

**The Effectiveness of Puzzle Therapy in Improving the Cognitive Function of the Elderly**

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Correspondent Author:	Abstract
Freny Ravika Mbaloto  Email : frenymbaloto@gmail.com	Mild cognitive impairment is a term for people who are at risk of developing dementia. Cognitive decline is an elderly perspective that is commonly a health problem because it is closely related to physical health, psychological health, and quality of life in the elderly. This study aimed to determine the effect of puzzle therapy on the cognitive function of the elderly. This type of quantitative research is pre-experimental with a one-group pretest-posttest design approach. The population in this study was 24 elderly people, using a saturated sampling technique. The intervention carried out was puzzle therapy given for 30-60 minutes over a period of 1 week. Puzzle therapy is a fragment of several images from a complete picture that is designed to stimulate the brain so that the brain's cognitive role increases. The cognitive abilities of the elderly were measured using the MMSE (Mini-Mental State Examination) questionnaire in the form of a test consisting of 30 points of cognitive function including orientation, registration, attention and calculation, remembering, and language. Score 24-30 (good cognitive function), score 1-23 (cognitive impairment). hypothesis analysis using the Wilcoxon test. The results of the study showed that the puzzle therapy variables influence the cognitive abilities of the elderly (p.value 0.01). To improve the cognitive function of the elderly, it can be done through scheduled puzzle therapy in the daily activities of the elderly.
Keywords:	
Cognitive, Dementia, Elderly, Puzzle Therapy.	

**INTRODUCTION**

Aging is the most significant factor affecting a person's cognitive function decline. With increasing age, elderly people usually experience a decrease in this function (Jiang et al., 2021). Cognitive decline is an elderly perspective that is commonly a health problem because it is closely related to physical health, psychological health and quality of life in the elderly. Cognitive impairment is complained of by 39% of elderly aged 50-59 years, increasing to more than 85% at the age of over 80 years (Benya et al., 2021). Mild cognitive impairment is a term for people who are at risk of developing dementia. Dementia is a syndrome that affects memory, thinking, behavior and the ability to carry out daily activities (Evi et al., 2021; Arisandi, 2023).

The prevalence and incidence show that the number of people with dementia will continue to grow, especially in countries with a demographic transition. The total number of people with dementia worldwide in 2010 was estimated at 35.6 million and is projected to almost double every 20 years, to 65.7 million in 2030 and 115.4 million in 2050. The total number of new dementia cases each annually worldwide nearly 7.7 million, implying one new case every four seconds (World Health Organization, 2012). The estimated number of Alzheimer's disease sufferers in Indonesia in 2013 reached one million people. That number is expected to increase drastically to double by 2030, and to four million people by 2050 (Ministry of Health RI, 2014). Burton et al. (2013) identify risk factors for dementia including alcohol abuse, smoking, obesity, ischemic heart disease, diabetes, anxiety, depression, hypertension.

Hypertension causes acceleration of atherosclerosis in brain tissue which has implications for cognitive impairment. Adequate management of hypertension reduces the triggers for cognitive impairment as well as vascular complications and atherosclerosis which play a role in cognitive decline (Hutagalung, 2021). Some research results that hypertension is a factor that increases the risk

of cognitive dysfunction (Ismaya, Kusumawati and Murti, 2017; Wahyuniarti, Bahrudin and Safithri, 2017).

Things that can be done in the elderly to improve cognitive function is through puzzle therapy. By playing puzzles the elderly will stimulate their memory and creativity to think and will carry out the game happily and enthusiastically (Arisandi, 2023). In line with the results of the study that there is an effect of puzzle therapy on the cognitive function of the elderly (Isnaini and Komsin, 2020; Nurleny et al., 2021). Based on this description, a study was conducted which aimed to determine the effect of puzzle therapy on the cognitive function of the elderly.

