

CHAPTER II

THEORETICAL OVERVIEW

A. The Concept of the Elderly

1. Definition of Elderly

An elderly person is someone who has entered the age of 60 years and above. The elderly are an age group in humans who have entered the final stages of their life phase. This group categorized as the elderly will have a process called *Aging Process* or the aging process (Hanafi et al., 2022).

According to Law No. 13 of 1998 concerning the crime of the elderly, the elderly is someone who has reached the age of over 60 years. Aging is a natural process which means that a person has gone through the stages of his life, namely neonates, toddlers, pre-school, school, adolescence, adulthood, and becoming elderly. These different stages begin both biologically and psychologically. Aging is a condition that occurs in human life. Aging is a lifelong process, not only starting from a certain time, but starting from the beginning of life (Johantoro, 2024).

2. Classification of the elderly

The elderly can be classified into several groups, including the following:

- a. According to WHO (2020), the elderly are defined as four age groups:
 - 1) *Middle age* : 45-59 years old
 - 2) *Elderly* : 60-74 years old
 - 3) *Elderly* : 75-90 years old
 - 4) *Very Old* : over 90 years old
- b. According to Law No. 13 of 1998, the age limit is the age that has entered 60 years and above.
- c. According to the Ministry of Health of the Republic of Indonesia in 2023, dividing the elderly into

Three categories are based on the physical, mental, and social conditions of the elderly. The categories are as follows:

- 1) Pre-Elderly Elderly, namely the elderly between the ages of 60-69 years.
- 2) Elderly Elderly, namely the elderly between the ages of 70-79 years.
- 3) Elderly Seniors, namely the elderly who are 80 years old and above.

3. Types of Elderly

Several types of elderly people depend on their characteristics, life experiences, environment, physical, mental, social, and economic conditions (Johantoro, 2024). These types can be described as follows:

a. The Wise Type

Work with wisdom, experience, adapt to the changing times, be busy, be friendly, humble, moderate, generous, fulfill invitations and be a role model.

b. Standalone type

Replace lost activities with new ones, be selective in finding a job, hang out with friends, and fulfill invitations.

c. Dissatisfied type

Innate conflicts challenge the aging process so that they become grumpy, impatient, irritable, difficult to serve, critical, and demanding.

d. Types of resignation

Accept and wait for good fortune, participate in religious activities and do any work.

e. Confused type

Loss of personality, self-isolation, indifference, regret, passivity, and indifference. Other types of the elderly are the optimistic type, the constructive type, and the dependent type. The defensive type (defensive), the militant and serious type, the anger/frustration type (disappointed by failure to do something), and the despair type (hatred of yourself).

4. Changes That Occur in the Elderly

The changes that occur in the elderly are an inevitable process that takes place continuously and continuously that further leads to physical and functional changes, mental changes, psychosocial changes, spiritual development, and the effects of regression (Palaka et al., 2024).

Changes that occur in the elderly include:

a. Physical Changes

With age, it is natural that the condition and function of the body decrease. No wonder in the elderly, more and more complaints are raised because the body no longer wants to work together as well as when they were young. Getting old brings about a whole physical, social, mental, and moral change of life, all of which are interrelated between one part and another. In general, aging is characterized by biological deterioration that is seen as a symptom of physical deterioration, including: the skin begins to sag and the face begins to wrinkle and lines that settle, head hair begins to whiten or gray, teeth begin to fall out, vision decreases, fatigue and fall easily, prone to disease, decreased appetite, decreased smell, slow movements, lack of agility, and sleep patterns change (Palaka et al., 2024).

b. Mental Changes

In the mental or psychological field in the elderly, changes can be in the form of an attitude that is increasingly egocentric, easily suspicious, more stingy or greedy when owning something, what needs to be understood is the general attitude found in almost every elderly person, namely the desire to live a long life, to save their energy as much as possible, expecting to continue to be given a role in society, wanting to maintain their rights and property and wanting to remain authoritative, Die honorably and enter the surge (Palaka et al., 2024).

c. Memories (memories)

Long-term memories, a few hours to a few days ago and include some changes, short-term memories or a 10-minute scale), bad memories can go towards dementia.

d. *Intelegantia Quotion (IQ)*

IQ does not change with mathematical information and verbal speech. Appearance, perception and psychomotor skills are reduced. There is a change in the power of imagining due to the pressure of the time factor.

e. Psychosocial Changes

Psychosocial changes in the elderly are often measured by their value through their productivity associated with roles in work. When experiencing retirement (retirement), a person will experience losses, among others: financial loss (reduced income), loss of status, loss of friends, loss of job and activities so that they feel aware of death, economic shortcomings, diseases arising from loneliness, nervous and sensory disorders, nutritional disorders, a series of loss of strength and physical strength (Palaka et al., 2024).

f. Impact of Setbacks

Entering old age, there are many setbacks, for example, physical deterioration which is characterized by wrinkled skin due to reduced fat cushioning, bleached hair, reduced hearing, deteriorating vision, teeth starting to fall out, activity slows, reduced appetite which causes malnutrition in the elderly and other body conditions also experience setbacks, changes in living conditions can have a bad impact on the elderly. Coping with the loss of a partner, moving residence, social isolation, and loss of control can make it difficult for the elderly to take care of themselves (Palaka et al., 2024).

