



Description of Cognitive Function in The Elderly with Puzzle Therapy Intervention: Case Study

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ABSTRACT

The elderly can experience a decrease in cognitive function because the body functions of the elderly also tend to decrease. Cognitive disorders in the elderly can interfere with and affect the behavior or activities of the elderly. The role of nurses is very important to provide interventions that can improve the cognitive function of the elderly. Non-pharmacological efforts are needed to overcome cognitive function problems in the elderly, one of which is through puzzle therapy. Puzzles in the form of pictures in the form of small pieces to hone intelligence, lead to patience, introduce the ability to share, and are a fun way to train the brain, especially for the elderly. This research method is a case study method with a nursing care approach to the elderly aged 80 years, the MMSE and SPSMQ questionnaires are used to assess cognitive and intellectual development in the elderly. The results showed that the application of puzzle therapy which had been carried out for 6 meetings with an intensity of 1x20 minutes per day showed an improvement in the results of the MMSE and SPSMQ scores, in other words there was an increase in cognitive and intellectual function in the elderly. For maximum results, puzzle preparation exercises should be carried out regularly and can be done together in nursing homes so that the elderly are more motivated and more enthusiastic.

Keywords: cognitive function, elderly, puzzle

Introduction

According to UN data, the 2010-2035 demographic analysis shows that Indonesia is entering a period of aging. The elderly population in 2020 in Indonesia can reach 28.8 million people, making Indonesia the largest population in the world (Health Research and

Development Agency, 2018). According to the Ministry of Health's 2016 health profile data, 8.3% of the population is aged 60 years and over compared to the total population. In 2020, the average number of people with dementia in Indonesia is 314,100 people (Erna Damayanti et al., 2023). In Indonesia it is estimated that the number of people with dementia will increase from 960 thousand in 2013 to 2030 and 3,980 thousand in 2050 (Erwanto & Kurniasih, 2020). The level of decreased cognitive function in the elderly currently represents more than 40% of the elderly population (Layla & Wati, 2017).

The elderly experience a decrease in their physical endurance and cognitive function, such as muscle weakness and decreased memory (Hatmanti & Ana Yunita, 2019). The process of aging is something that is marked by a decline in physical, mental and social conditions. The brain's nervous system in the elderly will experience changes due to physical changes and the aging process, the elderly will experience changes in intellectual activity and gradually changes in cognitive function occur, especially in the ability to remember (Yuliyanti, Kustanti, & Wahyuni, 2022). Decreased cognitive function can affect the daily life and activities of the elderly. Impaired cognitive function can interfere with memory, intelligence, speech, attention, reasoning, and ways to solve problems, so that the behavior and daily life of the elderly can be disrupted (Dewi, 2016). Cognitive decline in the elderly is a public health problem that also affects families, communities and communities (Erwanto & Kurniasih, 2020).

The role of nurses and families is very important in preventing and overcoming cognitive decline in the elderly by participating and carrying out activities in daily activities that can improve the cognitive function of the elderly. Based on the above, it is necessary to make efforts to overcome cognitive decline in the elderly, one of the efforts that can be offered is through the implementation of puzzle therapy.

Puzzles consist of pieces of images that can help sharpen memory, increase patience, and familiarize sharing skills (Ekasari, Riasmini, & Hartini, 2019). Puzzles are also a fun way to train the brain, especially for people over 50 years old (Pae et al., 2021). Elderly who do memory therapy by playing puzzles can improve their cognitive and verbal abilities because complex daily activities can improve cognitive function in the elderly (Givon Schaham, Buckman, & Rand, 2022).

Objective

Based on what has been said before, the purpose of this study was to evaluate the application of puzzle therapy to cognitive function in the elderly as an intervention in nursing diagnoses of memory disorders.

