Relationship Between The Fulfilment of Sleeping To Memory Loss in The Elderly People

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Abstract: The aging process in humans results in a reasonable decline in brain function and especially changes in memory ability (memory). The factors that influence it include meeting the need for sleep at night. This study aims to determine the relationship between fulfilling sleep needs and memory impairment in the elderly. This research method uses correlational analytic design with crossectional approach. The sampling technique used purposive sampling which amounted to 33 respondents. The results of the study with Spearman Rank test (α <0.05) showed that there was a relationship between Sleep Needs and Decline in Memory in the Elderly (p = 0,000, r = 0,763). Efforts that need to be done include inviting the elderly to read, write, discuss groups, walk every morning for a maximum of 15 minutes and encourage the elderly to get enough sleep for ± 5-6 hours a day.

Keywords: Aging, Memory, Elderly Process.

1. Introduction

In the course of human life, aging is a natural thing and will be experienced by all people who are blessed with long life. Only the slow or fast process depends on each individual concerned because the aging process cannot be avoided. Individually, aging processes can cause various problems both physically, biologically, mentally and socio-economically (Nugroho, 2008). This can be seen from a number of changes: the skin of the body starts to dry and wrinkles, decreases the power of accommodation, bones begin to porous, hair turns white, emotional sensitivity increases, sexual drive decreases, walking speed decreases as does the brain

Indonesia, the incidence of dementia in 2005 was 606,100 people and in 2015 it was estimated at 24.4 million. The increase is in line with increasing life expectancy (UHH), which is 63 years for men and 67 years for women. Most people think that dementia is a common thing for the elderly and is a physiology of life, in fact many factors trigger a decrease in memory, one of which is lack of sleep. Every year in the world, an estimated 20% -50% of adults report a sleep disorder and around 17% experience serious sleep disorders. The prevalence of sleep disorders in the elderly is quite high at around 67% (Japardi, 2002). In Indonesia, the incidence of insomnia in the elderly aged 60 years and over every year is 30-45% while the prevalence of sleep disorders in the elderly in East Java is around 16.5%, which means there are 342,342 elderly people who experience sleep disruption (Mimbo, 2009).

Sleep is an important physiological phenomenon in maintaining the balance of regulation of the body's system, for thermoregulation, the function of restoration and energy reserves is also a brain process needed by a person to function properly. Sleep physiology is a complex process and involves various kinds of neurotransmitters. With sleep, humans can maintain their freshness, the needs and metabolism of their entire body. Sleep is needed for memory because of a consolidation process, which is a process in which synaptic changes occur that make newly stored memories more durable and stable (Nelson, 2008).

Efforts that must be made in overcoming memory decline in the elderly include: inviting the elderly to use leisure time by carrying out physical activities involving cognitive and physical functions. Activities that involve cognitive functions such as: reading, writing, filling out crosswords

and participating in discussion groups. Whereas physical activities that can be carried out include cycling, fitness training regularly, recreation, walking, doing homework and encouraging the elderly to sleep for ± 5-6 hours a night..

2. Research Methodology

This research method uses correlational analytic design with crossectional approach. The sampling technique used purposive sampling which amounted to 33 respondents. With inclusion criteria: willing to be a respondent, age ≥ 50 years old, able to communicate well, not taking analgesic drugs, antihistamines, diuretics, beta blockers, anti-depressants and sleeping pills. Sleep quality variables using the Pittsburgh Sleep Quality Index (PSQI) and memory variables using Mini Mental State Examination (MMSE).
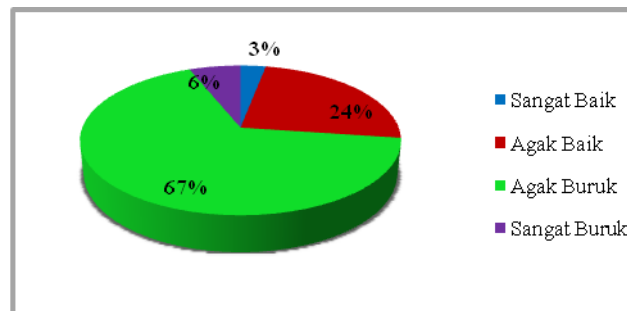
3. Result and Discussion

3.1 Sleep Quality

Figure 1. Distribution of respondents' characteristics based on meeting sleep needs

Based on Figure 1 shows that the fulfillment of sleep needs at most has a rather poor fulfillment of sleep needs as many as 22 respondents (67%) and the least is having a very good fulfillment of sleep needs as much as 1 respondent (3%).