B. Cognitive Concepts

1) Cognitive Definitions

Cognitive comes from the Latin language which is *cognitio* which means thinking. It refers to a person's ability to understand his or her world, which is achieved from a number of complex functions including orientation to time, place and individuality, arithmetic ability, abstract thinking, focused ability to think (Nur Fitra et al., 2025).

2) Definition of Cognitive Function

Cognitive function is the ability to think and provide rationality, including the process of learning, remembering, assessing, orienting, perceiving and paying attention. Cognitive function is defined as a process in which all sensory inputs (tactile, visual and auditory) will be changed, processed, stored which are then used for the perfect interneuron relationship so that individuals can reason with these sensory inputs. Cognitive function is related to the quality of knowledge a person has. Aspects of cognitive function include orientation, language, attention, immediate recall, memory concentration, construction functions, calculation and reasoning (Dewi and Nardina, 2024).

3) Factors Affecting Cognitive Function Disorders

The factors that affect cognitive function disorders are:

a. Age

As a person ages, there will be more changes to various systems in the body that tend to lead to a decrease in function. In cognitive function, there is a decrease in intellectual functioning, a decrease in the ability to transmit nerves in the brain which causes the information process to be slow, a lot of information is lost during transmission, a decrease in the ability to accumulate new information and retrieve information from memory.

b. Gender

Gender also affects cognitive function in the elderly. Women tend to have a greater risk of cognitive impairment than men. This is due to a decrease in the hormone estrogen in menopausal women, so the risk of neurodegenerative diseases increases, because this hormone plays an important role in maintaining brain function.

c. Education Level

Education is a process of adding life experience which is also an

intellectual stimulation process that will affect a person's cognition. A low level of education means less mental and environmental experience which has an impact on less intellectual stimulation. Thus, resulting in poor cognitive of a person.

d. Disease History

The history of diseases experienced in the elderly has an impact on cognitive function, namely disorders with the nervous system, for example in stroke, dementia, and Alzheimer's disease which results in damage to brain cells so that it causes impaired sensory, mobility and cognitive functions (Dewi and Nardina, 2024).

4) Symptoms of Impaired Cognitive Function in the Elderly

Symptoms of impaired cognitive function in the elderly are:

- a. Disorientation, is a change in the condition of the symptoms of cognitive function disorders that make the elderly confused or unfamiliar with the location and time of the situation
- b. Memory difficulties in conveying and storing information
- c. Difficulty concentrating
- d. Frequent repetition of words
- e. Quick to anger and unruly
- f. Difficulty being cooperative when invited to communicate
- g. Weak in following the instructions given and Loss of numeracy skills.

5) Impact of Cognitive Impairment

The impact of cognitive impairment that occurs in the elderly includes:

- a. Memory is the most influential impact of cognitive impairment due to cell changes experienced by the elderly due to degenerative processes, where there are genetic changes that result in a decrease in beta amyloid protein in extracellular neuron cells and protein abnormalities in intraneurons so that nerve impulses to the brain are disrupted. In the elderly, the brain also experiences atrophy where the brain weight will decrease by 5-10%, the number of neurons and neurotransmitters also decreases so that cells and brains cannot transmit and store information.

- b. *IQ (Intellectual Quotient)* has decreased from the impact of cognitive impairment on the elderly in terms of perception, decrease in memory and speed of giving unfocused responses.
- c. Learning ability has decreased due to the impact of declining cognitive function, this encourages the elderly to train their cognitive skills a lot in improving learning skills even though it takes time. So that the elderly are given the opportunity to learn new things related to the process that has been adjusted to the conditions of each elderly.
- d. The ability to *comprehension* in the elderly has decreased in understanding something, this can occur due to a decrease in concentration, hearing and memory that begin to decline.
- e. *Problem solving* in the elderly decreases in terms of problem solving along with the decline in cognitive function and sensory function so that the problem-solving process runs slowly.
- f. Decision *making* in the elderly is so slow due to the impact of declining cognitive function.
- g. Wisdom (*Wisdom*) which is a reflection of the nature and attitude of the elderly in considering between good and bad so that they can act wisely (Martina et al., 2024).

6) Aspect-Aspect Cognitive

There are five cognitive aspects according to (Martina et al., 2024).i.e. time orientation and place orientation, registration, attention and calculation, recall (*Recall*), and language. The following is an explanation of the five cognitive aspects:

- a. Orientation is an assessment of the past place and time. Time orientation is assessed by asking for the year, season, date, day and month with a maximum value of five. Meanwhile, the orientation of the place is by asking the country, province, city, PSTW and the room. The cognitive aspect of time and place orientation with a maximum value of ten.
- b. Registration is an assessment of the speed of speech in object recognition by asking the elderly to name three objects in one second

designated by the examiner such as chairs, tables and papers. The cognitive aspect of registration with a maximum score of three.