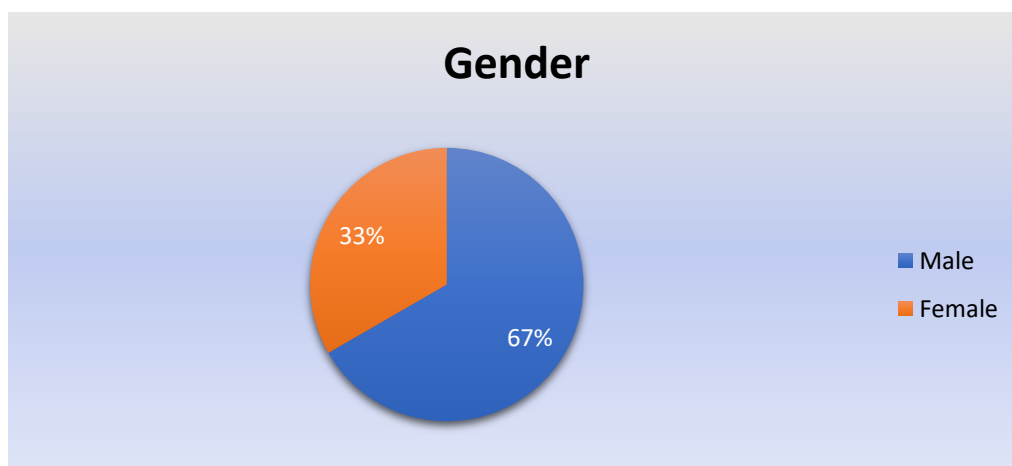
## RESEARCH METHODS

Types of research quantitative pre-experimental type with a one group pretest-posttest design approach. namely the research design contained a pretest before the intervention was carried out and a posttest was carried out after the intervention was given (Dharma, 2011; Saryono and Anggraeni, 2013). Research conducted in March, 2023 at PWST Tresno Mukti Turen with an elderly population (n=24). The intervention was puzzle therapy given for 30-60 minutes over a period of 1 week. Puzzle therapy is a fragment of several images from a complete picture which is designed to stimulate the brain so that the brain's cognitive role increases.

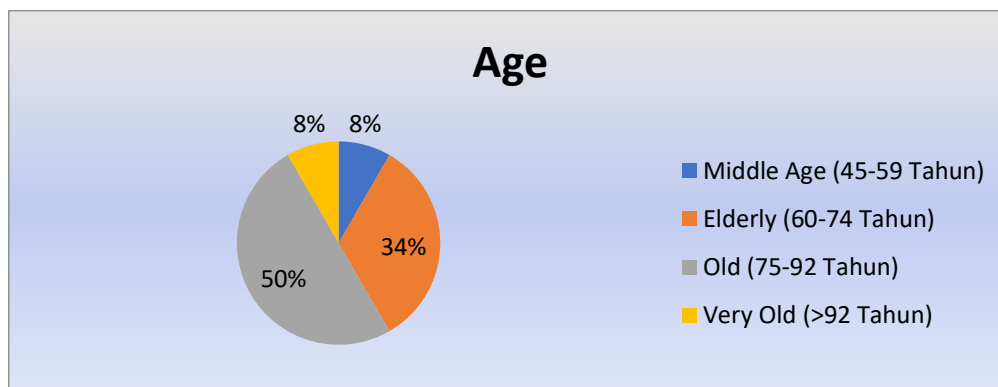
This study used a saturated sampling technique in which the entire population was sampled. The inclusion criteria are elderly people who are at PWST Tresno Mukti Turen, suffering from hypertension, while the exclusion criteria are elderly people who are illiterate. Before the puzzle therapy was implemented, the cognitive abilities of the elderly were measured using the MMSE (Mini Mental State Examination) questionnaire in the form of a test consisting of 30 cognitive function points including orientation, registration, attention and calculation, memory, and language. Score 24-30 (good cognitive function), score 1-23 (cognitive impairment) (Sunarti et al., 2019). The statistical test used is the marginal homogeneity test. This research has fulfilled the principles of research ethics, namely anonymous, confidential, useful and does not cause harm. Permit of this study on letter number 501.a/A.1/A1.07/PN/STIKes-BK/III/2023.

## RESULTS

Implementation of Clinical Learning Practice (PBK) at PWST Tresno Mukti was carried out from 6 March 2023 to 18 April 2023. The assessment was carried out on 6-7 March 2023 by filling out a questionnaire for 24 elderly people. To support the results of the assessment obtained through distributing questionnaires, interviews were conducted with the elderly and administrator officers. The analysis was carried out based on the frequency distribution of primary data obtained from a data collection questionnaire on the elderly at LKSLU Tresno Mukti. Then the implementation was carried out for 32 days from 8 March - 9 April 2023 and the evaluation was carried out on 11-12 April 2023. From the figure 1, it can be seen that the elderly at LKSLU Tresno Mukti are mostly male (67%).

