CHAPTER II

LITERATURE REVIEW

2.1 Elderly Concept

2.1.1 Definition of Elderly

According to the World Health Organization (WHO), an elderly person is an individual aged 60 or older. This age group is in the later stages of life, characterized by various biological, psychological, and social changes that occur as part of the aging process.

Elderly is the final stage of the aging process, which occurs naturally with increasing age. This stage is characterized by a decline in the function of various organs, such as the brain, heart, liver, and kidneys, as well as a reduction in active tissue mass, especially muscle tissue (Meliyana et al., 2019). Furthermore, elderly individuals are individuals aged 60 and over who experience progressive, cumulative changes, including a decline in the body's ability to maintain resistance to various health disorders.(Wulandari et al., 2023).

2.1.1 Classification of the Elderly

World Health Organization (WHO) groups the elderly based on their age as follows:

1. Middle Age : 45 to 59 years
2. Elderly : 60 to 74 years
3. Old Age : 75 to 90 years
4. Very Old : >90 years

According to the Ministry of Health of the Republic of Indonesia (Depkes RI, 2013), elderly people are classified into several categories based on their age and level of independence, namely:

1. Pre-elderly (pre-elderly), namely individuals who are in the age range of 45–59 years.
2. Elderly (elderly), namely individuals who have entered the age of 60 years or more.
3. High-risk elderly people, namely elderly people aged 60 years and over, are vulnerable to various health problems due to the aging process.
4. Potential elderly, namely individuals aged 60 years or older who still have the ability to work or carry out productive activities that produce goods or services.
5. Non-potential elderly, namely elderly individuals who are no longer able to meet their life needs independently and therefore require assistance from other people.

2.1.2 Aging Process Theory

Aging is a condition in which body tissues experience a decline in their ability to adapt and regenerate physiologically. This change is a natural process that occurs continuously along with the stages of human development and growth (Ratnawati, 2017).

1. Biological Theory
    a. Genetic Theory
        1) Genetic clock theory

The Genetic Clock Theory states that genes play a role in regulating and controlling the aging process. Each species has unique nuclear characteristics and a specific lifespan, known as the genetic clock, which determines the frequency of cell mitosis. This theory is based on the fact that life expectancy varies across species (Ratnawati, 2017).

2) Somatic mutation theory

The somatic mutation theory relies on the fact that body cells (somatic cells) can undergo mutations when exposed to unhealthy conditions. This mechanism involves disruptions in the process of copying genetic information from DNA to RNA and translating RNA into proteins or enzymes, resulting in a gradual decline in organ function.

b. Nongenetic Theory

1) Autoimmune Theory

This theory explains that with age, the immune system's ability to distinguish between the body's own cells and foreign substances declines. This can occur as a result of mutations or post-translational changes in proteins. Changes in cell surface antigens cause the immune system to recognize normal, altered cells as foreign, triggering an immune response that can damage the body's own tissues.

2) Free Radical Theory

The free radical theory states that free radicals are formed as a byproduct of cellular metabolism, particularly during aerobic respiration, which produces energy in the form of adenosine triphosphate (ATP). Free radical instability can inhibit cell regeneration and is considered a major factor in cellular dysfunction.

3) Cross link theory

According to the cross-linking theory, the aging process occurs due to increased cross-linking in the body's molecules, particularly collagen. This increased cross-linking density can disrupt the transport of nutrients and the removal of cellular waste products. As a result, the function of body tissues and organs gradually declines.

2. Sociological Theory

a. Social Interaction Theory

Social interaction theory explains that there is a reciprocal relationship between individuals or groups and their social environment. The well-being and ability of older adults to navigate daily life are influenced by the quality of interactions and support they receive from their surroundings. In older individuals, decline in abilities often affects how they interact with their surroundings. Similarly, individuals experiencing illness tend to experience similar declines in abilities, which can impact the quality of their social interactions.

b. Activity Theory

According to activity theory, successful aging is characterized by the continued involvement of older adults in a variety of meaningful activities, including social, physical, and other productive pursuits. Active participation in social life is believed to increase life satisfaction and well-being in older adults.

c. Continuity Theory of Personality

This theory states that behavior patterns, habits, and how individuals adapt to old age are a continuation of personality characteristics formed in previous stages of life. Therefore, each older adult's response to the aging process can vary depending on their individual personality. It emphasizes that a person will continue to maintain the habits, choices, commitments, values, beliefs, and various other factors that shape their personality.

d. Disengagement Theory

The liberation or withdrawal theory explains that as individuals age, they gradually reduce their roles and involvement in social activities. This process is characterized by reduced interaction with their surroundings and an increased tendency to withdraw from social life.

2.1.3 Changes that Occur in the Elderly

According to Potter and Perry (2009), the aging process causes various changes in elderly individuals, which include physical, psychological, social and spiritual changes, including:

1. Physical Changes

In terms of physical aspects, Nasrullah (2015) explains that aging causes a gradual decline in body function which occurs in various organ systems, including the following aspects, such as::

a. Cell

Body cells, including brain cells (neurons), experience a decline in number because the ability to regenerate cells decreases with age. Surviving body cells tend to enlarge to compensate for the decline in cell number, a phenomenon often seen in muscle cells and certain organs. In the brain, cell numbers also decline, leading to neuron loss, which results in decreased cognitive function and motor coordination. In older adults, cellular repair processes, such as autophagy (clearing of damaged cells), become less efficient, leading to the accumulation of cellular damage.

b. Nervous system

Brain weight gradually decreases due to neuron loss and brain tissue shrinkage (atrophy), affecting cognitive function, information processing, and the ability to adapt to change. The autonomic nervous system, which regulates stress responses (the sympathetic and parasympathetic systems), also declines and becomes less efficient. This decrease in nerve signal transmission slows the body's response to stimuli. This often means older adults take longer to react to urgent or stressful situations, and they recover more slowly from stress.

