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Research Article

The Effect of Cognitive Puzzle Therapy on the Independence Level of Elderly with Dementia in Nursing Home East Jakarta

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Abstract

Aims: This study aims to identify the effect of puzzle cognitive therapy on the level of independence of elderly people with dementia in nursing homes.

Method : the research used a quasi-experimental pre-post design with control group design. Sampling was taken using a total sampling technique, 24 respondents in the intervention group and 24 in the control group. Puzzle therapy was carried out for 9 sessions. Measurement of independence used the MMSE (Mini mental status examination) questionnaire and the Katz Index. Analysis with dependent t-test at significance 0.05 (CI 95%) and GLM-RM (General Linear Model Repeated Measure).

Results: The results of the paired T test in the intervention group produced a p-value of 0.000, while the control group had a p-value of 0.043. dependent T test and Greenhouse-Geisser (sig) with p value 0.00. Elderly people who are given puzzle activities improve the health and well-being of elderly people with cognitive decline

Conclusion: puzzle therapy can improve increasing independence in elderly people with dementia.

Keywords:

Elderly, Independence, Puzzle Cognitive Therapy

INTRODUCTION

The elderly population is growing as medical facilities and services are improved, birth rates are regulated, life expectancies rise, and mortality rates fall. Extended life expectancy in the elderly does not eliminate the issue of declining body function, which affects the elderly's independence in performing daily activities. The structure and function of our cells, tissues, and organ systems deteriorate with grow older, which has a negative impact on our physical and mental health. This, in turn, affects how our family, socioeconomic status, and social roles change, which makes it more difficult to adapt to new situations and engage in social interactions (1).

The elderly's physical changes in the nervous system occur with impaired memory, thinking, comprehension, orientation, arithmetic, language and value functions as a result of impaired brain function, experiencing a decline in the body system which includes physical, mental and psychosocial changes (2)

Dementia is a syndrome of decreased cognitve function which results in disruption of daily activities and is accompanied by behavioral disorders without delirium or major psychiatric disorders (3). The elderly often suffer from Alzheimer's dementia, which is a degenerative disease that occurs due to a decrease in brain function which affects emotions, memory, decision making,

behavior and other brain functions, thereby interfering with activities in daily life, (4).

Health problems in the cognitive function of the elderly are very important for the well-being of the elderly. Cognitive activities carried out regularly are thought to be able to maintain excellent cognitive function in the elderly. This needs to be proven by examining differences in cognitive function in groups of elderly who carry out cognitive activities regularly and non-routinely. It is believed that frequent cognitive exercises might help the elderly maintain outstanding cognitive function. This has to be demonstrated by comparing cognitive performance between groups of older people who engage in cognitive activities frequently and irregularly (5).

Puzzle Therapy is a non-pharmacological therapy to prevent decline in cognitive function (6). The elderly can engage in brain-training exercises with puzzle therapy, which reassembles pictures that have been broken into pieces, to improve their capacity to think critically, develop patience, and become accustomed to sharing. Puzzle therapy is a cognitive exercise that stimulates the brain by providing adequate stimulation to maintain and improve the brain's remaining cognitive functions. The brain will work when taking, processing, interpreting

images or information absorbed, and retaining the information obtained (7).

METHODS

The research design used a quasi-experimental design with a two-group pre-test-post-test control group design carried out for 3 weeks at Nursing Home East Jakarta. Sample collection was based on inclusion criteria. The elderly were required to be conscious and peaceful, to have mild to severe dementia, and to not be receiving medical treatment, do not have any hearing, vision, or communication issues. The sample size used in this research using the Lameshow formula obtained 24 respondents in each group. The sampling technique used is a non-probability sample using the sampling technique method in this research using purposive sampling. In this study, MMSE (Mini mental status examination) questionnaire and Katz index are used to assess elderly independence. The intervention group had 9 sessions of puzzle therapy over a three-week period, with each session involving a re-assessment of independence using the Katz index. Frequency distributions and percentages are used in univariate analysis, the t-dependent test with a level of significance of 0.05 (CI 95%) is used in bivariate analysis, and the Generalized Linear Model (GLM) is used in multivariate analysis.

RESULT

Characteristics Of Respondents

The results of the research on the characteristics of respondents include age, gender and independence of the elderly

Table 1. Distribution of respondent characteristics by age, gender, and level of independence

	Variable	Intervention f (%)	Control f (%)
Age	elderly	18 (75.0%)	14 (58.3%)
	old age elderly	6 (25,0%)	8(33.3%)
	very old		2 (8.3%)
Gender	females	11 (45,8%)	12 (50%)
	male	13 (54.2%)	12 (50%)

Independence	Full function	1 (4.2%)	1 (4.2%)
	Moderate impairment	20 (83.3%)	18 (75.0%)
	Severe functional impairment	3 (12.5%)	5 (20.8%)

According to the table above, respondents in both the intervention group (75.0%) and the control group (58.3%) had a majority of elderly. Males made up the majority (54.2%) of the intervention group, compared to females, who made up 50% of the control group. Elderly adults' independence was moderate impairment (83.3%) compromised in the intervention group, compared to predominantly (75%) somewhat impaired in the control group.

