

Improving Cognitive Function in Elderly with Dementia through Art Therapy and Brain Gym in Gunungpati, Semarang

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Abstract: Dementia is a condition that occurs in the elderly where they experience a decrease in the function of consciousness so that the ability to process thoughts is progressively damaged. Cognitive function is a human mental process that includes perception, attention, knowledge, thought processes, and memory, due to the aging process. Art therapy is a therapy that aims to help overcome a number of mental health disorders and psychological stress in the elderly who experience decreased cognitive function. Brain gym to reduce cognitive function due to aging and as a form of stimulation to improve brain abilities in the elderly. The purpose of this case study is to describe the application of art therapy and brain gym to improve cognitive function in the elderly with dementia in the target area of the Gunungpati Health Center, Semarang. The case study method used is descriptive with a case study approach. Subjects used were 2 women and men with dementia, aged 60-74 years, lived with family, could be invited to communicate verbally, and declined experienced cognitive function, with MMSE (Mini Mental State Examination): score 17-23 which is said to be probable cognitive impairment, and can read and write with a duration of 20-30 minutes. The results of the case study showed that Subject I experienced an increase in cognitive function from a score of 23 to 26, and Subject II from a score of 24 to 27. Application of art therapy and brain gym to improve cognitive function in the elderly with dementia is recommended as a nursing intervention in the management of family members with dementia.

Keywords: Art Therapy; Brain Gym; Cognitive Function; Dementia; Elderly

1. Introduction

The family is the smallest unit of society consisting of the head of the family and several people who gather and live in a place under one roof in a state of mutual dependence. (A, 2018) In a family, there are individuals, one of whom lives with the elderly, where family members have an important role in providing family nursing care, especially for the elderly. (CT, 2021) Elderly people are people who have reached the age of 60 years and above or a group of people who have entered the final stage of their life phase. Where those who are categorized as elderly will experience a process called the aging process. (Manafe & Berhimpon, 2022) Based on data from the Ministry of Health Republic of Indonesia in 2020 the number of elderly people in Indonesia has reached 28.8 million or 11.34% of the total population. In the year By 2025, the number of elderly people is estimated to be 733 million. (Manafe & Berhimpon, 2022) The Gunungpati area is a sub-district in Semarang City which has a population of 13,619 elderly people in 2021. (Organization, 2022a)

Based on the elderly population data that has been obtained, it can be confirmed that as the number of elderly increases, various health problems will be found. Experienced, one of which is a decline in cognitive function, where the brain as a complex organ, the center for regulating body systems and the cognitive center is one of the body's organs that is very

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vulnerable to the aging process. Or commonly called experiencing dementia . (Mewujudkan Lansia Hebat Kota Semarang, 2021) Dementia is a syndrome caused by a brain disorder that can be chronic or progressive and can slow down a person's cognitive functions, including memory, thinking, orientation, responsiveness, calculation, learning ability, language, judgment and can also affect daily activities. (Lansia, 2021) Dementia isn't a specific disease, but rather a term used to describe a group of symptoms that impair brain function, characterized by forgetfulness or senility. Experiencing memory loss doesn't necessarily mean dementia; it can range in severity from mild to severe. (Data Penduduk Lansia Kecamatan Gunungpati Kota Semarang, 2021)

As the number of elderly people experiencing cognitive decline increases, further treatment methods are needed. Current phenomena indicate that cognitive decline in the elderly has not yet received optimal treatment. (Emilia NL, Susanto D, Anggreyni M, 2022) This role of family nurses is greatly needed by elderly people experiencing cognitive decline. Family nurses can provide care by increasing the health care function involving the family, so that the family is able to independently care for elderly people experiencing cognitive decline or elderly people with dementia. (Sangadji F, 2018)