c. Auditory system

As people age, they experience hearing loss, particularly for high-pitched tones, a characteristic feature of presbycusis. This is caused by the degeneration of hair cells in the cochlea (inner ear), which are responsible for capturing sound. This impairment often makes speech sound muffled and makes it difficult for older adults to understand speech, especially in noisy environments.

d. Vision system

As we age, the pupillary sphincter, the muscle that regulates pupil size, loses elasticity due to sclerosis (hardening of the tissue). As a result, the pupil becomes less responsive to bright or dim light, making it difficult to adapt to changing lighting conditions.

e. Cardiovascular system

Changes in the cardiovascular system that occur with aging are:

a) Heart valves (especially the aorta and mitral) become thickened due to the buildup of calcium and fibrous tissue.

b) Aorta: As we age, the aorta, the body's main artery, experiences a decrease in elasticity due to a reduction in elastin fibers and increased collagen deposition in the vessel walls. A stiff aorta increases afterload (the stress the heart faces when pumping blood), making it work harder.

c) Peripheral resistance increases due to loss of arterial elasticity, which leads to an increase in systolic blood pressure, the pressure that occurs when the heart contracts

to pump blood throughout the body. Therefore, older adults are more susceptible to isolated systolic hypertension, which is common in older adults.

f. Respiratory system

The aging process also affects the respiratory system, characterized by a decrease in the mass and strength of the respiratory muscles, including the diaphragm and intercostal muscles. As a result, breathing becomes more difficult, especially during physical activity or respiratory stress (such as infection).

g. Digestive system

The aging process can cause various changes in the digestive system, one of which is periodontal disease (infection of the gums and bone supporting the teeth), often caused by lack of dental care, poor nutrition, or conditions such as diabetes. Tooth loss can reduce chewing ability, which affects nutrient intake and overall health. Sensitivity to hunger also decreases due to changes in digestive hormones, decreased gastric motility, and the stomach's response to stretching. As a result of these changes, food intake in older adults tends to decrease, which can then impact weight loss.

h. Reproductive system

In women, menopause causes a significant decrease in estrogen levels. This condition results in changes in the reproductive

organs, such as thinning of the vaginal walls, reduced tissue elasticity, and shortening of the vaginal canal. Furthermore, the ovaries atrophy due to the cessation of reproductive function, followed by a decrease in estrogen and progesterone production. Meanwhile, in men, reproductive function is generally maintained because the testicles are still able to produce sperm, although this capacity gradually decreases with age. Sexual desire and activity can also persist into old age, even beyond 70, provided the individual's health is still good.

i. Endocrine system

The endocrine system undergoes various changes with age. One of these is changes in hormone production, which plays a vital role in growth, development, maintenance, and metabolism. These hormones are produced by various endocrine glands and function to regulate various physiological activities:

a) Sex hormones, such as estrogen, progesterone, and testosterone, play a vital role in regulating reproductive function and sexual activity. With aging, production of these hormones tends to decline, which can impact reproductive function and sexual response in older adults.
b) Additionally, melatonin production is also reduced in older adults; this hormone is important for improving sleep, regulating the body's biological clock, and mitigating the effects of changes in sleep patterns.

c) The pancreas gland, with aging, declines in function. This gland plays a crucial role in producing insulin and maintaining balanced blood glucose levels. Reduced pancreatic function can affect the body's ability to optimally regulate glucose metabolism.

d) Adrenal glands: Aging also causes a decline in the activity of the adrenal glands, located above the kidneys. These glands produce various hormones, including adrenaline, which plays a role in regulating the body's response to stress and supporting other physiological functions. Furthermore, the adrenal glands contribute to the production of hormones related to reproductive function in both men and women. One important role is regulating blood vessel contraction (vasoconstriction), ensuring proper blood distribution and flow to various organs.

e) The pancreas, in which activity declines with age, also experiences an increase in hormones, but in smaller amounts. This includes a decrease in the production of ACTH, TSH, FSH, and LH, which play a role in regulating the sleep cycle.(Sari & Halawa, nd).

j. Integumentary system

During the aging process, the dermis loses collagen and elastin, while the subcutaneous layer loses fat tissue, causing the skin to appear wrinkled and sagging. The keratinization process also

disappears, which is normal, and decreased skin cell regeneration leads to the accumulation of dead skin cells on the surface. This results in dry, less radiant skin.

k. Musculoskeletal system

As we age, bone mass (bone mineral density) decreases, reducing bone strength and making them more susceptible to fracture. Osteoporosis is a common condition, in which bones become brittle due to reduced mineral density. Cartilage also experiences a decline in function. Cartilage in joints acts as a cushion. With age, this cartilage wears out or breaks down, leading to conditions such as osteoarthritis. This damage to the cartilage causes stiffness and pain in the joints.

2. Psychosocial Changes

The aging process not only affects physical health but also brings about changes in an individual's psychosocial well-being. These changes are generally related to various life transitions and experiences of loss that occur with age. As a person ages, they face more changes, such as retirement, changing economic circumstances, changing roles within the family and community, declining health and functional abilities, and diminishing social networks.

According to Ratnawati (2017), psychosocial changes in the elderly are closely related to decreased work productivity. As they enter retirement, older adults often face various forms of loss that can impact their psychological and social well-being.

These losses include reduced sources of income, loss of previously held social status or position, reduced interaction with friends and relations, and the cessation of activities or work that have been part of daily life.