- c. Attention and calculation is an assessment of the counting process in the elderly by asking the elderly to start from one hundred and then subtract seven to five times. Cognitive aspects of attention and calculation with a maximum score of five.
- d. Recalling is an assessment of the elderly in recalling by asking the elderly to repeat the three objects on the registration number (chair, table and paper) of the cognitive aspect of recall (*recalll*) with a maximum value of three.
- e. Language is an assessment of language in the elderly by showing the elderly objects such as watches and pencils, then asking the elderly to repeat the sentence "Without if and or but", asking the elderly to follow commands such as taking a paper with the right hand folded twice and placing it on the floor, asking the elderly to close their eyes, asking the elderly to write a sentence and asking the elderly to copy a picture in the form of a hexagon. The cognitive aspect of language is a maximum value of nine.

7) Levels of Impaired Cognitive Function

According to Na'imah et al., (2024), The Global Deterioration Scale follows the form of the level of cognitive impairment and its symptoms:

- a. No cognitive impairment
 - 1) No subjective complaints of memory deficit
 - 2) No memory deficit at clinical interviews
- b. Very mild cognitive impairment
 - 1) Forgetting where to put things
 - 2) No one has ever known each other well.
 - 3) There was no real evidence of memory deficits in clinical interviews
There was no objective memory deficit in work and social situations.
 - 4) Matches the symptomatological state

c. Mild cognitive impairment

- 1) Patients get lost while traveling to lesser-known areas.
- 2) His close people began to know that the patient's performance was relatively poor.
- 3) The deficit in word and name invention is starting to become apparent.
- 4) The patient reads a passage or a book but only remembers a small part.
- 5) Patients show a decrease in the ability to remember names, when introduced to new people.
- 6) The patient loses or misplaces valuables.
- 7) Concentration deficits begin to be apparent when clinical tests are carried out .
- 8) Real evidence of memory deficits was only seen in intensive interviews.
- 9) Decreased performance in job demands and social conditions.
- 10) Symptoms of neglect begin to appear in patients Mild to moderate anxiety accompany symptoms (Na'imah et al., 2024).

d. Moderate cognitive impairment

- 1) Decreased knowledge of common and new problems.
- 2) Shows some deficit A memory of a person's history.
- 3) Shows concentration deficits on serial reduction tests.
- 4) Decreased ability to travel and in managing finances.
- 5) Disorientation of time and people, reacquainting previously known people and faces. Ability to travel in familiar places.
- 6) Unable to perform complex tasks. Symptoms of neglect are the dominant mechanism.
- 7) There is a horizontal affectation and avoidance of opposing situations (Na'imah et al., 2024).

e. Moderate to severe cognitive impairment

- 1) Patients cannot survive without some help.
- 2) In the interview the patient is unable to remember a relevant aspect of his life in general, there is often a disorientation of time or place.
- 3) An educated person has difficulty counting down the number 40 with the number 4 or starting with the number 20 with the number 2.
- 4) People at this stage still have a lot of knowledge about themselves and others. They always know their own names and usually know the names of their wives and children. They don't need help going to the toilet and eating, but can have trouble choosing suitable clothes (Na'imah et al., 2024).

f. Severe cognitive impairment

According to Na'imah et al., (2024) Severe cognitive impairment is:

- 1) Sometimes he forgets the name of his wife who is the basis of his life.
- 2) Unaware of all the new events and experiences of his life. They still have knowledge of their past lives, but this is very planned. Generally unaware of the environment, year, seasons and so on.
- 3) Exploring the difficulty of counting from the number 10 backwards and sometimes forwards.
- 4) Requires some help for daily life activities, for example becoming an intruder.
- 5) Need help to travel and visit family places. Often disturbed by diurnal problems.
- 6) Almost always recalling one's own name. Often continues the ability to distinguish between known and unknown people in his environment.
- 7) There are personality and emotional changes. This includes, among others:
 - a) Delusional behavior

- b) Symptoms of obsession
 - c) Symptoms of anxiety, agitation, and even violent behavior can arise that were not there before.
- g. Very severe cognitive impairment
 - 1) All verbal abilities are lost. Initially, words and phrases were spoken, but speech was very limited. Furthermore, there is no ability to speak.
 - 2) Incontinence occurs, requiring help to the toilet and eating
 - 3) Loss of basic psychomotor skills in progressive continuation such as the ability to walk.
 - 4) The brain is no longer able to give the body the task of doing something
- 8) Concept of Cognitive Impairment in the Elderly

Cognitive impairment in the elderly is a condition in which the brain's ability to receive, process, store, and output information decreases faster than normal aging, affecting various cognitive domains such as memory, attention, language, executive function, and the ability to perform daily activities. The range of this disorder can vary from *mild cognitive impairment* (MCI).