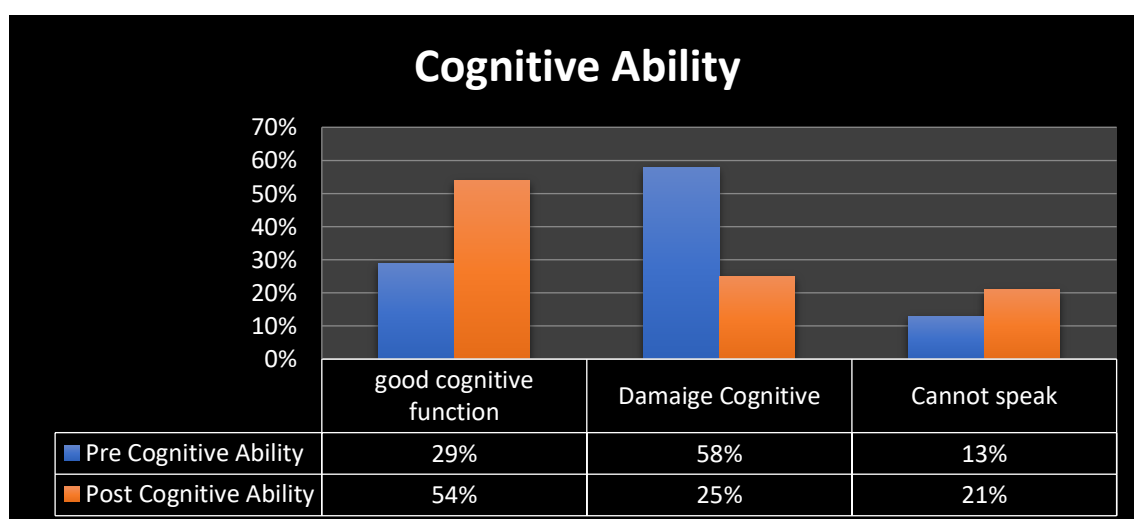


**Figure 1. Distribution of Elderly by Gender in LKSLU Tresno Mukti Year 2023**



**Figure 2. Distribution of Elderly by Age in LKSLU Tresno Mukti Year 2023**

From the picture above it can be seen that the elderly in LKSLU are mostly aged 75-92 years (55%).



**Figure 3. Distribution based on Elderly Cognitive Function before and after Therapy at LKSLU Tresno Mukti in 2023**

From the picture above, it can be seen that after therapy for the elderly for 7 days, there was an increase in cognitive function from 33% to 54%, while cognitive impairment decreased from 54% to 25%. Table 1 explains the results of statistical tests obtained by the value of  $p$  (0.01) this puzzle therapy has an effect on improving the cognitive abilities of the elderly.

**Table 1. The Effectiveness of Puzzle Therapy in Improving the Cognitive Function of the Elderly**

		Post Cognitive Ability			Total	Value ( $p$ )
		Damage Cognitive	Cognitive Good	Cannot Speaking		
Pre Cognitive Ability	Damage cognitive	4	8	2	14	*0.01
	Good cognitive	2	5	0	7	
	Cannot Speak	0	0	3	3	
Total		6	13	5	24	

\*Wilcoxon test

## DISCUSSION

This study aims to determine the effectiveness of puzzle therapy on the cognitive function of the elderly. Therefore, before and after being given puzzle therapy, an assessment of cognitive function was carried out using the MMSE questionnaire (Mini Mental State Examination) in the form of a test consisting of 30 points of cognitive function including orientation, registration, attention and calculation, remembering, and language. In line with McDougall (2019); Yu and Wei (2021) in his article explains that the MMSE examination designed to measure the cognitive abilities of the elderly includes orientation, calculation, memory and attention. The results of the initial assessment showed a high percentage of the elderly with cognitive impairment (54%). These results are proven through the results of questionnaires for the orientation aspect, the average elderly who answered correctly 6-7 people, questions related to registration and remembering aspects, the average elderly answered correctly 4-5 people, questions regarding aspects of calculation attention and language, the average answer of the elderly That's right 2-3 people. While the results of the final assessment found a decrease in cognitive function damage after the elderly were routinely given puzzle therapy (25%).

Statistical test results obtained p value (0.01) this puzzle therapy has an effect on improving the cognitive abilities of the elderly. The researcher's assumption is that if the elderly with cognitive decline are routinely given puzzle therapy, it will have an impact on improving cognitive function. Cognitive disorders, namely conditions related to the aging process, where there is a disturbance in the ability to think, learn, pay attention/focus, make decisions that have an impact on daily life (Putkonen et al., 2011). Decreased cognitive ability in the elderly is a factor that causes the elderly to be vulnerable to cognitive dysfunction such as dementia which impacts the ability to meet daily needs and the degree of dependence on other people increases (Supriyatno and Fadhilah, 2016). To minimize the decline in cognitive abilities, elderly people can include puzzle therapy in their daily activity schedule to optimize cognitive activities (Yu and Wei, 2021). Cognitive activity is activity that involves thinking activities (Wreksoatmodjo, 2015). Activities that involve the function of thinking can slow down the process of decreasing cognitive function (Putkonen et al., 2011). Poor cognitive activity will have a big risk of worsening cognitive function in the elderly (Wreksoatmodjo, 2015). In line with research Djasaputra and Halim (2019) that cognitive function was found to be better in the elderly with routine activities compared to the elderly who did not do routine activities. Isnaini & Komsin, (2020) explained in his research that puzzle therapy is an alternative to overcome cognitive impairment in the elderly.