These various forms of loss can have a number of impacts on older adults. They begin to recognize the limitations of life and the possibility of death, and must adapt to lifestyle changes, such as moving to a care facility or reduced mobility. Furthermore, job loss can lead to a decline in economic well-being, while living expenses and healthcare costs tend to increase.

Declining health due to chronic illness and physical limitations also poses challenges for older adults. Reduced social engagement can lead to feelings of loneliness and social isolation. Furthermore, sensory impairments, such as decreased vision and hearing, can hinder older adults' ability to perform daily activities.

Elderly people are also vulnerable to nutritional challenges due to economic constraints and changes in physical condition. The loss of loved ones, whether family or peers, can exacerbate feelings of loss and grief. Furthermore, decreased physical strength and changes in physical appearance often affect older adults' perceptions of themselves, which can impact their self-concept and self-esteem.

2.2 The Concept of Sleep

2.2.1 Definition Of Sleep

Sleep is a basic physiological need that plays a crucial role in providing the body and mind with rest and recovery. According to Haryati (2020), sleep has functions encompassing biological, psychological, social, and cultural aspects, and plays a role in maintaining an individual's balance and health. Furthermore, the quality and adequacy of sleep contribute significantly to mental health. Various studies have shown a strong link between good sleep patterns and psychological well-being, where optimal sleep can support mental function and quality of life.

In the elderly, sleep requirements generally range from 6–7 hours per day (Hidayat, 2008). However, many older adults experience changes in sleep patterns, characterized by frequent nighttime awakenings and difficulty returning to sleep. Consequently, the duration and quality of sleep they receive often fall short of recommended needs.(Hasanuddin et al., 2023).

2.2.2 Types of Sleep

a. NREM sleep

NREM sleep is a phase of sleep that occurs due to decreased activity of the reticular activating system in the brain. This phase is often referred to as slow-wave sleep because the brain's electrical activity exhibits waves with a lower frequency than when awake.(Ghaddafi, 2013). NREM sleep is divided into several stages with different characteristics, namely:

1. Phase I

   This stage is the initial phase when a person begins to transition from wakefulness to sleep. During this stage, the individual can still respond to environmental stimuli, although drowsiness begins to increase. Eye movements slow, while the pulse and respiratory rates begin to decrease. This phase lasts briefly, around five minutes, and the individual is still easily awakened.

2. Phase II

   Stage II is marked by the individual entering a light sleep phase. Responses to the environment diminish, eye movements generally cease, and various physiological functions begin to slow. Heart rate, respiration rate, body temperature, and metabolic activity decrease. This stage typically lasts around 10–15 minutes.

3. Phase III

   In this stage, sleep becomes deeper than in the previous stages. Parasympathetic nervous system activity becomes more dominant, slowing the heart rate, breathing rate, and various physiological processes in the body. Individuals in this phase tend to be more difficult to awaken.

4. Stage IV

   Stage IV is the deepest phase of NREM sleep. During this phase, there is a more pronounced decrease in physiological activity, including heart rate, respiratory rate, gastric secretions, and muscle

tone. Body movement is minimal, requiring a strong stimulus to awaken.

b. Rapid Eye Movement (REM)

The REM phase is a period of sleep characterized by increased neurological activity and rapid eye movements. Dreams tend to occur more intensely during this phase than in other sleep phases. The presence of the REM phase is essential because it contributes to the process of storing information in memory, learning ability, and regulating emotional responses. The characteristics of REM sleep are:

1. Brain activity increases similar to when awake.
2. Rapid eye movements behind closed eyelids.
3. Extreme skeletal muscle relaxation (atonia), preventing the body from moving during dreaming.
4. The most vivid dreams usually occur during this phase.
5. The onset of the REM phase typically begins about an hour and a half after an individual falls asleep. As the sleep cycle progresses throughout the night, the duration of this phase increases, reaching its longest duration near morning.

2.2.3 Sleep Quality

Sleep quality reflects the extent to which a person's rest needs are met through the sleep process. Individuals who experience good sleep quality generally wake up feeling refreshed and able to carry out daily activities optimally without experiencing physical or psychological disturbances. Conversely, poor sleep quality can be characterized by various symptoms,

such as fatigue, daytime drowsiness, difficulty concentrating, frequent yawning, headaches, red or uncomfortable eyes, and a reduced ability to maintain attention (Hidayat, 2006).

According to Buysse et al. (1998), sleep quality can be assessed through two main dimensions: quantitative and qualitative. Quantitative aspects relate to measurable sleep characteristics, such as total sleep time, the length of time it takes to fall asleep, and the frequency of awakenings during sleep. Meanwhile, qualitative aspects relate to an individual's perception of their sleep experience, including the depth of sleep and the feeling of satisfaction upon waking.

Sleep quality in the elderly tends to decline with age. This is due to various physiological and psychological changes that occur during the aging process. Elderly individuals generally experience decreased sleep duration, increased frequency of awakenings, and difficulty returning to sleep after waking. Furthermore, the quality of sleep experienced by the elderly tends to be shallower, making them more easily awakened by minor environmental stimuli (Crowley, 2021). Decreased melatonin levels and circadian rhythm disturbances are also major factors in disrupted sleep patterns in the elderly (Mander et al., 2022).

Decreased sleep quality in the elderly is caused by various interrelated factors, including physiological, psychological, and environmental factors. As older adults age, they experience biological changes that affect their natural sleep patterns. Here are some of the main causes of decreased sleep quality in the elderly:

1. Physiological Changes

   The aging process causes a decrease in the production of the hormone melatonin, which regulates sleep-wake cycles. Furthermore, circadian rhythms also shift, making older adults more likely to fall asleep at night and wake up earlier. Their sleep patterns also become shallower and more easily disturbed by noise or light (Mander et al., 2022).