MCI is a transitional phase that if left untreated can develop into dementia over time. This decline is influenced by a variety of risk factors including old age, chronic diseases such as diabetes mellitus and hypertension, lifestyle, as well as neurological conditions, all of which accelerate nerve cell damage and disrupt brain plasticity. Early detection efforts and a comprehensive approach are important in preventing the progression of cognitive impairment, especially through nonpharmacological interventions such as cognitive stimulation and structured mental activities Na'imah et al., (2024).

9) Measurement of Cognitive Function with MMSE

a. Definition

Mini Mental Status Examination (MMSE) is a test used to assess

cognitive decline in the elderly as they get older and evaluate their mental state and determine further interventions in the elderly. Inspection *Mini Mental Status Examination* (MMSE) is designed for seniors who have experienced cognitive or mental decline and live in communities, institutions or with family (Okvitasari et al, 2024).

b. MMSE Measurement

MMSE measurements adopted from research Okvitasari et al., (2024). *Mini Mental State Examination* (MMSE) was used to measure the cognitive function of the elderly consisting of 11 questions about: time orientation, place orientation, registration, calculation and attention, remembering, language (naming objects, word repetition, three-step commands, closing eyes commands, sentence writing commands, image copying commands/visuospatial abilities). The maximum score is 30 (thirty). The interpretation of the MMSE measurement is that if a score of 27-30 points means that there is normal or no impairment of cognitive function (*normal cognitive function*), mild cognitive impairment (*mild cognitive function impairment*) if the score obtained is 21-26 points, moderate cognitive impairment (*moderate cognitive function impairment*) with a score of 11-20 points, and severe cognitive impairment (*severe cognitive function impairment*) with a score of 0-10 points (Okvitasari et al., 2024).

C. Brain Gym Concept

1. Define Brain Gym

Brain Gym Brain gymnastics is a series of light, structured physical movements that aim to stimulate brain activity as well as maintain cognitive functions, such as memory, concentration, and thinking ability. The movements in brain gymnastics are designed to be easy for the elderly to do, without requiring large amounts of energy or high physical ability. Through these simple exercises, brain exercises help improve coordination between body and mind, as well as smooth the flow of blood and oxygen to the brain, which is important for slowing down the decline in cognitive

function due to the aging process (Alviana, 2024).

For the elderly, brain exercises also play a role in maintaining emotional balance and reducing the risk of stress, depression, and anxiety that often arise in old age. In addition, these activities encourage social engagement when done in groups, which contributes to the overall quality of life. By regularly doing *Brain Gym*, the elderly can maintain their independence for longer, maintain clarity of thinking, and increase confidence and enthusiasm in living daily life (Sulfi et al., 2025).

2. *Brain Gym's Purpose*

The purpose of brain gymnastics is to increase confidence, strengthen learning motivation, stimulate the left and right brains, relax the brain and can improve cognitive function. Brain gymnastics can improve learning skills using the whole brain, which makes the brain function more effectively in the elderly and improves blood flow and oxygen to the brain (Sherli et al., 2024).

3. *Benefits of Brain Gym*

According to Faleri (2024), there are several benefits of brain exercise, which are as follows:

- a. Improves concentration.
- b. Reduces stress.
- c. Improves memory.
- d. Be able to think faster.
- e. For students, they can capture the lesson well.
- f. It can increase confidence.
- g. Fights aging.
- h. Increase happiness.

4. *Indications and Contraindications of Brain Gym*

a. *Indications of Brain Gym*

- 1) Elderly people who are still used to moving
- 2) Elderly with balance disorders
- 3) Elderly with decreased concentration, impaired thought processes,

and decreased memory ability (Triyulianti and Ayuningtyas, 2022).

b. Contraindications of *Brain Gym*

- 1) Elderly with stroke
- 2) Elderly who suffer from bedridden
- 3) Elderly with total paralysis (Triyulianti and Ayuningtyas, 2022).

5. How to Perform *Brain Gym Therapy*

According to (Sularyo and Handryastuti, 2022), *Brain Gym* movements include:

a. Lateral Dimensions

The human body is divided into left and right hands. This allows, for example, to integrate both sides of the body (bilateral integration), with the dominant one. Failure to display the center line results in what is known as learning disability or dyslexia. This dimensional movement aims to stimulate coordination and bilateral integration of the two hemispheres of the brain.

Some examples of laterality dimensional movements are:

1) *Cross Craw*

Cross-movement activates both sides of the brain and is a warm-up movement for all skills that require crossing the lateral midline (away from the body axis).

2) *8 Sleep*

This movement integrates the left and right visual fields promoting the integration of the left and right hemispheres, improving the balance and coordination of the various parts.