Level of independence of elderly people with dementia before and after intervention Therapy puzzle

The following table 2 shows the findings of study on the level of independence of elderly people with dementia both before and after intervention.

Table 2 Level of independence of elderly people with dementia before and after intervention therapy puzzle

Variabel Independence	Mean	Std Deviasi	N	Std Error Mean	df	Sig(2-tailed)
Group Intervention Pre-Post Therapy puzzle	-1,875	0,741	24	0,151	23	0.000
Group control Pre-Post Therapy puzzle	0.167	0,381	24	0.155	23	0.043

The test findings are displayed in the table 2 with a p value of 0.000 (0.05) for the intervention group and a p value of 0.043 (>0.05) for the control group. The study's findings showed a significant difference between the intervention group's state before and after receiving cognitive puzzle treatment.

Elderly Control Group and Intervention Group Before and After Therapy Intervention: Differences in Levels of Independence

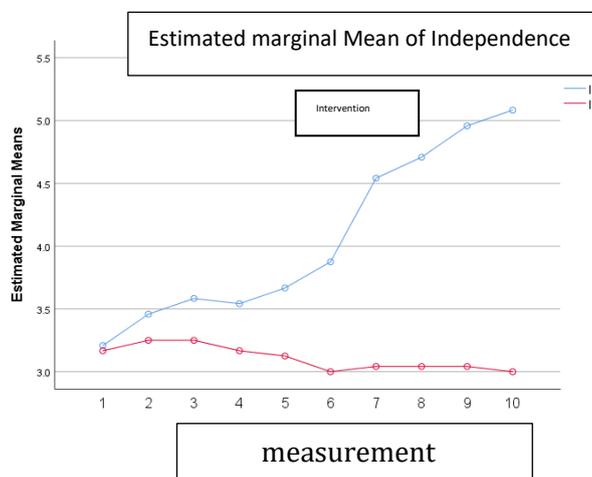
The study's findings, which are shown in table 3, indicate that there are differences in levels of independence between the control and intervention groups before and after puzzle treatment.

Table 3. Elderly Control Group and Intervention Group Before and After Therapy Intervention: Differences in Levels of Independence.

Variable Level of independence	Group	Mean	Std Deviation	N	Levene's Sig	Sig (2 tailed)
Pre-test	control	3.17	0.761	24	0.684	0.857
	intervention	3.21	0.833	24		
Post test	control	3.00	0.659	24	0.400	0.000
	intervention	5.08	0.504	24		

After getting puzzle cognitive treatment, the intervention and control groups differ significantly from one another, as seen in the table 3 (p value 0.000 (0.05).

Score of independence during puzzle therapy administration



According to the graph, the intervention group (blue line) achieves a maximum level of independence with a maximum increase in the sixth measurement, whereas the control group (red line) tends to decrease insignificantly from the sixth measurement to the tenth measurement.

DISCUSSION

Based on the results of research conducted by researchers on elderly people with dementia, it was found that most of the respondents were male, 54.2% (intervention group), while in the control group it was 50%. The results of the study illustrate that there are more elderly men with dementia than women (Sonza, Badri and Erda, 2020). The level of independence of elderly men tends to have physical strength with a better level of independence compared to women (4). Independence can decrease due to being lazy about moving or moving from one place to another, which can cause elderly people to forget easily and decrease cognitive function. Most of the respondents were elderly (60-74 years). The occurrence of natural cognitive decline is caused by some brain cells gradually starting to die, the elasticity of blood vessels decreases, the brain cells start to die and will not regenerate so this causes the

elderly to experience a decline in intellectual function, the speed of processes in the central nervous system decreases. As age increases, this change is experienced by almost everyone who reaches the age of 70 years.

Nearly all of the elderly's independence in this study was moderately impaired. It is very important to increase the independence of the elderly, the parameters of independence are daily activities to achieve healthy and quality elderly, according to other research (8), apart from that, independence also requires several programs that can be carried out to improve memory, therapy stress management experienced by the elderly, social skills therapy for the elderly, communication therapy between the elderly and behavioral therapy (5). Impaired cognitive function is a serious problem that can interfere with the daily activities and independence of the elderly. This cognitive function disorder varies greatly between mild, moderate and severe. In the elderly, decreased cognitive function can cause a decrease in perception, sensory, motor responses and a decrease in proprioceptive receptors in the central nervous system (CNS), which can cause postural balance disorders. Postural

balance disorders are usually caused by weakness of the extremity muscles, postural stability, and also physiological disorders of one of the senses in our body (9). Decreased cognitive function in elderly people with dementia, caused by irreversible, progressive brain disorders, slowly damages memory and thinking abilities until they finally lose the ability to perform the simplest tasks (10). The analysis using the paired T-Test in the intervention group generated a level of independence with the use of pre-test and post-test puzzle therapy treatments, specifically p-value 0.000. The p-value for the control group was 0.043. This demonstrates that there is a substantial change in the level of independence of the elderly with dementia between the pre-test and post-test in the intervention and control groups. The intervention used in this study was cognitive puzzle therapy exercises played jointly to preserve or promote independence in older adults with dementia. Playing puzzles has the advantage of stimulating brain activity, strengthening memory, and improving cognitive skills. Puzzle therapy doesn't tax your energy or mind too much because it is packaged as a game, it is very enjoyable, and it relaxes the brain while also engaging in cognitive activities that can increase enthusiasm and improve memory. You can play puzzles in your free time without the need for an instructor, which promotes smooth brain function (11)