2. Chronic Disease

   Various health problems frequently experienced by the elderly can affect their sleep patterns and quality. Chronic diseases, such as hypertension, diabetes mellitus, osteoarthritis, and cardiovascular disease, often cause physical complaints that disrupt sleep. As a result, the elderly are more susceptible to sleep disturbances, including repeated nighttime awakenings. Furthermore, respiratory disorders, such as sleep apnea and chronic obstructive pulmonary disease (COPD), are also common in the elderly and are known to contribute to reduced sleep quality (Zhou et al., 2021).

3. Psychological Disorders

   Anxiety, depression, and feelings of loneliness, common among older adults, can impact their sleep quality. These psychological disorders make it difficult for older adults to fall asleep or maintain restful sleep (Lee & Cho, 2023).

4. Use of Drugs and

   Long-term medication use is common in older adults due to the high prevalence of chronic diseases in this age group. Various medications,

such as diuretics, beta-blockers, antidepressants, and analgesics, can have side effects that affect sleep patterns. These effects include increased frequency of nighttime urination, restlessness, or other conditions that can disrupt sleep and reduce the quality of rest.

5. Decreased Physical Activity

   Low physical activity or a lack of regular exercise can also contribute to sleep disturbances. Adequate physical activity in the morning has been shown to help improve sleep quality at night.

6. Lifestyle and Sleep Habits

   Consuming caffeine, smoking, or drinking alcohol before bed can disrupt the sleep cycle. Long naps or irregular bedtimes also affect sleep quality (Park et al., 2022).

7. Environment

   Environmental factors such as uncomfortable room temperature, excessive lighting, or noise around the bed can cause elderly people to have difficulty sleeping or wake up frequently (Chen et al., 2021).

2.3 The Pittsburgh Sleep Quality Index (PSQI)

The Pittsburgh Sleep Quality Index (PSQI) is a widely used instrument to evaluate sleep quality and identify sleep disorders. According to Sanningtyas (2013), this instrument is presented in questionnaire form and has been widely used in both research and clinical practice due to its adequate validity and reliability in assessing sleep quality, including in the elderly.

The PSQI was developed by Buysse and colleagues in 1989 as a subjective measure to assess sleep patterns and quality over the past month. It

is assessed using seven main dimensions: individual perception of sleep quality, time to fall asleep, duration of sleep, sleep efficiency, sleep disturbances, use of sleep-inducing medications, and daytime functional impairment. Each dimension is scored from 0 to 3, and all scores are then summed to produce a total PSQI score ranging from 0 to 21. A higher total score indicates poorer sleep quality, while a lower score indicates better sleep quality (Buysse et al., 1989).

1. Subjective Sleep Quality

   Subjective sleep quality reflects a person's personal assessment of their overall sleep experience. This component indicates the extent to which an individual is satisfied with their sleep, ranging from very good to very poor. This assessment is influenced not only by the length of sleep but also by feelings of refreshment, comfort, and recovery upon awakening. In older adults, low perceived sleep quality is often characterized by restless sleep, frequent nighttime awakenings, and a feeling of fatigue upon waking (Buysse et al., 1989).

2. Sleep Latency

   Sleep latency refers to the length of time it takes a person to enter a sleep state after lying down. This aspect is used to assess an individual's ability to initiate sleep. The longer the time required, the greater the likelihood of sleep disturbances. In older adults, delays in falling asleep can be influenced by various factors, such as biological changes due to aging, anxiety, stress, low physical activity, and habits that are less conducive to

healthy sleep, such as using electronic devices before bedtime (Buysse et al., 1989).

3. Sleep Duration

   Sleep duration indicates the total amount of time actually spent sleeping during a single night. This component provides an indication of the adequacy of a person's rest. Inadequate sleep can lead to decreased physical and mental function, including reduced concentration, increased fatigue, memory impairment, and a reduced quality of life. In older adults, sleep requirements generally range from 6–8 hours per day, so a shorter sleep duration may indicate poor sleep quality (Potter et al., 2021).

4. Sleep Efficiency

   Sleep efficiency describes the effectiveness of time spent in bed for actual sleep. It is assessed by comparing the amount of time spent asleep to the total time spent in bed. A low efficiency score indicates that most of the time in bed is not spent sleeping, for example due to difficulty falling asleep or frequent waking during the night. Conversely, a high efficiency score reflects better sleep quality (Buysse et al., 1989).

5. Sleep Disorders

   This component evaluates various conditions that can interfere with sleep. Common contributing factors include repeated nighttime awakenings, the need to urinate, respiratory problems, coughing, snoring, changes in body temperature, nightmares, pain, and other factors that disrupt sleep. In older adults, sleep disturbances can be triggered by physiological changes due to aging, chronic illness, the use of certain medications, and unfavorable

environmental conditions. The increased frequency of these disturbances is generally associated with decreased sleep quality (Miller, 2019).

6. Use of Sleeping Pills

   This aspect assesses how frequently a person uses medication to aid sleep. High frequency of use may indicate a sleep problem that requires specialized treatment. While sleeping pills can help speed up sleep onset, long-term use can potentially lead to side effects and dependence. Therefore, various non-pharmacological approaches, such as practicing sleep hygiene, relaxation techniques, regular physical activity, and elderly exercise, are recommended to improve sleep quality in the elderly (Stanley & Beare, 2018).

7. Daytime Dysfunction

   Daytime activity dysfunction describes the impact of sleep quality on a person's ability to perform daily activities. Poor sleep quality can lead to daytime sleepiness, decreased energy, reduced concentration, low motivation, and a decreased ability to complete routine activities. In older adults, this condition can increase dependence on others, reduce productivity, and negatively impact quality of life. Therefore, this component is an important indicator in assessing the impact of sleep disorders on an individual's daily functioning (Buysse et al., 1989).