The way to improve cognitive function in the elderly must be done more easily and effectively apart from pharmacological therapy with drugs, namely providing non-pharmacological therapy which includes providing interventions included in Cognitive Rehabilitation Therapy (CRT) where one of the interventions is providing art therapy and activity therapy such as brain gymnastics or brain gym. (Siska Evi Martina, Rumondang Gultom, 2021)

Art therapy is an art therapy that can increase attention and orientation in elderly people with dementia, reduce behavioral and psychological symptoms, improve social skills and can help ease the burden on families with elderly people who experience dementia. (Musi MA, 2021) Art therapy is an effort to prevent the decline in cognitive function due to dementia and as a form of stimulation to increase brain capacity, namely by doing brain gymnastics exercises. (Organization, 2022b)

Brain gymnastics or brain gym is a type of exercise whose benefits not only improve blood and oxygen flow to the brain but can also stimulate both hemispheres of the brain to work. (Sangadji F, 2018) The reason brain gymnastics can be used as a therapy to improve cognitive function is that there are movements that aim to reactivate the neural connections between the body and the brain so that it will facilitate the flow of electromagnetic energy throughout the body. (Anurogo, 2016)

Art therapy and brain gym interventions can encourage a person's expression, through artistic expression that can understand emotions, and through the creative process, so it is hoped that it can improve cognitive and memory in the elderly. Art therapy and brain gym are carried out for 30 minutes for 2 weeks. Where in the first week, art therapy is carried out

first in the form of drawing and in the second week, brain gymnastics therapy is given or brain gym. (Widyastuti RH, Andriany M, Ulliya S, 2019)

Family involvement in accompanying sick family members in art therapy and brain gym sessions is highly supportive of the elderly, significantly reducing blood sugar levels. The presence of family members makes the elderly feel happier and more relaxed during the therapy. (Harnilawati, 2013)

The problem formulation of this case study is How to Apply Art Therapy and Brain Gym to Improve Cognitive Function in Elderly with Dementia in the Family Area of the Gunungpati Health Center in Semarang City. The purpose of this case study is to describe the Application of Art Therapy and Brain Gym to Improve Cognitive Function in Elderly with Dementia in the Family Area of the Gunungpati Health Center in Semarang City. The benefits of this case study for the community are Providing information to the community, especially aimed at the elderly and families about how to improve cognitive function in elderly with dementia by implementing art therapy interventions or art therapy and physical exercise therapy in the form of brain gymnastics or brain gym independently with the family. For the development of science and technology, namely becoming learning materials for institutions and reference materials in providing nursing actions with non-pharmacological methods through the application of art therapy or art therapy and physical exercise therapy or brain gym to improve cognitive function in elderly with dementia. For the author, this case study is a learning process, especially in the field of research methods. This case study can also be information material and increase knowledge about the benefits or effects of providing art therapy and brain gym interventions to improve cognitive function in elderly with dementia.

2. Preliminaries or Related Work or Literature Review

2.1 Family

Family refers to two or more individuals who are interdependent on each other for emotional, physical and economic support. (D. M. Putri et al., 2017) In a broad sense, family is the smallest unit in society, consisting of those who have personal and reciprocal relationships in carrying out obligations and providing mutual support due to birth, adoption or marriage. (Erwanto & Amigo, 2017)

2.2 Elderly

An elderly person is someone who has entered the age of 60 years. The elderly often experience various changes, both physical, mental and social. Physical changes include a decrease in physical strength, stamina and appearance. This is what can cause some elderly people to become depressed or feel unhappy when entering old age, they tend to be ineffective in their work and in carrying out their roles in the social environment. (D. M. P. Putri, 2019)

2.3 Cognitive Function

Cognitive is a person's belief about something that is obtained from the thinking process. Which begins with gaining knowledge through the activities of remembering, understanding, analyzing, imagining, and evaluating. Therefore, cognitive function is a human mental process that includes perception, attention, knowledge, thinking processes, and memory. (Ramayanti, 2020) Cognitive disorders are one of the problems caused by the aging process which results in impaired brain function resulting in a decrease in calculation, concentration, decision making, abstract thinking and reasoning. (Selvia David Richard, S.Kep., Ns. & Srinalesti Mahanani, S.Kep., Ns., 2021)