3) *Putaran leher (Neck Rolls)*

Neck rotation supports the relaxation of the nape of the neck, transmits the visual midline and reduces the tension caused by working in the midsection. These movements simultaneously improve visual and auditory abilities.

b. Focusing Dimensions

Concentration is the ability to cross the midline, which separates the

back and front of the body as well as the back (occipital lobe) and the front (frontal lobe) of the brain. Imperfect reflex development in the midline leads to an inability to concentrate (lack of concentration), poor comprehension, slow speech, and hyperactivity. Others are over-concentrating and trying too hard. In this dimension, pre- and post-integration activities are exercises to overcome lack of concentration.

Some examples of movements that improve concentration are:

1) Burung hantu (*the owl*).

The owl's movements imply the ability to move its head and eyes simultaneously, a wide field of view that can rotate 180° and radar-like hearing. The owl's movements imply vision, hearing and the ability to turn. This movement can relieve neck and shoulder tension due to stress.

2) Lambaian kaki (*the footflex*)

When fear or stress is experienced, the calf tendon contracts stiffly in preparation for a 'fight or flight response'. Leg swing and calf pump exercises are re-educational processes that restore the natural length of the tendons in the legs and lower legs. These exercises are beneficial exercises to release the brain's 'language' and help with conversation and self-expression. These exercises improve communication skills, allow for more creative writing and make work easier.

c. Concentration dementia

Concentration is the ability to cross the boundaries between the upper and lower bodies, which connects the functions of the upper and lower brains: the limbic system (midbrain), which deals with emotional information, and the cerebellum, which controls abstract thinking. Failure to maintain focus can lead to unfounded fears, a tendency to react against or flee, and an inability to feel and express emotions. This dimension of movement helps to relax the body's system and harmonize its ability to process information without being affected by negative

emotions. Centering movements include:

1) Energetic Yawning (Energetic yawning)

Yawning is a natural breathing reflex that increases blood circulation to the brain and stimulates the entire body. Yawning balances the skull and reduces tension in the head and jaw by touching the tense jaw area. Yawning activates the brain, improves the sensory and motor function of the eyes, and strengthens the muscles for speaking and chewing.

2) Pijat kuping (*the thinking*)

This activity awakens the mechanisms of hearing and memory. It improves hearing ability, short-term memory and abstract thinking. Slowly open the earlobe outward, from top to bottom, three times.

6. The Effect of *Brain Gym* on Improved Cognitive Function

Brain gymnastics is one of the choices of physical activity to stimulate the brain. Brain exercises are performed with simple movements using hands and feet. Each part of the brain can be balanced by regularly performing brain gymnastics movements, then it can increase brain concentration and create pathways for the blocked parts of the brain to be able to perform their functions optimally. Improvement of cognitive function then prevents the complete deterioration of intellectual, cognitive and emotional functions obtained from stimulation obtained from brain gymnastics movements (Alviana, 2024).

According to Karauwan and Kerangan, (2024) It is known that at the time of research, some respondents experienced improved memory, shown by respondents being able to answer questions about dates, months, and years correctly. It can be concluded that brain exercises can improve the cognitive function of the elderly.

The research of Hasanah et al (2021) conducted on 7 elderly people who experienced a decline in cognitive function for 2 weeks, the conclusion from the statistical test was that there was an influence of brain gymnastics on the improvement of cognitive function in the elderly Paired Samples T-

Test obtained p value =0.000 ($p < 0.05$) so that H_0 (Hypothesis Zero) was rejected means that there is a significant influence between brain exercises on the improvement of cognitive function in the elderly (Hasanah et al., 2021).

The research conducted by Widari et al, (2022) which provided brain gymnastics therapy for 4 times in 2 weeks to 30 respondents, it is known that the results of the study after brain gymnastics were carried out by respondents who experienced an improvement in cognitive function to normal 5 people (33%), light 7 people (54%) moderate 1 person (4%) weight 2 people (9%) then from the pre and post insomnia data of the respondents were analyzed using the Wilcoxon test through computerization with a degree of significance $p < 0.05$, and a significance level of $p = 0.032$ was obtained, then H_0 was rejected and H_1 was accepted, where the conclusion means that there is an influence before and after brain gymnastics with cognitive function of the elderly cognitive function in Medokan Asri Barat Housing RW VI Surabaya (Widari et al., 2022).

Based on the research of Alviana, (2024) the results obtained that before and after brain exercises were carried out (*Brain Gym*) there was a difference in the value of cognitive function in the elderly at Posyandu Reksogati in the intervention group. In general, the research resulted in a finding that there was a significant difference in respondents who did not receive gymnastics treatment *brain (Brain Gym)* And, respondents who received brain gymnastics in the cognitive function score treatment against respondents, where an increase in cognitive function occurred in the group that received brain exercises, while there were only 2 people who experienced a 1 score increase for their cognitive function in the group that did not receive brain exercises (Alviana, 2024).