2.4 Nursing Care Concept

Providing nursing care to elderly people with sleep disorders is carried out systematically through the stages of the nursing process. These stages include data collection or assessment, establishing a nursing diagnosis,

determining expected outcomes, developing an action plan, implementing interventions, and evaluating the results achieved. In implementing this care, nurses refer to the Indonesian Nursing Diagnosis Standards (IDHS), the Indonesian Nursing Outcome Standards (SLHS), and the Indonesian Nursing Intervention Standards (SIHS) to ensure that the care provided is focused, comprehensive, and in accordance with applicable nursing practice standards.

2.4.1. Assessment

The first step in providing nursing care is conducting an assessment to obtain the necessary information regarding the client's health condition. For elderly individuals experiencing sleep disturbances, a comprehensive assessment is conducted, combining interviews, observations, physical examinations, and the use of appropriate measuring instruments. The information obtained includes the client's complaints, observable signs by the nurse, factors potentially affecting sleep quality, and the impact of sleep disturbances on the elderly's ability to perform daily activities. The results of this assessment serve as the basis for determining nursing problems and developing a plan of action.

1. Client Identity

   An identity assessment is conducted to obtain the client's demographic data, including name, age, gender, education, occupation, marital status, religion, and address. This data is needed to help nurses understand the client's characteristics that may influence their health and sleep patterns.

2. Health Perception and Management

The assessment of perception and health management aims to find out how the elderly view their health conditions and the efforts made to maintain health. The data studied included current health problems, main complaints, current disease history, past disease history, smoking habit history, coffee consumption, alcohol, diet, allergies, drug use, life expectancy in the orphanage, and elderly knowledge about the disease and its prevention efforts. This assessment is important to identify risk factors, lifestyle habits, levels of adherence to treatment, and the ability of the elderly to carry out health maintenance independently.

3. Activities and Exercises

   The activity assessment was carried out to determine the level of independence of the elderly in carrying out daily activities (Activities of Daily Living). In this format, the Barthel Index is used, which assesses the ability of the elderly to eat, change places, personal hygiene, use of toilets, bathe, walk, go up and down stairs, dress, and control of urine and fecal elimination. The higher the Barthel Index score indicates the better the level of independence, while a low score indicates the need for help in carrying out daily activities. Activity assessment is important because limited mobility can affect quality of life, risk of falls, and the ability of the elderly to meet basic needs.

4. Nutrition and Metabolism

   Nutrition assessment aims to assess nutritional status as well as factors that affect the body's metabolic balance. The data studied included diet, type of food, frequency of meals, appetite, weight changes, ability to

chew and swallow, fluid intake, skin condition, oral mucosa, and hydration status. In addition, a Nutrition Determinant Assessment was carried out to identify the risk of malnutrition in the elderly. Good nutritional status plays an important role in maintaining immune function, accelerating tissue healing, and maintaining the physical fitness of the elderly.

5. Elimination

   The aim of elimination studies is to find out the functioning of the gastrointestinal and digestive systems. The data studied included the frequency, consistency, and pattern of defecation, the presence of constipation or diarrhea, frequency of urination, nocturia, urinary incontinence, the use of elimination aids, and complaints of pain when urinating. Changes in elimination function often occur in the elderly due to the aging process, so it needs to be studied to prevent complications that can interfere with quality of life.

6. Rest and Sleep Assessment

   Sleep pattern assessment was carried out to determine the quality and quantity of sleep of the elderly. The data studied included length of sleep, sleep time, sleep habits, difficulty starting sleep, frequency of waking up at night, sleep quality after waking up, use of sleeping medications, as well as factors that interfere with sleep such as pain, nocturia, environment, or psychological disorders. This assessment is important because sleep disorders in the elderly can affect physical, cognitive, emotional, and overall quality of life.

7. Cognitive and Perception

   Cognitive assessment aims to assess neurological function and intellectual ability of the elderly. The aspects studied included the level of awareness, orientation, communication skills, vision function, hearing, pain perception, mental status, depression, and cognitive function using instruments such as Short Portable Mental Status Questionnaire (SPMSQ), Mini Mental State Examination (MMSE), and Geriatric Depression Scale (GDS). This assessment aims to detect memory disorders, dementia, depression, or sensory disorders that can affect the ability of the elderly to carry out daily activities

8. Self-Perception and Self-Concept

   The study of self-concept aims to find out how the elderly view themselves, including body image, self-esteem, self-identity, self-ideal, and feelings about their health condition. This study is important because physical and psychosocial changes due to the aging process can affect self-acceptance and psychological well-being of the elderly.

9. Coping and Stress Tolerance

   The koping assessment is carried out to determine the ability of the elderly to deal with problems, changes in health conditions, and stress experienced. The aspects studied include sources of stress, coping mechanisms used, family or environmental support, and the ability of the elderly to solve problems. This assessment helps the nurse determine the need for psychological support and appropriate interventions.

10. Sexuality and Reproduction

    The study of sexuality aims to find out the changes in sexual function related to the aging process and the diseases suffered. The data studied included reproductive history, hormonal changes, sexual problems, and complaints related to the reproductive system. Despite the decline in reproductive function, sexual needs still need to be studied as part of the quality of life

11. Roles and Relationships

    This study aims to find out the social role of the elderly in the family and society. The aspects studied include relationships with partners, children, family, friends, and the surrounding environment, including social support and the ability to carry out social roles. Good social support affects the physical and psychological health of the elderly.