2.4 Dementia

According to the World Health Organization (WHO), dementia is a collection of symptoms (syndrome) due to brain disease, usually chronic (years), or progressive (gradual, slow), which results in damage to various brain functions including memory, thinking, orientation, understanding, learning capacity, calculation, judgment and language, as well as clouded consciousness. This is usually accompanied by a decline in emotional control, social behavior, or motivation. (Anurogo, 2016)

2.5 Art Therapy

Art therapy, or what is commonly called art therapy, is a technique based on the idea that creative expression can promote healing and mental well-being. Art therapy is believed to be effective for a wide range of problems, from anxiety disorders and eating disorders to emotional issues and family or relationship problems. (Deborah Siregar et al., 2020) Art therapy is a therapeutic process that uses drawing or painting as a tool for assessment and intervention. The use of drawing or painting as therapy is based on the assumption that drawing is a form of communication that rarely evokes resistance and even provides a way to express thoughts and feelings. (D. M. P. Putri, 2019)

2.6 Brain Gym

Brain gymnastics or brain gym is a series of simple movements that can balance each part of the brain, can bring out the level of brain concentration, and also as a way out of the blocked part of the brain so that it can function optimally. (Wahyuni, 2021) Brain gymnastics is gymnastics with simple movements and can be done by anyone. Brain gymnastics movements can stimulate or stimulate the brain through hand and foot exercises, in addition to being able to increase cognitive abilities such as concentration, speed, perception, alertness, learning, memory, creativity, problem solving and being able to harmonize the ability to be active and think simultaneously. (AFT, 2018)

3. Proposed Method

This research design uses a case study with a descriptive approach. The subjects of this case study consist of 2 respondents with the criteria of being willing to be subjects, elderly with a history of dementia aged 60-74 years who live with family, female and male, can be invited to communicate verbally, experience cognitive function decline with MMSE (Mini Mental State Examination): a score of 17-23 which is said to be probable cognitive impairment, and can read and write . The focus of this case study is the application of art therapy and brain gym to improve cognitive function in elderly with dementia . The instruments used are observation sheets of MMSE (Mini Mental State Examination) scores of cognitive function pre and post intervention, SOPs on art therapy (providing media such as paper and markers), SOPs on brain gym that have been determined.

The stages of data collection carried out by researchers are: taking care of Ethical Clearance tests, taking care of permits with related institutions to conduct research. researchers provide information about the intent, purpose, and time of the research to all related parties including involving the respondent's family at the research site and requesting approval to involve the subject in the research . selecting clients as respondents who will be given art therapy and brain gym according to predetermined criteria , providing an explanation to the subject about the subject's participation in this research, and if the subject agrees to participate in this research, then asked to sign the research consent form (informed consent) , interpreting the MMSE score using the predetermined MMSE score questionnaire sheet and the observation sheet of the MMSE score results as pre-test data on the first day in the first week of implementing art therapy (drawing) , implementing art therapy in the first week for 7 consecutive days with a duration of 20-30 minutes using paper and marker media , then after each application the client is given time to rest for 10 minutes. The pre-test data for the application of art therapy on the first day of the first week that has been obtained is collected on the art therapy observation sheet. In the second week, Brain Gym was implemented for seven consecutive days. The Brain Gym intervention lasted 20-30 minutes on the first day of the second week. On the first day, the researcher as the leader taught Brain Gym to the subjects and their families. The following day, the subjects performed Brain Gym independently, accompanied by the researcher, until the seventh day of implementation was completed. After each implementation, the subjects were given a 10-minute rest period, given another MMSE score sheet, and instructed to fill it in as post-test Brain Gym data. The last day of the second week. The data obtained were collected on the brain gym observation sheet , processing the data obtained , This data analysis was carried out with the aim of determining whether there was an increase in cognitive function in elderly clients with a history of dementia pre and post intervention using Art Therapy (drawing) and Brain Gym . The assessment method used the MMSE (Mini Mental State Examination) score sheet by comparing the pre and post scores of Art Therapy and Brain Gym therapy and presenting the

results of data processing or research results in the form of graphs, tables, diagrams or narratives