Method

This research uses the case study method with a nursing care approach where according to Lueckerotte (2000) in (Kholifah, 2016) gerontic nursing is a science that studies care in the elderly that focuses on assessing health and functional status, planning, implementation and evaluation. The subjects in this study were 80-year-old elderly people in the Garut elderly home. This study was conducted daily from 13 February to 24 February 2023. Data collection was carried out for three days, implementation was carried out for 6 days and evaluation was carried out 2 times by means of observation, interviews and objective assessment using instruments. Results the assessment obtained from the patient was adjusted to interviews with elderly nurses and available patient data. Then the data that has been

obtained is grouped so that a nursing diagnosis is achieved which is the author's reference in carrying out implementation and evaluation in this study.

To find out the cognitive function of the elderly, the Mini Mental State Examination (MMSE) instrument was used. This questionnaire consists of 11 question items with a total score of 30. These questions are divided into 5 sections, namely orientation, memory registration, attention and calculation, re-introduction and language. Then to determine the client's intellectual level, the Short Portable Mental Status Questionnaire (SPMSQ) instrument is used. This questionnaire consists of 10 questions about: orientation, personal history, memory in relation to self-care abilities, distant memory and mathematical abilities.

Results

The description of the patient's characteristics, namely Mrs. N is 80 years old, is Muslim and has Sundanese ethnicity. The results of the study obtained the identification of the client's SPMSQ getting a score of 6-8, which is in the category (moderate intellectual impairment). Identification using the MMSE client is in the range 0-17, namely severe cognitive impairment.

The results of the study found that Mrs. N in terms of orientation had not fully stated the date, year and month correctly, for registration the client had fully answered, for attention and calculations there were still 4 wrong answers out of 5 question points, but at points considering Mrs. N answered all of them correctly, for language there are still 4 out of 11 questions that are wrong. Mrs. N did not know names, could not subtract numbers and was lacking in time orientation. Apart from that, Mrs. N said that in her daily life it was easy to forget. In objective observation, Mrs. N tends to have memory problems, has difficulty focusing when spoken to, often forgets to put things away, looks confused when communicating to find the right words.

Based on the results of the study above, it was found that the nursing diagnosis of memory impairment was related to the aging process where researchers used the IDHS (Indonesian Nursing Diagnosis Standards) to make nursing diagnoses. Management in the form of memory exercises carried out on patients includes correcting orientation errors, facilitating recall of experiences, stimulating memory of recent events, facilitating orientation abilities. The author also carried out non-pharmacological implementation in the form of puzzle therapy for 6 meetings with an intensity of 1 x 20 minutes per day. The implementation of puzzle therapy on Mrs.N can be outlined in the following table:

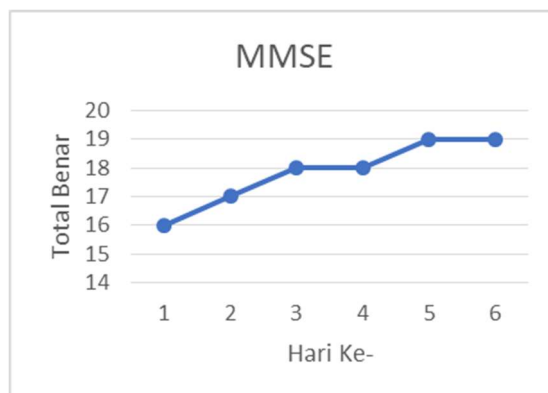


Figure 1. MMSE level per day

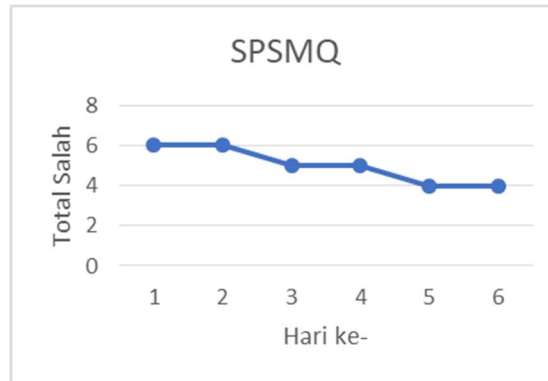


Figure 2. SPSMQ level per day

The evaluation of this study was that after taking action in the form of nursing care for 6 × 24 hours with the intensity of playing puzzles 6 times a meeting for 1 × 20 minutes per day it was found that the level of cognitive function that had been measured using the MMSE got an increase in the total correct result of 16 (There was damage to aspects moderate-severe function) to 19 (damage to light functional aspects), then the results of measurements using the SPSMQ showed that there was a decrease in the number of errors from a score of 6 (moderate Intellectual Impairment) to a score of 4 (mild Intellectual Impairment). Therefore, based on these results, it can be seen that there is an increase in cognitive and intellectual function in the elderly after nursing care and non-pharmacological interventions in the form of puzzle therapy for 6 meetings with an intensity of 1x20 minutes per day. So that the provision of nursing interventions can be continued to address cognitive and intellectual impairment problems in the elderly.

Discussion

The assessment that has been carried out on the patient refers to several signs and symptoms that lead to a nursing diagnosis of Memory Impairment related to the aging process. Memory impairment is defined as an inability to remember information or behavior (IDHS 2017). The signs and symptoms that can occur in patients with memory disorders include forgetting easily, new skills difficult to learn, actual information cannot be remembered, certain behaviors that have been done will be forgotten, tend not to be able to remember events, new skills that have been previously learned are not can be repeated (IDHS, 2017).

Conditions that can cause patients to experience memory impairment are the aging process, this is in line with the etiology listed in the Indonesian Nursing Diagnostic Standards which include inadequate intellectual stimulation, cerebrovascular disorders, the aging process, hypoxia, effects of pharmacological agents, stress, psychological factors, and environmental distraction (IDHS, 2017). This is in line with Sigalingging (2022) which states that memory decline can be related to age, the elderly tend to fail to remember events or behaviors they have experienced often forgetting names, places, events. Factors that cause memory loss are because the process of recovering stored memories can be slower than younger people, as well as the limitations of the elderly in using memory (Sigalingging, 2022).

Cognitive impairment due to the aging process leads to cessation of brain activity, thereby reducing calculation, concentration, decision making, thinking, memory impairment,

communication problems, sensory changes, decreased concentration, and disturbances in daily activities and attention (Riyani, Sarir, & Fatmawati, 2020). Overcoming memory decline can be done by doing brain-sharpening activities, such as doing crafts, reading, composing words, or doing brain exercises. The intervention and implementation that has been carried out in patients is puzzle therapy, according to some literature puzzle therapy is a fairly effective therapy to improve memory or memory in the elderly.

Research by Cancela et al., (2020) Among 55 study participants, there was a decrease in cognitive impairment, an increase in quality of life, and functional independence occurred after being given the puzzle treatment. The results of the study are in line with Feiqah's research (2020), namely after being given puzzle therapy for 12 times it can be said that puzzle therapy has an effect on improving cognitive function, although this increase is not significant, maximum results can be achieved if the intervention is carried out routinely and consistently. This is motivated by the fact that brain gymnastic movements including playing puzzles can activate the three dimensions of the brain, namely the lateral dimension, the dimension of focusing and the dimension of concentration. The human brain consists of a dynamic inter-neural network, it is influenced by strong stimuli so that when a stimulus occurs the neuronal connections in the brain also get stronger (Riyani, Sarir, & Fatmawati, 2020). Brain gymnastics or providing puzzle therapy can improve cognitive function because it can stimulate blood flow to the brain and strengthen neuronal connections in the brain (Azizah, Martiana, & Soedirham, 2017).

Research conducted by Tuppen, (2012) states that to improve cognitive function in the elderly it is recommended to take part in cognitive training, especially by way of cognitive stimulation (puzzles) and reality therapy. These activities can be carried out 20-30 minutes per day so that they can slow down memory disturbances which have an impact on impaired cognitive function in the elderly. Stimulation resulting from thinking, concentration and memory processes stimulated by the installation of the puzzle will provide sufficient stimulation to enhance and maintain the remaining cognitive functions. The brain will work by processing, receiving and interpreting the images that have been absorbed and seen (Givon Schaham, Buckman, & Rand, 2022).