The results of data analysis using the independent t test in the intervention and control groups produced a value for the level of independence of elderly people with dementia after implementing the puzzle therapy intervention with a p-value of 0.000. In the control and intervention groups before implementing the puzzle therapy intervention, the p-value was 0.857, this shows that there was a significant increase in independence after being given puzzle therapy. The results of previous research showed that the management of puzzle therapy which had been carried out

for 6 meetings for 1x20 minutes per day showed an increase in MMSE and SPSMQ scores, in other words there was an increase in cognitive and intellectual function (12). The results of other research on elderly people who were given puzzle modality therapy by cadres experienced a decrease in dementia scores as measured based on the MMSE questionnaire. This shows that this therapy can be used to slow the onset of cognitive decline in the elderly (13). Decline in cognitive ability can be minimized, elderly people can include puzzle therapy in their daily activity schedule to optimize cognitive activity because thinking activities can slow down the process of decline in cognitive function (14). Nurses can develop puzzle therapy to increase the independence of elderly people so they are able to meet their needs (15). Reducing the risk of dementia is also associated with exercise frequency (participation in such activities). Cognitive training several times a week, achieved with TECH, was shown to reduce the risk of dementia by up to 50% more than once a week training (16). The results of previous research conducted in Slawi Indonesia showed a significant relationship between the level of dementia and basic daily activities with a correlation value of p value 0.027 (17).

Improving occupational engagement, such as participating in cognitive leisure activities, may promote health and well-being of older adults with subjective cognitive decline, and may delay future cognitive and functional decline (15). For example, older adults who participate in leisure activities with high cognitive demands such as quilting and digital photography. Elderly people who are given puzzle activities by increasing work engagement can improve the health and well-being of elderly people with subjective cognitive decline, and can delay future cognitive and functional decline (16)

Based on Drothea E Orem's theory, namely self-care deficit of caring, this concept emphasizes that every individual has the

ability to care for themselves, which emphasizes the individual's ability to fulfill self-care needs independently, as long as conditions are still possible and emphasizes the client to become a self-care agent for himself.

The results of the independence research using the Katz index, participant were selected based on research inclusion criteria, after being measured, the elderly were given intervention in the form of puzzle therapy for 45 minutes, 9 days within 3 weeks (18,19). The results of research show that puzzle therapy can stimulate a little work to open the way for oxygen, nutrients and blood supply to the brain to delay the severity of dementia. The more often puzzle therapy is done, it can train patience, get used to and sharpen thinking power in carrying out daily activities so that it can improve and maintain self-care in elderly people with dementia. Previous research shows that there is a significant effect of puzzle playing therapy on elderly people with dementia (20). Puzzle therapy is a kind of play therapy in which the hands and eyes are coordinated to improve fine motor skills. Puzzle games itself have the role of strengthening short-term memory, improving brain spatial abilities and delaying dementia, practicing problem solving, developing motor and cognitive skills, and training patience (7)

The graphic results show a significant difference in the intervention group in achieving a maximum score of increasing independence for elderly people with dementia compared to the control group.

The intervention group indicated a rapid increase in the level of independence of elderly people on the sixth day after the implementation of the puzzle therapy intervention, the increase was gradual during days 7 to 10. Meanwhile, in the control group, the graph of increasing independence of elderly people with dementia in the control group had an increase but it was not significant, it tended to be flat and at points on days 2 and 3, day

6 after the intervention decreased. In accordance with the data from the research conducted, it was found that on the sixth day, because the therapy puzzle intervention was often carried out on the first to fifth days, the respondents had quickly put together the puzzle in a short time, so that the rotation in the puzzle game, the respondents had memorized the puzzle game that was played, such as the puzzle given about Flora and fauna, respondents were very enthusiastic about participating in puzzle games as evidenced by the time contract for providing puzzle therapy.

Research Limitations

The limitation of this research is that at the time of conducting the research, it involved respondents with different levels of demensia. Researchers have not been able to control respondents who took medication for demensia.

CONCLUSION

Puzzle therapy has a positive impact on the level of independence of elderly people with dementia, so it is recommended that it can be used as a program in nursing homes. The kind of picture on the puzzles used are in accordance with the needs of the elderly so that they can have maximum impact. Future research is recommended to adjust the puzzle images according to the respondent's level of dementia.

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