The measurement results using the Pittsburgh Sleep Quality Index (PSQI) questionnaire in question no.8 about problem solving, most of the elderly said that the problem at hand was a collection of several problems that disturbed the concentration of the elderly when asked to mention objects that could be remembered and most the elderly said they were lazy to eat even though they felt hungry and was one of the signs of depression so that the elderly could not sleep.

Increasing age also influences the physiological functions of the nervous system which then affect brain cell activation resulting in a decrease in sensory and motor systems. Decreasing this nervous system causes the elderly to need a stronger intensity of stimulation for the response. Sensory changes such as visual impairment can increase sensitivity to stimulation of bright and dark light. In addition, changes also occur in the circadian rhythm which results in an increase in early sleep, early awakening, and an increase in waking at night (Lueckenotte, 2000).

According to Kozier (2004), a normal sleep pattern in the elderly consists of sleeping for approximately 6 hours, experiencing a period of REM sleep (Rapid Eye Movement) of 20-25%, stage 4 NREM (Non Rapid Eye Movement) decreases and sometimes not however, the first REM (Rapid Eye Movement) sleep becomes longer, often builds up at night, and takes longer to sleep again. In the elderly, there is a change in the NREM (Non Rapid Eye Movement) phase, where stage II sleep has no significant changes. However, entering stage III sleep changes begin to appear later and stage IV sleep decreases and sometimes even none. While the REM sleep phase (Rapid Eye Movement) has no decreased.

Other causes that cause disruption to meeting sleep needs in the elderly are depression. Depression can cause sleep time that is needed long enough, wake up to sleep early in the morning and difficult to sleep again so that sleep during the day will be longer (Lueckenotte, 2000).

Lifestyle influences someone's waking schedule. This lifestyle includes the habit of drinking drinks containing caffeine or alcohol, the daily activities of the elderly. This is because a person's routine during the day will affect his rest at night (Perry and Potter, 2005). Environmental factors also affect a person's health. This becomes even more important for the elderly who, along with their age, are

becoming more sensitive to their environment. According to Perry and Potter (2005), the influential environment is the physical environment, namely light, temperature, and noise. Sounds that often cause sleep disorders are sounds that are irregular. Temperatures that are too hot or cold can also cause sleep disorders, causing older people to wake up more often.

3.2 Memory
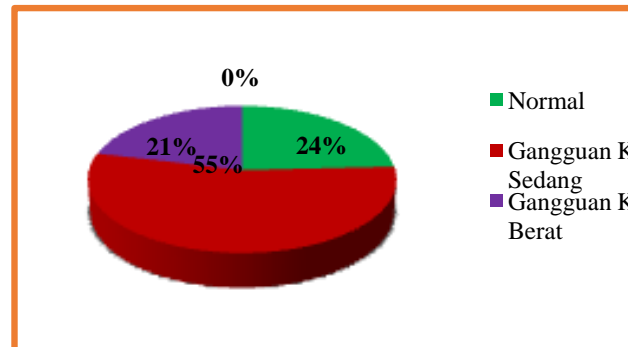
Figure 2. Distribution of respondents' characteristics based on memory

Based on Figure 2 above shows that the most memory of respondents is having moderate cognitive impairment as many as 18 respondents (55%) and the least have severe cognitive impairment as many as 7 respondents (21%).

The measurement results using the Mini Mental State Examination (MMSE) questionnaire on the calculation items, most of the elderly had a score of 2 with a maximum score of 5 due to the education level of the elderly who were mostly non-schooled as many as 15 respondents (45.5%). The level of education is related to the calculation of numbers on the Mini Mental State Examination (MMSE) test. Elderly people who do not attend school have difficulties in reducing the numbers mentioned by the researcher. And on the item, remembering that most of the elderly are still assisted with the introduction of certain codes or signs, for example indicated by the object, given the first letter, have a score of 1 with a maximum score of 3 because 19 elderly (58%), only silence at home which is believed to accelerate the decline of memory function.