12. Values and Beliefs

    The study of values and beliefs aims to find out the beliefs, religions, worship practices, and values that the elderly adhere to in living life and facing illness. Fulfilling spiritual needs is an important part of holistic nursing care for the elderly.

13. Physical, Diagnostic, and Medical Examinations

    Physical examinations are carried out systematically starting from examination of vital signs, general status, respiratory, cardiovascular, integument, abdomen, neurological, musculoskeletal, to supporting examinations such as laboratory examinations, radiology, electrocardiography (ECG), ultrasound (ultrasound), and other

diagnostic examinations as indicated. In addition, the medical therapy that is being undergone is also studied, including the type of drug, dosage, and method of administration. Physical and supporting examinations aim to obtain objective data that support the enforcement of nursing diagnoses and determine the need for appropriate interventions. Health Perception and Management

The assessment of perception and health management aims to find out how the elderly view their health conditions and the efforts made to maintain health.

2.4.2. Nursing Diagnosis

Nursing diagnoses are established based on the results of an assessment that has been analyzed to identify the client's response to their health condition. Nursing diagnoses serve as the basis for determining appropriate interventions to achieve established nursing goals and outcomes. For older adults experiencing sleep problems, the nursing diagnosis that can be established refers to the Indonesian Nursing Diagnosis Standards (IDHS), namely Sleep Pattern Disorders (D.0055). This diagnosis describes changes in sleep patterns and quality that can affect the individual's physical and psychological condition, as well as their ability to carry out daily activities.

1. Definition

   According to the Indonesian Nursing Diagnosis Standard (SDKI), sleep pattern disorders are defined as disturbances in the quality and quantity of sleep time due to external factors. (PPNI, 2017).

2. Pathway

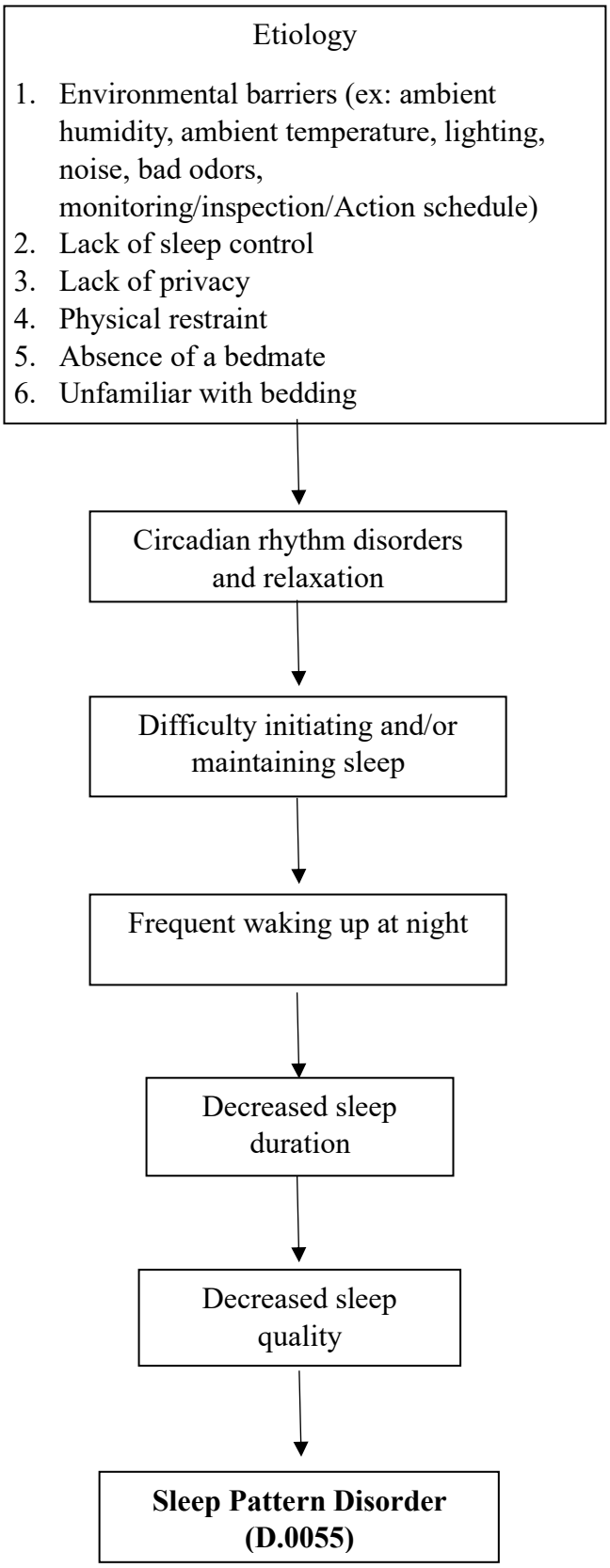

Figure 2.1 Pathway of Sleep Pattern Disturbance in the Elderly

3. Major and Minor Data

   a. Major Data

   1) Subjective

      - Complaining of difficulty sleeping
      - Complaining of waking up frequently
      - Complaining about not being satisfied with sleep
      - Complaining of changed sleep patterns
      - Complaining about not getting enough rest

   2) Objective

      - Not available

   b. Minor Data

   1) Subjective

      - Complaining about decreased ability to carry out activities

   2) Objective

      - Not available

4. Causative factor

   According to SDKI (PPNI, 2017), the causes of sleep pattern disorders include:

   a. Environmental barriers (noise, lighting, room temperature, unpleasant odors).
   b. Lack of control over sleep.
   c. Lack of privacy.
   d. Physical discomfort.
   e. Not familiar with the environment or bed.

f. Chronic diseases such as hypertension, diabetes mellitus, osteoarthritis, heart disease, and respiratory disorders.
g. Psychological factors such as stress, anxiety, and depression.
h. Side effects of certain therapies or medications.

