical areas second hemisphere brain, including hippocampus and amygdala. Brain gym movements activate

return connection nerve between body and brain so that make it easier flow energy electromagnetic to all over body. This movement support changes electrical and chemical processes that occur in all mental and physical events (Dennison, 2008).

Impact positive exercise brain in the elderly, after 1 month brain gymnastics implementation happen improvement level independence in the elderly (Lihardo, 2005).

CONCLUSION

Level of independence elderly before done brain gymnastics intervention (pre-test) in most have level dependence light, and only 2 respondents with results independent. Whereas level independence elderly after done brain gym intervention (post test) was obtained part big level dependence light. Analysis results show that there 20 significant influence of brain gymnastics to the level of independence of the elderly.

SUGGESTIONS

With there is brain gym for elderly expected capable maintain level his independence especially in matter this activity life daily living activities, elderly know understanding, benefits and capabilities do/ practice brain gym with minimal assistance even independent without help officer.

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DECLARATION OF CONFLICTING INTEREST

No conflict of interest has been declared.

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AUTHOR CONTRIBUTION

Widya Nurcahyaningtyas: literature search, research data collection, author of research report and manuscripts

Amila Widati: data analysis, data synthesis

Muhamad Ainur Rofiq: literature search, data manuscripts

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