Reading, writing, filling out crosswords, being active in group discussion activities or physical activities such as walking, exercise is very important for the elderly because it can strengthen their memory (Nelson, 2008). However, for the elderly who do not carry out any activities, do not want to read, are not active in group activities especially just staying at home contemplating their fate is believed to accelerate the decline of their memory function. The aging phenomenon that occurs in the brain along with the increase in age results in a decrease in brain function naturally because physiologically the body's ability to get oxygen in the bloodstream becomes reduced. In fact, oxygen is a brain food to function properly (Kuntjoro, 2002).

Cognitive function is a person's ability to receive, process, store and reuse all sensory inputs properly. Cognitive function in the elderly changes due to the aging process, among others, the number of brain cells decreases and brain weight owes 5-10% and has a cognitive function deficit. Elderly who experience cognitive function begins with a decrease in memory or memory and the level of education is one of the factors that influence it (Nugroho, 2008).

3.3 Relationship Between The Fulfilment of Sleeping To Memory Loss in The Elderly People

Table 1. Distribution of cross tabulation between Sleep Needs and Decreasing Memory in the Elderly

No	Sleep Quality	Memory						Total	
		Heavy Cognitive Disorders		Disorders Moderate Cognitive		Normal			
		N	%	N	%	N	%	N	%
1	Very bad	1	3	1	3	0	0	2	6
2	Rather bad	6	18,2	16	48,5	0	0	22	66,7
3	Rather well	0	0	1	3	7	21,2	8	24,2
4	Good	0	0	0	0	1	3	1	3
Total		7	21,2	18	54,5	8	24,2	33	100
Sperman's Rho: ρ= 0,000 (α<0,05) rs hitung= 0,763									

Based on Table 1 shows that of the 33 respondents most of them had a rather poor fulfillment of sleep needs as many as 22 respondents (66.7%) with moderate cognitive impairment as many as 16 respondents (48.5%), and had severe cognitive impairment of 6 respondents (18, 2%). Respondents who have a rather good fulfillment of sleep needs as many as 8 respondents (24.2%) with normal cognitive as many as 7 respondents (21.2%) and have moderate cognitive impairment as much as 1 respondent (3%). For respondents who have very poor fulfillment of sleep needs as many as 2 respondents (6.1%) with moderate cognitive impairment as much as 1 respondent (3%) and those who have severe cognitive impairment as much as 1 respondent (3%). And respondents who have excellent sleep needs as much as 1 respondent with normal cognitive (3%).

Then from the results of the analysis using the Spearman Test shows that the value of ρ is significant 0,000 where it is smaller than 0.05 with a correlation coefficient r = 0.763, which means the degree of the strong relationship between meeting sleep needs and memory decline in the elderly.

In accordance with the results of cross distribution shows that most respondents have moderate cognitive impairment with the fulfillment of rather poor sleep needs as many as 16 respondents (48.5%) caused by depression factors in dealing with old age and family problems that arise in the elderly family living and lack of family participation to provide intellectual stimulus to the elderly related to the function of his memory. Depression can affect one's sleep and sleep deprivation can cause cognitive problems (Lueckenotte, 2000). As experienced by the elderly who have difficulty concentrating and absorbing new information when interviewed using the Mini Mental State Examination (MMSE) questionnaire. Age factors also influence it, as many as 10 out of 16 respondents aged> 60 years. With increasing age there is also a decrease in the sleep period and circadian rhythms that results in an increase in sleep early, waking up early, accompanied by an increase in waking at night (Lueckenotte, 2000). While at least respondents have normal cognitive with a very good fulfillment of sleep needs as much as 1 respondent (3%). According to Nelson (2008) people who sleep soundly at night tend to keep information that is newly acquired longer than people who sleep poorly because of a good night's sleep is important for memory consolidation.

Sleep physiology is a complex process and involves various kinds of neurotransmitters. With sleep, humans can maintain their freshness, the needs and metabolism of their entire body. Sleep is very much needed for the consolidation process, which is a process in which synaptic changes occur that make newly stored memories more durable and stable (Hidayat, 2016). Chronic sleep deprivation increases levels of the stress hormone cortisol, which can damage or interfere with brain cells needed for learning and slow down the memory process (Leproult et al., 1997).

4. Conclusion

There is a strong relationship between fulfilling sleep needs and memory impairment in the elderly.

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