2.4.3. Nursing Outcomes

Nursing outcomes are the client's conditions, behaviors, or perceptions that are expected to change after nursing interventions are provided. Nursing outcomes for older adults with sleep disorders refer to the Indonesian Nursing Outcome Standards (SLKI), specifically Sleep Patterns (L.05045).

1. Objective: After nursing intervention for 3 x 24 hours, it is hoped that the client's sleep patterns and sleep quality will improve.
2. Result criteria:
   a. Complaints of difficulty sleeping decreased.
   b. Complaints often decreased.
   c. Complaints of sleep dissatisfaction decreased.
   d. Complaints of changing sleep patterns decreased.
   e. Complaints of insufficient rest decreased.
   f. Improved sleep quality

2.4.4. Nursing Interventions

Nursing interventions for the elderly with sleep pattern disorders refer to the Indonesian Nursing Intervention Standards (SIKI), namely Sleep Support (I.05174) and Activity and Rest Education (I.12362).

1. Sleep Support (I.05174)

a. Observation

1) Identify activity and sleep patterns
2) Identify factors that interfere with sleep (physical and/or psychological)
3) Identify foods and drinks that disrupt sleep (e.g., coffee, tea, alcohol, eating close to bedtime, drinking lots of water before bed)
4) Identify the sleeping pills consumed

b. Therapeutic

1) Environmental modifications (e.g., lighting, noise, temperature, mattress, and bed)
2) Limit nap time, if necessary.
3) Facilitate stress relief before bed
4) Set a regular sleep schedule
5) Perform procedures to increase comfort (e.g. massage, positioning, acupressure therapy)
6) Adjust medication schedule and/or actions to support the sleep-wake cycle.

c. Education

1) Explain the importance of getting enough sleep during illness.
2) Encourage adherence to bedtime habits
3) Recommend avoiding foods/drinks that disturb sleep
4) Recommend the use of sleeping pills that do not contain suppressors of REM sleep.

5) Teach factors that contribute to sleep pattern disturbances (e.g., psychological, lifestyle, frequent work shift changes)
6) Teach non-pharmacological methods of fitness exercises for the elderly.

2. Activity and Rest Education (I.12362)
   a. Observation
      1) Identify readiness and ability to receive information
   b. Therapeutic
      1) Provide materials and media for organizing activities and rest.
      2) Schedule the provision of Health Education as agreed
      3) Give the patient and family the opportunity to ask questions.
   c. Education
      1) Explain the importance of doing physical activity/exercise regularly
      2) Encourage involvement in group activities, play activities or other activities
      3) Suggest setting up a schedule of activities and rest
      4) Teach how to identify the need for rest (e.g., fatigue, shortness of breath during activity)
      5) Teach how to identify targets and types of activities according to ability.

2.4.5. Nursing Implementation

Implementation in the elderly with sleep pattern disorders is carried out based on the Sleep Support intervention (I.05174) and Activity and Rest

Education (I.12362) with the application of elderly fitness exercises as an innovative intervention.

Nursing actions that can be taken include identifying the client's activity and sleep patterns, identifying factors that disrupt sleep, and assessing the client's readiness and ability to receive information related to activity and rest. Nurses also establish a regular sleep schedule, provide education on the importance of maintaining good sleep habits, and encourage clients to avoid habits that can disrupt sleep.

In addition, nurses provide health education on the importance of regular physical activity to improve sleep quality, help clients develop a balanced schedule of activity and rest, and teach them how to recognize the need for rest and activity based on their abilities. Clients are also encouraged to participate in group activities and physical activities appropriate to the elderly's condition.

As part of an innovative nursing intervention, elderly fitness exercises are scheduled three times per week for a two-week period. Each session lasts approximately 30–45 minutes and includes a series of warm-up, core exercises, and cool-down activities, with an intensity tailored to each senior's individual physical condition. These activities are designed to encourage increased physical activity while providing a relaxing effect on the body. Through regular exercise, it is hoped that sleep patterns and sleep quality will improve in the elderly.

2.4.6. Nursing Evaluation

Evaluation is a continuous assessment phase to determine the effectiveness of nursing interventions on a client's condition. Assessment is conducted by comparing subjective and objective data before and after the intervention, along with measuring sleep quality using the Pittsburgh Sleep Quality Index (PSQI).

In older adults with sleep disorders, evaluation focused on changes in sleep patterns and quality following interventions such as Sleep Support, Activity and Rest Education, and the implementation of elderly fitness exercises. The success of the interventions was demonstrated by a decrease in complaints of difficulty sleeping, a decrease in the frequency of nighttime awakenings, increased satisfaction with sleep, improved regularity of sleep patterns, a decrease in complaints of insufficient rest, and improved sleep quality based on a decrease in PSQI scores.

Monitoring of nursing care outcomes is carried out through evaluation documentation using the SOAP approach (Subjective, Objective, Assessment, Plan). Routine recording at each meeting helps nurses assess the client's response to the interventions provided and determine the need for subsequent nursing actions.

2.5 The Concept of Elderly Fitness Gymnastics

2.5.1 Understanding Elderly Fitness Gymnastics

Gymnastics is a series of systematic, organized, and well-designed movements that can be performed individually or in groups to optimally improve body function (Suroto, 2004). Gymnastics for the elderly is a series of movements specifically designed to improve their body's functional abilities, thereby helping to maintain health and well-being in old age.