4. Results and Discussion

4.1 Case Study Location Overview

This case study was conducted in the Family Area of the Gunungpati Semarang Community Health Center, located in Mundingan Hamlet, RT.004/RW.002, Cepoko Village, Gunungpati District, Semarang City, Central Java. The existing health services at the Gunungpati Community Health Center do not yet offer specialized services to treat elderly people experiencing cognitive impairment. Consequently, there are no specialized health services to address dementia cases in the elderly within the Gunungpati Community Health Center's area of responsibility.

4.2 Case Study Subject Overview

In this case study, two subjects were selected, namely subject I and subject II who met the specified inclusion criteria. Subject I is 68 years old, female, Muslim, has an elementary school education, works as a housewife and farmer, lives with her husband, has an only child whose child is married and has children, where they all live together under one roof with Subject I, so that Subject I's family type is included in the extended family type or large family. Subject I said that she often feels tired and feels pain in her joints. Subject I also said that at home she raises ducks to fill her free time in her old age, and is still active in activities in her surrounding environment even though sometimes Subject I finds it a little difficult to solve problems or just make decisions quickly. Subject I said that at night she rarely goes to bed early even though her body is really tired and wants to sleep immediately. Subject I also said he had a history of hypertension since 2 years ago, and knew that the factor was a hereditary history of hypertension from both of his parents. Subject II is 74 years old, male, Muslim, his last education was elementary school, previously before retiring he worked in the private sector and now he farms and raises ducks with his wife in the rice fields. As with Subject I, Subject II lives together under one roof with his wife, children and in-laws and also grandchildren, so it is included in the extended family type. Subject II also complained of the same thing as Subject I, where he easily feels tired and has sore joints. Subject II said he has a history of lung disease since 10 years ago, although the Subject has no history of smoking. Initially, Subject II knew that he had lung disease when he often complained of shortness of breath to the point of being hospitalized. The results of the assessment of the 5 family health care functions of both subjects showed that both subjects and their families were unaware of the health problem they were experiencing, namely dementia, as evidenced by the fact that both subjects did not know what dementia was and did not know the signs and symptoms of dementia. The level of family independence of both subjects was at level III.

4.3 Case Study Implementation Overview

The researcher conducted a case study on the two respondents, namely Subject I and Subject II who had met the inclusion and exclusion criteria determined by the researcher. The application of art therapy and brain gym to improve cognitive function was carried out for 2 weeks with a duration of 20-30 minutes, for implementation starting from the first week for 7 consecutive days with the implementation of art therapy then continued in the second week for 7 consecutive days continued with the implementation of brain gym . The media used for the application of art therapy and brain gym include tables, chairs, drawing paper, and markers, as well as the MMSE (Mini Mental State Examination) Score questionnaire sheet. Before the application of art therapy and brain gym was given, the first thing that needed to be done was to find out the cognitive function score in both subjects by filling out the MMSE questionnaire sheet before the application of art therapy and brain gym, then on the last day of the application, the MMSE questionnaire sheet was filled out after the application of art therapy and brain gym to Subject I and Subject II.

4.4 Case Study Results Overview

Table 1. Results MMSE (Mini Mental State Examination) Scores of the Two Subjects before the Application of Art Therapy and Brain Gym.

Subject	Name	MMSE Score
Subject I	Mrs. R	23
Subject II	Mr. M	24

Based on Table 1, it is known that the total MMSE score in Subject I is 23 (probable cognitive impairment) and Subject II's total score is 24 (normal) but at risk of dementia. From the results of the total MMSE (Mini Mental State Examination) scores of Subject I and Subject II before the application of art therapy and brain gym, it can be said that both subjects experienced a decline in cognitive function or dementia.

