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SLEEP DISORDERS AND EFFECTIVITY OF STUDY INTERVENTION OF ELDERLY: REVIEW ARTICLE

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Abstract

Backgrounds: Sleep disturbance is a problem that arises in the elderly that occurs physiologically. **Objectives**: The aim of this study is to identify the types of sleep disorders in the elderly and to examine studies management to treat sleep disorders in the elderly population. **Methods**: This research is a descriptive study with Study Literature. The research process used articles in the PubMed, SCOPUS, Web of Science, Cochrane Library, and OpenGrey databases. Of the total 1,620 articles retrieved in the search, ten were included in the final analysis of the study. The first stage of this research is to identify sleep disorders experienced by the elderly. **Results:** Of the 88 types of sleep disorders (The American Academy of Sleep Medicine), only 6 types were considered to be included in this study, namely insomnia (requiring about one and a half hours before going to sleep and frequently waking up during sleep), sleep paralysis (the feeling of being unable to move while sleeping). sleep / drowsiness), parasomnia (nightmares, sleep walking or walking while sleeping, restless leg syndrome (feeling uncomfortable in the legs while sleeping), breathing problems (waking up due to shortness of breath and snoring), sleeping habits (delirious and feeling sleepy in the morning. The next stage is to assess the effectiveness of evidence-based research interventions for the elderly in overcoming sleep disturbances, **Conclusion:** which are expected to be used as role models as educational material for elderly patients in hospitals and communities in further research.

Keywords*: Sleep Disorders, Elderly, study intervention*

BACKGROUND

During the last few years, there has been a development of international study related to the problems experienced by the elderly. The process of aging is characterized by several physiological and functional changes in the body, including a decrease in the homeostatic balance and an increased incidence of pathologies or diseases that eventually lead to death. In the elderly, physiological changes have an effect on decreasing immune function (immunosenescence), and also negatively affect the nervous, cardiovascular, respiratory systems that can affect sleep. Physiological changes in aging also include changes in sleep (Santos et al., 2012).

In Henderson's theory (1966), sleep is one of the basic needs that must be met from the 14 basic human needs (Potter & Perry, 2005) moreover any disturbance in the sleep process will cause psychological problems as well as decreased cognitive abilities (Curcio et al., 2006). Sleep problems in the elderly are well known and have been linked to physical and psychological factors (Wu et al., 2012).

The most frequent changes in sleep caused by aging are increased frequency of waking at night and reduced periods or duration of sleep (Santos et al., 2012). Additional changes in sleep also include increased sleep time at stages 1 and 2, decreased sleep time at stages 3 and 4, decreased rapid eye movement (REM) during sleep, increased sleep fragmentation, decreased total sleep time, decreased sleep efficiency and increased sleep disturbances. , such as apnea and insomnia (Santos et al., 2012). Systemic inflammation that occurs in the elderly is also thought to affect complaints and sleep problems associated with increasing age (Santos et al., 2012) & (Gozal, 2009). This is associated with pathological conditions such as arteriosclerosis, dementia, osteoporosis, cancer (Weinert), and obesity (Gozal, 2009). Overall, these factors contribute to a poor quality of life for the elderly.

Health professionals' understanding of sleep mechanisms and its role in physiological changes and cognitive processes including memory function has improved with a large number of studies such as those mentioned above. However, most of the data from the study were collected in the young adult age group, while the process of aging or aging shows many changes in physiological or psychological or cognitive function (Rauchs, 2013). In addition, there is an increasing trend in the population of the elderly in society due to higher life expectancy in recent years in the world, including Indonesia, so that issues related to elderly people, especially the quality of life in old age, require special attention.

Previous research on the elderly in Makassar represented by the elderly population at the Nursing Home only explained that the problem of sleep disorders occurs in the elderly and may be influenced by several factors, but has not specifically examined the type of sleep disorder in the elderly. and management. Therefore, this study aims to identify the types of sleep disturbances in the elderly and how self-management is done to overcome these sleep disturbance problems. It is hoped that by understanding the types of sleep disorders, it can be recommended that the most appropriate management of sleep disorders for health workers.

Identification of Disturbances and Quality of Sleep in the Elderly. Sleep disturbance is an important problem that needs great attention for the elderly. Epidemiological studies have shown that the incidence of insomnia increases with age, including the inability to sleep or maintain sleep. Whereas sleep is the most influential factor on human health and is an important element in the circular cycle that plays a role in the rebuilding of physical and emotional strength. A decrease in the quality of sleep can reduce an individual's ability to manage stress so that he becomes sensitive or irritable. In addition, sleep deprivation can increase the risk of injury, falls, accidents, prolonged fatigue, slow wound healing, and interfere with function, feeling, thoughts, social relationships, career, motivation and health, which in turn has an impact on decreasing quality of life in the elderly. Insomnia can also decrease the function of the hypothalamus, cause hypertension, increase the risk of cardiovascular disease and have a negative impact on the function of the metabolic, endocrine, and immune systems.Previous research has shown that after headaches and indigestion, sleep disorders are the third most common problem for the elderly.

Epidemiological studies show that 12-45% of elderly people experience sleep disturbances where the prevalence is higher in elderly women than men. Especially in women who have menopause, there is 70% of the prevalence of elderly women. The sleep disorders most frequently complained of by the elderly include starting sleep late, walking during sleep, waking up quickly and easily, and drowsiness in the morning.