D. Puzzle Therapy Concept

1. Definition of *Puzzle Games*

Games *Puzzle* is one of the games that is useful for honing and improving brain power and problem-solving skills. This game has several

stages that are passed so that it can complete a pattern or image (Herison et al., 2024). The puzzle challenges players to piece together an image, drawing, or whole piece. These objects often have irregular shapes and must be arranged to produce a suitable image. In addition to requiring full concentration, playing *Puzzle* It also requires the patience and imagination of its players (Prahasasgita and Lestari, 2023).

There are many different types of puzzles that have different systems, but one purpose. This game has the purpose of training competition as well as the ability to think creatively to find solutions to the problems faced. This type of game is widely used to train thinking and analyzing skills (Martina dkk, 2025).

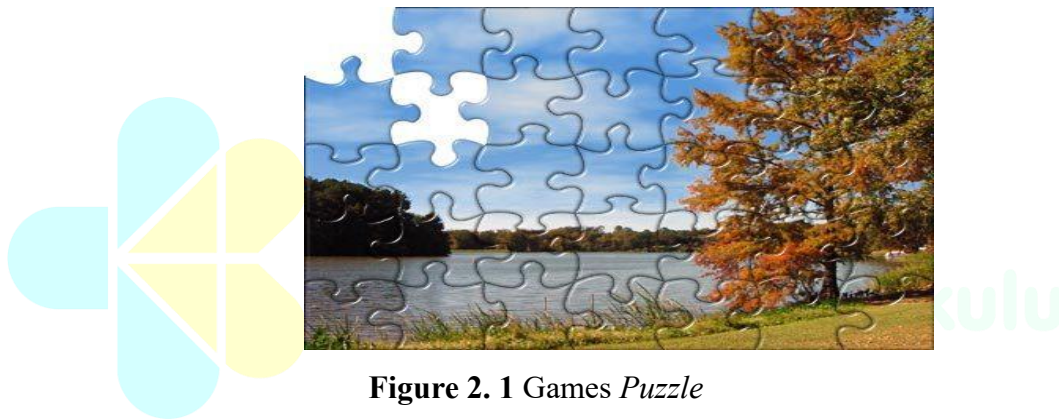


Figure 2. 1 Games *Puzzle*

Source: (Parapuan, 2022)

2. Benefits of *Puzzle games*

According to Aswatun Hasna (2021), there are various benefits felt from competitive sports, including:

a. Cognitive skills can improve

This type of game is closely related to the ability to solve problems that involve stimulating the brain so that it performs an action such as thinking, visualization, and analysis. These activities have a good impact on improving cognitive skills.

b. Improve fine motor skills

Competitive sports require good finger and hand motor skills, which can improve hand-eye coordination, fine motor skills, and good hand

grip. It can also be used in planning and drawing.

c. Improved interpersonal skills

There are some *puzzle* games that require a lot of people to play them so that it helps improve interpersonal relationships. Players learn to communicate, work together, and help each other to find solutions to the problems they face.

d. Increased confidence

Puzzles are useful for improving problem-solving skills so that the desired goal is achieved. Thus, after completing the challenge has an impact on increasing the person's confidence and self-esteem.

e. Increased understanding of space concepts

Puzzles allow someone who plays them to better explore the concept of space with various aspects represented through the arrangement of *puzzle pieces* according to shapes.

f. Train focus and concentration

Activities require a person to be careful and focused so that they can solve the *puzzle*. Thus, a person's ability to focus can be improved so that it is useful in improving achievement in other subjects.

g. Emotion regulation

A person who plays games indirectly controls their emotions so that they can focus more and limit the search for solutions.

3. Types of *Puzzle Games*

As explained by Adriani et al (2021), there are several types of *Puzzle* games, including:

a. *Jigsaw Puzzle*

Jigsaw Puzzle is a *puzzle* game with small parts arranged to produce a whole picture. This type of *puzzle* uses unique and complex images.

b. *Crossword Puzzle*

Crossword Puzzle is a type of puzzle in which the blank squares are filled with words that match clues based on their meaning. Common terms used in crossword puzzles include general knowledge or specific

words.

c. Sudoku

Sudoku is a type of *puzzle* that consists of squares containing the numbers 1 to 9. Each number must be placed in a box with the rule that no number is the same in a row or rows.

d. *Rubik's Cube*

Rubik's Cube is a type of *3D puzzle* with 26 pieces to form a single color part. The goal of the game is to match the colored pieces by arranging them.

e. *Maze*

Maze is a *puzzle* with winding paths that form a line. The goal of the game is to find a way out of the quest.

f. Tangram

Tangram is a type of *puzzle* with seven geometric shapes so that it creates a perfect image. A flat structure includes two isosceles triangles, one isosceles triangle, two isosceles triangles, one rectangle, and one parallelogram.

g. *Brain Teaser*

Brain teaser is a puzzle game designed to test a person's abilities and imagination. These challenges are usually not difficult, but they require understanding or knowledge to complete them.