After knowing the MMSE (Mini Mental State Examination) score, the two subjects began implementing art therapy in the first week for 7 consecutive days from May 17-23, 2023, at 08.00 WIB, and the implementation was carried out simultaneously at the homes of both subjects because they are a married couple. Then continued the implementation of brain gym in the second week for 7 consecutive days from May 24-30, 2023, at 08.00 WIB and the implementation was carried out simultaneously at the homes of both subjects.

The application of art therapy and brain gym is carried out for 2 weeks every 08.00 WIB, where for the first week the application of art therapy is carried out first. Art therapy itself is a non-pharmacological technique by providing opportunities for the elderly to express their feelings through drawing therapy using paper and markers, the purpose of providing art therapy is to help improve cognitive function (memory) in the elderly with dementia. Meanwhile, brain gym is a series of simple movements that can balance each part of the brain or simple body movement-based exercises that can be done anywhere and anytime, brain gym

aims to improve cognitive function (memory) and help stimulate the brain in the elderly with dementia.

Table 2. Results Score MMSE (Mini Mental State Examination) of Both Subjects Post-Implementation of Art Therapy and Brain Gym.

Subject	Name	MMSE Score
Subject I	Mrs. R	26
Subject II	Mr. M	27

Based on Table 2, it is known that the total MMSE score of Subject I was 26 and the total score of Subject II was 27. From the total MMSE (Mini Mental State Examination) scores of Subject I and Subject II after the application of art therapy and brain gym, it can be said that both subjects experienced an increase in cognitive function which can be categorized as normal.

(Mini Mental State Examination) score results from table 1.2 and table 1.2, it is known that there was an increase in cognitive function in both subjects pre and post application of art therapy and brain gym. Subject I and Subject II experienced an increase in the total MMSE score of 3 (categorized as normal).

4.5 Discussion

Based on the results of the initial assessment of the two case study subjects, it was found that Subject I was 68 years old, while Subject II was 74 years old and age is one of the factors that influences the occurrence of dementia due to damage to brain cells where the nervous system can no longer carry information into the brain, thus causing a decline in memory. Therefore, the relationship between age and dementia is that as a person's age increases, their memory also decreases. This is because the older a person is, the cognitive function in him, including his memory, also decreases. Therefore, age is closely related to the occurrence of dementia in the elderly. (Suyanti Prasuci Pamungkas, 2021)

The next factor that influences dementia is gender, data has been obtained that Subject I is female and Subject II is male. Based on research from Mardiyanto, Jahja, and Limyati in 2017, it was stated that there is no significant difference in age between men and women in maintaining cognitive function. (H, n.d.) However, this opinion is not in line with research from Sari, Ningsih, & Pratiwi, in 2018, which stated that the factors that cause dementia between the two genders found that the incidence of dementia is more common in women. (Setiawan, 2020)

Another factor that can influence the occurrence of dementia is a person's level of education. Data shows that both subjects' final education was elementary school. This suggests that elderly people with low levels of education will experience a decline in cognitive function due to a lack of thinking skills, which can lead to brain tissue death and significant cognitive decline. (Rizqi Alvian Fabanyo, 2023)

Based on the data obtained, Subject I and Subject II had a history of disease. Subject I had a history of hypertension while Subject II had a history of lung disease. A history of

disease is one of the factors that can influence the occurrence of dementia. Based on the literature on the relationship between a history of disease and dementia, an elderly person who has a history of disease tends to have a 5 times greater chance of experiencing cognitive dysfunction. (Eka Putri, 2021)

Another factor that can influence dementia is physical activity, where data from the two subjects showed that in their old age they still frequently went to the rice fields and raised ducks on a daily basis. Based on the literature, it states that physical activity can help maintain optimal blood flow and also increase the delivery of nutrients to the brain, thereby inhibiting brain tissue hypertrophy which can cause neuronal degeneration which has an impact on cognition. (N, 2022)