Elderly exercise, also called exercise for the elderly or senior exercise, is a physical exercise program specifically for older adults with the goal of improving their physical health and quality of life, including improving their sleep patterns. This intervention includes non-pharmacological strategies frequently utilized in geriatric healthcare. Its implementation not only aims to improve general well-being but also helps address sleep disorders, thus improving the quality of seniors' rest.(Puzzy Handayani & Puspita Sari, 2020).

According to (Suhardo, 2004) in (Adiputra et al., 2021), elderly fitness gymnastics is a type of exercise suitable for the elderly because its movements are designed to avoid jumping (low impact), leaps, crossing steps, forward and backward movements, and jerking movements. This activity still has a positive effect on cardiovascular and respiratory function even when performed at light to moderate intensity levels. Its implementation involves various major muscle groups of the body simultaneously, mirroring movements frequently performed in daily life, and ensuring proportional distribution of body weight on both sides of the body. The series of movements in this gymnastics was developed to support comprehensive physical fitness. Expected benefits include improved heart and lung function, strengthening and increasing muscle endurance, improving body flexibility, and maintaining optimal body composition.

2.5.2 Benefits of Fitness Gymnastics for the Elderly

According to(Jehaman et al., 2022)There are many benefits of fitness exercises for the elderly, namely:

1. Improving the physical fitness of the elderly.
2. Reduces the risk for most common causes of death, such as diabetes, heart problems, stroke, and some cancers.
3. Helps support healthy aging, meaning that even as they age, the elderly remain fit and healthy.
4. Increase immunity and endurance of the cardiovascular system and musculoskeletal system.
5. It has an impact on mental health so that parents feel calmer, more comfortable, and more comfortable when sleeping.
6. Helps facilitate the transport of nutrients to body tissues, which allows the secretion of melatonin and beta endorphin to be maximized and helps increase physical activity in the elderly.

2.5.3 The Effect of Fitness Gymnastic for the Elderly on Sleep Quality

Fitness gymnastics for the elderly is a form of physical activity that can improve sleep quality through several physiological mechanisms. When doing gymnastics, the muscles work more actively so that the body uses more energy. The increase in energy use causes the body to have a greater need to rest (homeostatic sleep drive), so that the elderly become more sleepy, fall asleep faster, and sleep better (Kredlow et al., 2015).

In addition, regular physical activity also helps to reset the body's circadian rhythm. Gymnastics acts as a zeitgeber or time signaler that helps the Suprachiasmatic Nucleus (SCN) in the hypothalamus, as the center of circadian rhythm regulation, recognize the body's active time and rest time. When circadian rhythms become more regular, the SCN sends signals to the

pineal gland to increase melatonin secretion at night. Melatonin is a hormone that plays a role in initiating and maintaining sleep so that increased its secretion helps the elderly fall asleep more easily and reduces the frequency of waking up at night (Reiter et al., 2014).

In addition, fitness exercises also provide a relaxation effect by helping to reduce stress levels and body tension. This relaxation condition decreases the activity of the Hypothalamic–Pituitary–Adrenal (HPA) axis, so that cortisol hormone levels at night also decrease. Normally, cortisol levels should be low at night so that the body can enter the rest phase. A decrease in cortisol levels makes the body not in a hyperarousal state, so that the process of starting sleep becomes easier and sleep quality improves. Therefore, fitness exercises for the elderly can help speed up the time to fall asleep, reduce the frequency of waking up at night, increase sleep duration, and improve overall sleep quality (Irwin, 2020).

The research entitled "The Effect of Elderly Gymnastics on Sleep Quality in Elderly People with Insomnia" was conducted by Erika Dewi Noorratri and Tri Susilowati in 2022. This study used a pretest-posttest design without a control group and was conducted at the Posyandu Elderly Sehat Fitness RW 08, Sukoharjo Village. The results of the study show that elderly gymnastics can significantly improve sleep quality in the elderly who experience insomnia. This is shown by the improvement in sleep quality scores after regular gymnastics interventions.

Another study entitled "The Influence of Elderly Gymnastics on the Quality of Sleep of the Elderly at the Tresna Werdha Natar Lampung Home" was conducted by a research team from STIKes Panca Bhakti Lampung in 2021. Using a pre-experimental research design and a t-test, this study shows that the sleep quality of the elderly experienced a significant improvement after participating in regular elderly gymnastics activities.

A study entitled "The Effect of Elderly Fitness Gymnastics (Ergonomic) on Sleep Quality" conducted at the Tresna Werdha Budi Mulia 02 Social Home, showed that ergonomic fitness gymnastics for the elderly was effective in improving the quality of sleep of the elderly. This study used a one-group pretest-posttest design and showed an improvement in sleep quality after regular ergonomic exercise for the elderly

2.5.4 Intensity of Elderly Fitness Gymnastics

Elderly exercise activities can be carried out according to the time and frequency of exercise that has been determined, namely:

1. Duration of training

   To improve sleep quality, older adults should engage in thirty-minute combined exercises two to three times a week (Widiastuti et al., 2020). Research conducted by Muhammat Ramadha Syahputra and Aisyah (2021) at the Mufakat Elderly Community Health Post (Posyandu Lansia Mufakat) in Kandang Besi Village, West Kotaagung District, Tanggamus, Lampung, found that exercise for the elderly significantly improved sleep quality. Improved sleep quality can be achieved through three weekly elderly exercises.

Based on research by Revina Indria Tsani (2024) conducted in Soborejo Village, Pringsurat District, an intervention in the form of elderly exercise, given in three sessions over six days, each lasting 15 minutes, was proven to contribute to improving sleep patterns. The results showed a decrease in insomnia levels in the elderly, from initially mild to no insomnia complaints.

2. Exercise frequency

   According to KONI sports doctors, fitness exercises performed two to three times a week can contribute to reducing insomnia levels in the elderly.(Riyanto et al., 2020)