4. Indications and Cons of Indications

a. Indications for *Puzzle Therapy*

- 1) Individuals with cognitive impairments such as dementia, Alzheimer's, or stroke.
- 2) Individuals with motor disorders such as brain injury or Parkinson's.
- 3) Individuals who experience stress or anxiety.
- 4) Individuals who want to improve cognitive and motor skills (Sijabat et al., 2023).

b. Contraindications of Puzzel Therapy

- 1) Individuals with significant vision or hearing impairment.
 - 2) Individuals who experience severe pain or discomfort.
 - 3) Individuals who have a medical condition that prevents active participation (Sijabat et al., 2023).
5. How to perform Puzzle Therapy
- a. Prepare *the* selected Puzzle
 - b. Help the elderly if needed to start *the Puzzle*
 - c. Encourage seniors to work independently, providing direction and support when needed
 - d. Pay attention to the time spent completing *the Puzzle*.
 - e. Record patient progress and changes in cognitive and motor abilities (Deesirene et al, 2024).
6. The Effect of *Puzzle* Therapy on Improving Cognitive Function

Puzzle Therapy is a form of non-pharmacological cognitive stimulation that has been proven to be beneficial for the elderly in maintaining and improving brain function. These activities involve games that challenge thinking skills, such as drawing a picture, crossword puzzles, or Sudoku. Through these activities, the elderly can train memory, concentration, logic, and problem-solving skills. This stimulation is important because as we age, cognitive functions such as memory and thinking speed tend to decline. By actively engaging the brain in a structured way, *Puzzle* therapy helps slow down the process of cognitive decline (Delvia Padatu and Manda, 2023).

In addition to cognitive benefits, *Puzzle* therapy also has a positive impact on the emotional condition of the elderly. When the elderly manage to complete *Puzzle*, they feel satisfaction and increased self-confidence. This contributes to mental well-being and reduces the risk of stress or mild depression that is often experienced in the elderly. Overall, the *Puzzle* therapy can be a simple, inexpensive, and fun method in maintaining brain health and quality of life for the elderly (Herison et al., 2024).

The research conducted by Damayanti, et al (2023) which was

followed by 20 respondents and given therapy for 2 weeks, concluded from the paired T test, a value of $p=0.000$ with $\alpha=0.05$ was obtained, meaning that there was a significant influence of therapy *Puzzle* to improve memory in the elderly (Damayanti et al., 2023). The research conducted by Delvia and Manda, (2023) which was attended by 30 respondents and given therapy for 2 weeks, was concluded from the Wilcoxon statistical test, obtained a value of $p=0.000$ with $\alpha=0.05$ so that the p value of $<\alpha$ then H_a was accepted and H_o was rejected, meaning that there was an effect of therapy *Puzzle* on the improvement of cognitive function in the elderly at the Dahlia Health Center, Mariso District, Makassar City, so it is recommended to use therapy *Puzzle* to improve cognitive function in the elderly (Delvia Padatu and Manda, 2023).

Pitayani's research, (2023) which was followed by 25 respondents and given therapy for 2 weeks, concluded that the Parametric Test obtained results $p\text{-value } 0.000$ ($p \leq 0.05$) means that the game *Puzzle* Effective in improving cognitive function in the elderly (Asrina Pitayanti and Faqih Nafiul Umam, 2023). The results of the research by Isnaini and Komsin, (2020) which were followed by 36 respondents and given therapy 5 times, were concluded from the results of the Mann Whitney test in the study obtained an Asymp.Sig value (Sig 2-tailed) of $0.000 < 0.05$, meaning that there is an effect of therapy *Puzzle* Cognitive Function of the Elderly at the Sudagaran Banyumas Elderly Social Service Home (PPSLU) (Isnaini and Komsin, 2020).

E. Memory Training Concept

1. Definition of Memory Training

Memory training It is a practical exercise designed to assist the elderly in improving the ability to recall newly received information. Not only the ability to remember, *memory training* It is also useful for increasing concentration, creativity, training the elderly to think positively, and not giving up easily. The elderly who experience a decline in cognitive

function are caused by a lack of concentration and stimulation, so it will affect the memories stored in the brain. When a piece of information received by the senses is not heeded, sooner or later it will be lost and damaged (Pramudaningsih and Ambarwati, 2020).

Memory training It is used to improve memory abilities by teaching mnemonic techniques. Mnemonic is a strategy or technique learned to help memory performance that can be optimized with practice. Mnemonic strategies can help memorize easily and effectively. The mnemonic technique can improve cognitive function because the mnemonic technique manipulates the learning process easily using the principles of short/long-term memory encoding so that it can make it easier to store learning information into short/long term memory (Pramudaningsih and Ambarwati, 2020).