The results of this study is that the application of non-pharmacological interventions in the form of puzzle therapy is able to reduce the level of damage to cognitive function in the elderly, puzzles can be used as an alternative to increase concentration abilities, intellectual abilities, and memory abilities that can affect the memory of the elderly. The elderly's brain will tend to work to remember so that this puzzle therapy can be used as an alternative non-pharmacological intervention in the elderly with decreased cognitive function or with nursing diagnoses of memory disorders. The limitations in this study were the limited intervention time, so the implementation process was not carried out comprehensively to assess the patient's condition. This study was also limited to providing nursing interventions which were carried out at 12.00-16.00, the patient's progress could not be monitored outside of this time.

Conclusion

The results of the study found that the signs and symptoms experienced referred to the diagnosis of memory disorders associated with the aging process. The non-pharmacological intervention and implementation that has been carried out is by doing puzzle therapy. The evaluation results were obtained after 6 sessions of puzzle therapy with an intensity of 1x20 minutes per day, there was an increase in cognitive function in the elderly,

as evidenced by the MMSE results, there was an increase in total true results from 16 (there was moderate to severe damage to functional aspects) to 19 (mild damage to functional aspects).), then the results of the SPSMQ showed that there was a decrease in the number of errors from an incorrect score of 6 (moderate Intellectual Impairment) to a score of 4 (mild Intellectual Impairment).

For best results, this puzzle exercise should be done regularly, accompanied by a nurse or in a group so that the elderly are more enthusiastic. The implications of this study can be used by nurses as a reference and basis for non-pharmacological nursing interventions in cognitive decline and nursing diagnoses of memory disorders. It is hoped that further research can be carried out by adding samples and changing the method of implementation and modifying or adding instruments for measuring cognitive function in the elderly.

References

1. Azizah, L. M., Martiana, T., & Soedirham, O. (2017). The Improvement of Cognitive Function and Decrease the Level of Stress in the Elderly with Brain Gym. *international journal of nursing and midwifery science (ijnms)*, 1(1), 26–31. <https://doi.org/10.29082/ijnms/2017/vol1.iss1.33>
2. Health Research and Development Agency, -. (2018). National Riskesdas Report 2018. *Basic Health Research* 2018, 166. https://labdata.litbang.kemkes.go.id/images/download/Report/RKD/2018/Laporan_Nasional_RKD2018_FINAL.pdf
3. Cancela, J. M., Casal, Á., Sánchez-Lastra, M. A., & Ayán, C. (2020). Brain gym exercises versus standard exercises for institutionalized older people with cognitive impairment: A randomized controlled study. *Asian Journal of Gerontology and Geriatrics*, 15(2), 74–80. <https://doi.org/10.12809/AJGG-2019-383-OA>
4. Dewi, S. R. (2016). Effects of Brain Exercises and Playing Puzzles at the Jember Power Plant. *Journal of Primary Health*, 1, 64–69.
5. Ekasari, M., Riasmini, N., & Hartini, T. (2019). Improving the quality of life of the elderly concept and various interventions. [https://books.google.com/books?hl=id&lr=&id=IWCIDwAAQBAJ&oi=fnd&pg=PR1&dq=\(Ekasari,+M.+F.,+Riasmini,+N.+M.,%26+Hartini+2019\)](https://books.google.com/books?hl=id&lr=&id=IWCIDwAAQBAJ&oi=fnd&pg=PR1&dq=(Ekasari,+M.+F.,+Riasmini,+N.+M.,%26+Hartini+2019))
6. Erna Damayanti, F., Izzah, U., Putu Diahsuri Artini, N., Studi, P. S., & Banyuwangi, S. (2023). The Effect of Playing Puzzle Therapy on Elderly with Dementia. *Nursing Information Journal*, 2(2), 57–61. <https://doi.org/10.54832/nij.v2i2.300>
7. Erwanto, R., & Kurniasih, D. E. (2020). The effectiveness of puzzle therapy on cognitive functions among the elderly with dementia at Tresna Werdha Social Service Center (Bpstw) Yogyakarta, Indonesia. *Bali Medical Journal*, 9(1), 86–90. <https://doi.org/10.15562/bmj.v9i1.1628>
8. Faeiqah, R. F. (2020). Application of Puzzle Therapy to Elderly People with Dementia With Nursing Problems with Memory Disorders in Giring Manding Village, Sumenep. http://digilib.unusa.ac.id/data_pustaka-27385.html
9. Givon Schaham, N., Buckman, Z., & Rand, D. (2022). The Effect of Daily Practice of Puzzle-Game Apps on Cognition in Two Groups of Older Adults: A Pre-Post Experimental Study. *International Journal of Environmental Research and Public Health*, 19(23). <https://doi.org/10.3390/ijerph192315454>