## CONCLUSION

Based on the results and discussion it can be concluded that before being given puzzle therapy, there were 13 elderly people with cognitive impairment. After being given puzzle therapy, there was a decrease in the number of 6 elderly people who experienced cognitive impairment. Puzzle therapy has an effect on improving the cognitive abilities of the elderly. Suggestion to improve the cognitive function of the elderly, it can be done through scheduled puzzle therapy in the daily activities of the elderly

## BIBLIOGRAPHY

- Arisandi, Y. (2023) *Gerontic Nursing Book*. Pekalongan: Nasya Expanding Management.
- Benya, R. et al. (2021) *Textbook of Gerontic Nursing*. Indramayu: Adanu Adimata.
- Burton, C. et al. (2013) 'The association of anxiety and depression with future dementia diagnosis: A case-control study in primary care', *Family Practice*, 30(1), pp. 25–30. doi: 10.1093/fampra/cms044.
- Dharma, KK (2011) *Nursing Research Methodology; Guidelines for Implementing and*

Applying Research Results. Jakarta: CV. TransInfoMedia.

- Djajasaputra, ADR and Halim, MS (2019) 'Elderly Cognitive Function with Routine and Non-Routine Cognitive Activities', *Journal of Psychology*, 46(2), p. 85. doi: 10.22146/jpsi.33192.
- Evi, S. et al. (2021) *Reminiscence Helps Prevent Dementia in the Elderly*. Yogyakarta: Zahir Publishing.
- Hutagalung, S. (2021) *Hypertension, Cognitive Disorders and Blood Pressure as Causes of Stroke*. Bandung: Nusamedia.
- Ismaya, DRD, Kusumawati, R. and Murti, B. (2017) 'The Relationship between Hypertension and Cognitive Function Disorders in the Elderly at the Elderly Posyandu Assisted by the Ngoresan Health Center, Surakarta', *Community Medicine Nexus*, 6(2), pp. 33–44.
- Isnaini, N. and Komsin, NK (2020) 'Description of Cognitive Function in the Elderly Using Puzzle Therapy', *Human Care Journal*, 5(4), p. 1060. doi: 10.32883/hcj.v5i4.854.
- Jiang, H. et al. (2021) 'Cognitive impairment and all-cause mortality among Chinese adults aged 80 years or older', *Brain and Behavior* published, (July), pp. 1–11. doi: 10.1002/brb3.2325.
- Indonesian Ministry of Health (2014) *Indonesia Health Profile 2013*. Jakarta: Indonesian Ministry of Health. doi: 351,770,212 Eng P.
- McDougall, G. (2019) 'A Critical Review of Research on Cognitive Function/Impairment in Older Adults', *Arch Psychiatr Nurs*, 9(1), pp. 22–33. doi: 10.1016/S0197-4572(80)80104-2.
- Nurleny et al. (2021) 'Cognitive Training Through Puzzle Therapy Against Dementia Levels for the Elderly at Tresna Werdha Social Institution (Pstw) Sabai Nan Aluih Sicincin Padang Pariaman Tahun 2021', *Abdima Saintika*, pp. 1–10. Available at: <https://jurnal.syedzasaintika.ac.id>.
- Putkonen, P. et al. (2011) 'Cognitive Impairment', *Department of Health and Human Services, Centers for Disease Control and Prevention*, 6(3), pp. 257–263. doi: 10.1097/00002030-199203000-00002.
- Saryono and Anggraeni, MD (2013) *Qualitative and Quantitative Research Methodology in the Health Sector*. Yogyakarta: Nuha Medika.
- Sunarti, S. et al. (2019) *Basic Principles of Elderly Health (Geriatrics)*. Malang: UB Press.
- Supriyatno, H. and Fadhilah, N. (2016) 'Elderly Cognitive Function Affects the Level of Independence in Fulfilling Activities', *Scientific Journal of Health*, 5(9). doi: 10.35952/jik.v5i9.21.
- Wahyuniarti, A., Bahrudin, M. and Safithri, F. (2017) 'Relationship Between Hypertension and Decreased Cognitive Function in the Elderly', *Saintika Medika*, 9(2), p. 89. doi: 10.22219/sm.v9i2.4135.
- World Health Organization (2012) 'Dementia'. *Alzheimer's Disease International*.
- Wreksoatmodjo, BR (2015) 'Cognitive Activity Affects Cognitive Functions of Elderly in Jakarta', *Mirror of the World of Medicine*, 42(1), pp. 7–13.
- Yu, S. and Wei, M. (2021) 'The influences of community-enriched environment on the

cognitive trajectories of elderly people', *International Journal of Environmental Research and Public Health*, 18(16). doi: 10.3390/ijerph18168866.