2. The Effect of *Memory Training* on Cognitive Function

Memory training can improve the information processing systems of older adults, in order to maintain their cognitive function for active aging. Training changes the way individuals process information, allowing them to make more flexible use of their own resources. Mnemonic techniques can improve cognitive function because mnemonic techniques manipulate the learning process easily using the principles of short/long-term memory encoding so that it can be easier to store learning information into short/long term memory (Stuart, 2025).

The mnemonic technique is a strategy that functions to maximize the memory process. Forgetting is caused by two things, namely encoding failure and retrieval failure. Encoding and retrieval failures can be overcome by maximizing the encoding process in accordance with the principles of memory encoding which include meaning, association, imagination, organization and repetition (Stuart, 2025).

Research conducted by Ani et al, (2020) showed the results of statistical tests of cognitive function in the elderly before and after being given *memory training* in the intervention and control groups, a p-value of

$0.001 < 0.05$ was obtained, so it can be said that there is a significant influence of *memory training* on cognitive function in the elderly which was carried out 4 times for 2 weeks in Candirejo Village, West Ungaran District, Semarang Regency.

Research conducted Prayoga and Puspitosari, (2024) showing the results of statistical tests of cognitive function in the elderly before and after administration *memory training* in the intervention and control groups, the *p-value* $0.001 < 0.05$ so it can be said that there is a significant influence *memory training* on cognitive function in the elderly which was carried out 4 times for 2 weeks at the Aisyiyah Sumber Solo Nursing Home (Prayoga and Puspitosari, 2024).



F. Theoretical Framework

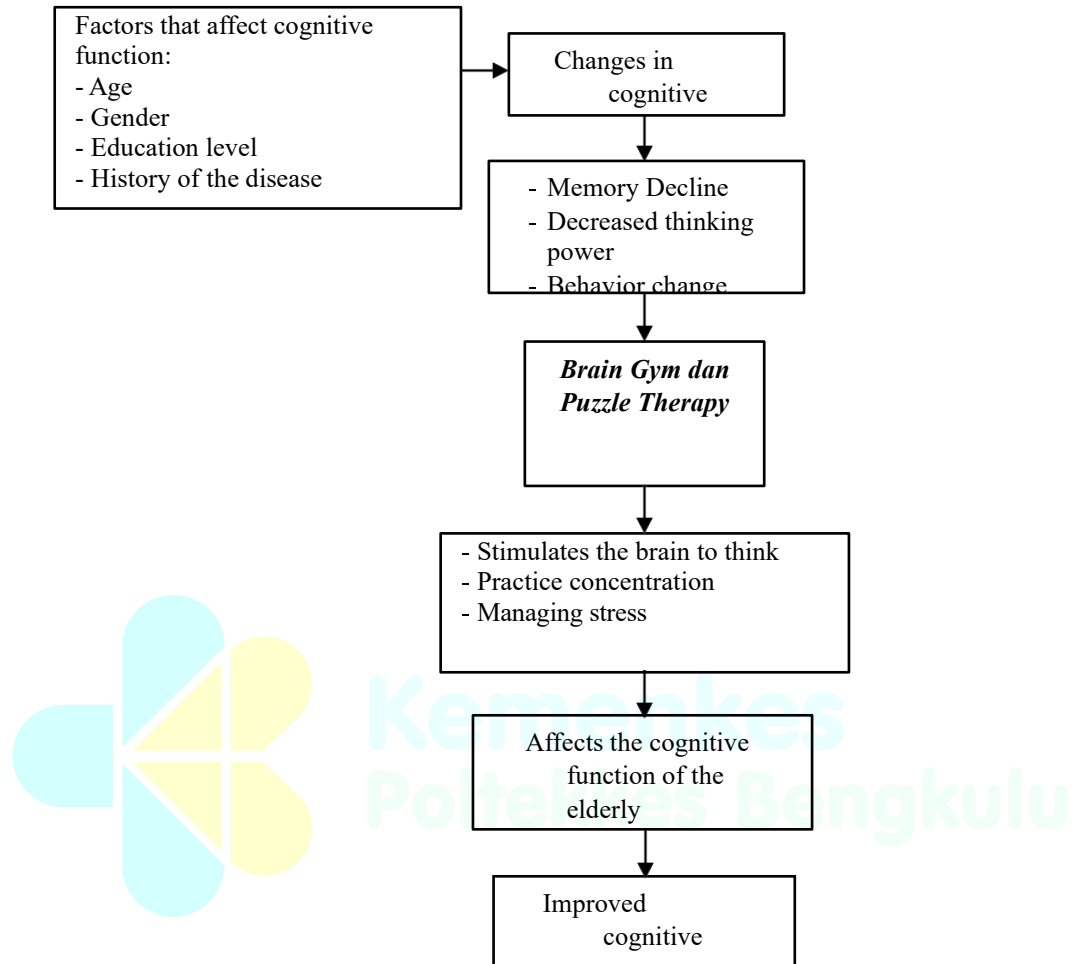


Chart 2. 1 Theoretical Framework

Source : (Margiyati et al., 2021)