10. Hatmanti, N.M., & Ana Yunita. (2019). Elderly Exercise and Puzzle Therapy Against Dementia in the Elderly Nety. *Journal of Muhammadiyah Nursing*, 4(1), 104–107. <http://103.114.35.30/index.php/JKM/article/view/2634/1946>.
11. Kholifah, S. N. (2016). Gerontic Nursing. Republic of Indonesia Ministry of Health
12. Layla, J. I., & Wati, D. N. K. (2017). Decreasing Cognitive Function Can Reduce Elderly Body Mass Index in Pstw DKI Jakarta Region. *Indonesian Journal of Nursing*, 20(2), 128–132. <https://doi.org/10.7454/JKI.V20I2.489>.
13. Nurleny, Hidayatul Hasni, Yazia Velga, Meriakontesa, & Ulfa Suryani. (2021). Cognitive Training through Puzzle Therapy for the Level of Dementia at Tresna Werdha Social Institution (Pstw) Sabai Nan Aluih Sicincin Padang Pariaman 2021. *Abdimas Saintika*, 1–10. <https://jurnal.syedzasaintika.ac.id>
14. Pae, K., Aldo Marcello, S. (2021). The Effect of Exercise on Board Game (Puzzle) Completion Levels in the Elderly in Old Age Homes. *Journal.Wima.Ac.Id*. <http://jurnal.wima.ac.id/index.php/NERS/article/view/4047>
15. Riyani, W., Sarir, Dewi Kartika, & Fatmawati, S. (2020). Application of brain gym to the level of dementia in the elderly. *Jkp. Poltekkes-Mataram. Ac. Id*. <http://jkp.poltekkes-mataram.ac.id/index.php/bnj/article/view/536>
16. Sigalingging. (2022). Characteristics of Elderly People with Memory Disorders. *Jurnal.Darmaagung.Ac.Id*. <http://jurnal.darmaagung.ac.id>.
17. SDKI DPP PPNI Working Group Team. (2017). Indonesian Nursing Diagnosis Standards. Jakarta: Central Executive Board of the Indonesian National Nurses Association.
18. SIKI DPP PPNI Working Group Team. (2017). Indonesian Nursing Intervention Standards. Jakarta: Central Executive Board of the Indonesian National Nurses Association.
19. PPNI DPP DPP SLKI Working Group Team. (2017). Indonesian Nursing Outcome Standards. Jakarta: Central Executive Board of the Indonesian National Nurses Association.
20. Tuppen, J. (2012). The benefits of groups that provide cognitive stimulation for people with dementia. *Nursing Older People*, 24(10), 20–24. <https://doi.org/10.7748/NOP2012.12.24.10.20.C9437>.
21. Yuliyanti, T., Kustanti, K., & Wahyuni, W. (2022). Efforts to Prevent Dementia With Brain Therapy Training and Basic Health Examinations in the Elderly in the Bulakrejo Village Area, Sukoharjo Regency. *GEMASSIKA: Journal of Community Service*, 6(2), 141–153. <https://doi.org/10.30787/gemassika.v6i2.692>.