Subjects who are elderly often encounter problems that occur in their lives. Based on data from Subject I, he often experiences fatigue and pain in his joints. Subject II also complained of the same thing as Subject I, which is that he easily feels tired and has sore joints. This condition has an impact on function and ability to carry out daily activities, for example arthritis, reduced bone density, decreased body resistance. (Pragholapati A, Ardiana F, 2021)

Based on the results of the assessment of 5 family health care functions that both Subjects and their families did not know about the health problems experienced apart from a history of hypertension in Subject I and a history of lung disease in Subject II, regarding dementia itself they did not know as evidenced by the two Subjects not knowing what dementia is and not knowing the signs and symptoms of dementia. Guidance and coaching efforts for the family and both Subjects to achieve family independence in overcoming various health problems in the family can be done one of them through the implementation of family nursing care, where in this case Subject I and Subject II the level of family independence is at level III independence.

Art therapy and brain gym implementation given to Subject I and Subject II was carried out simultaneously in the morning in the living room of their house under the guidance of the researcher. The implementation of art therapy and brain gym was in accordance with the SOP determined by the researcher and the implementation time was for 2 weeks, where for 7 days in the first week the art therapy was implemented and the next 7 days in the second week continued with the implementation of brain gym.

Art therapies that can be done is drawing, where the activity of drawing is beneficial and can create feelings of interest and enjoyment in individuals, and can also stimulate participation in dementia sufferers. (D. M. P. Putri, 2019) brain gym therapy aims to. This improves blood flow, increasing oxygen supply to the brain, and improving overall fitness and brain health. Furthermore, it's beneficial for maintaining thinking, memory, and responsiveness. The benefits of brain exercises are maximized when performed regularly,

improving condition and activating the brain's alertness center. (Suyanti Prasuci Pamungkas, 2021)

The various benefits of art therapy and brain gym are recommended for both subjects to incorporate into their daily activities. During the art therapy and brain gym sessions, both subjects expressed joy and satisfaction, and were always cooperative during the therapy.

5. Conclusions and Suggestions

5.1 Conclusion

The MMSE (Mini Mental State Examination) score results of Subject I before the application of art therapy and brain gym were 23 (probable cognitive impairment) and the MMSE score results after the application were 26 (normal). From the MMSE score data obtained, it can be said that Subject I experienced an increase in cognitive function as evidenced by the total MMSE score increasing by 3. The MMSE (Mini Mental State Examination) score results of Subject II before the application of art therapy and brain gym were 24 (normal) at risk of experiencing dementia and the MMSE score results after the application were 27 (normal). From the MMSE score data obtained, it can be said that Subject II experienced an increase in cognitive function as evidenced by the total MMSE score increasing by 3.

5.2 Suggestion

5.2.1 For the Community

The art therapy and brain gym sessions taught can be applied independently in daily activities at home. Families are also expected to actively participate in caring for family members experiencing cognitive decline or dementia by continuously creating a safe and comfortable home environment and ensuring that the elderly's belongings are placed within easy reach.

5.2.2 For the Development of Nursing Science and Nursing Technology

Community health center nurses can use the application of art therapy and brain gym as a reference for non-pharmacological therapy to help improve cognitive function in elderly people with dementia. Art therapy and brain gym are one of the nursing interventions in managing families with dementia. It is hoped that the Gunungpati Community Health Center can reactivate the Elderly Integrated Service Post (Posyandu Lansia) specifically to treat elderly people with dementia so that the application of art therapy and brain gym can be provided to the elderly community.

5.2.3 For Writers

It is hoped that the next author who will conduct a case study with the application of art therapy and brain gym will be able to maximize the teaching of art therapy and brain gym procedures, especially in helping to control cognitive function in the elderly with dementia.

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