The sleep quality of the elderly was measured using the Pittsburgh Sleep Quality Index (PSQI) instrument. The PSQI was used to assess the sleep quality of participants several months prior to the study. This instrument consists of 19 personal items and 5 other items. The 19 items consist of 7 components (sleep quality, delay in falling asleep, the sleep duration, the sleep efficiency, sleep disorders, consumption of sleeping-inducing medications, the daily performances), and each component is given a score of 0-3 which will then be accumulated with a susceptible 0-21. The higher the score obtained, the worse the quality of sleep. Of the 8 articles reviewed and analyzed in this study literature, none included the number of frequencies (n) of respondents who experienced sleep disturbances, but the values listed were the average value (mena + SD). So that no data is presented in table form.

METHODS

Search strategy

This research is a literature study using research articles related to the topics studied in nationally and international accredited journals including PubMed, Scopus, Web of Science, Cochrane Library, Google Schoolar and OpenGrey.

Study Selection

The choosen articles were published in the last five years (2015-2020). There were 1,390 articles found in the search, 10 study articles were included in the final analysis with keywords elderly AND "sleep disorder" AND intervention. Then the assessment and identification of sleep disorders experienced by the elderly are carried out which is then continued by identifying research interventions that have been proven (Evidence-Based) to significantly address sleep disorders in the elderly.

RESULTS AND DISCUSSION

The article search results obtained 1.390 article consisting of 32 PubMed article, 8 Scopus article, 3 WOS article, 47 Cochrane Library article, 1300 Google Schoolar article. The identification 1338 article and 52 duplicate article removed, and selected 30 article. The inclusion 10 article significantly address sleep disorders in the elderly. The Analysis of Study Interventions on Sleep Disorders in the Elderly Show (Table 1).

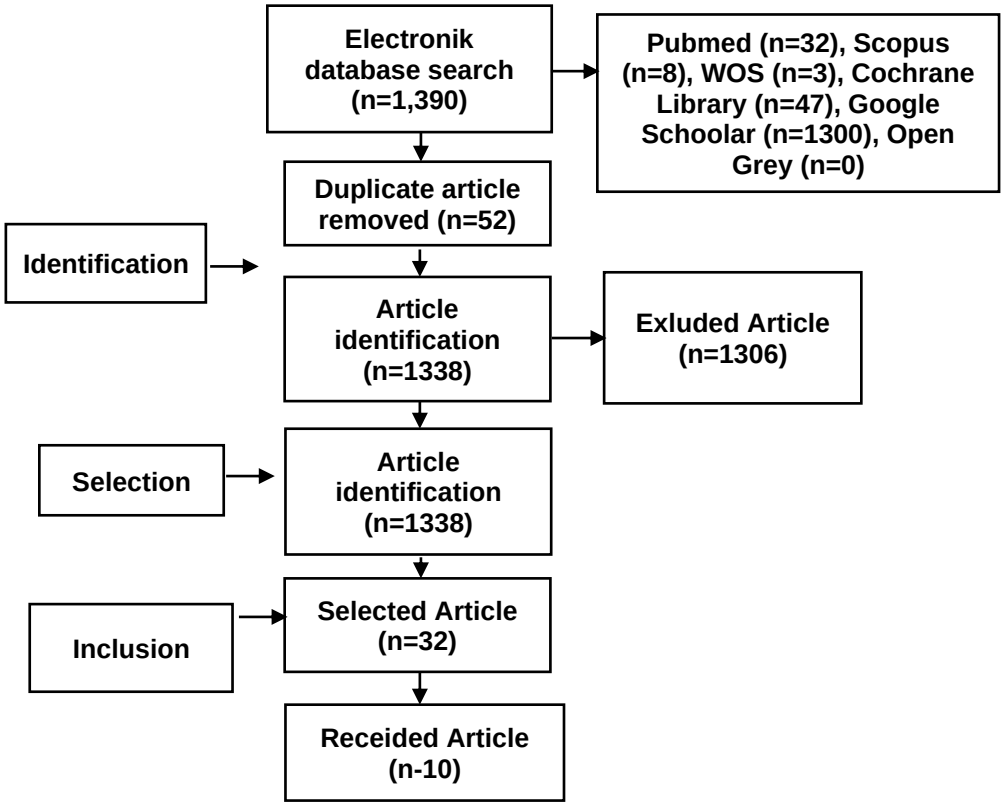

Figure 1: Flow Diagram

Table 1. Analysis of Study Interventions on Sleep Disorders in the Elderly

No.	Articles	Interventions	Explanation
1.	Yuan, et al. (2020)(Yuan et al., 2020)	Physical activity	Physical activity was measured by the Chinese version of the Physical Activity Questionnaire (IPAQ-S) which consists of 7 questions (6 items regarding physical activity), including metabolic activity: walking, moderate intensity activity, high intensity activity. Physical activity level per week = metabolic activity × frequency (days / week) × number of times per day (minutes / day).
2.	Eshaghi, et al. (2019)(Eshaghi et al., 2019)	Aerobic exercise and vitamin D supplements	During the research, respondents made an isocaloric diet according to their physical conditions. A daily intake of 1000 IU of vitamin D was determined for ATDG and VDG and performed 3 50-minute training sessions per week for 8 consecutive weeks based on Rock portone-mile walking / running tests with an intensity of 60-70% of the maximum pulse rate (maximal heart rate /MaxHR). CG carried out habitual daily routines throughout the study. Exercise intensity is monitored by pulse monitoring. A training session consists of 3 parts: warm-up (10 minutes with 20-30% MaxHR), 35 minutes of core training and 5 minutes of cool down. The entire session was beached by 2 exercise physiologists. Sleep quality was measured by the Pittsburgh Sleep Quality Index (PSQI) and the assessment of neurocognitive function was carried out using the Neuropsychological Test battery Vienna (NTBV), before and after the intervention at the Imam Khomeini International University Laboratory.
3.	Lemrasky, et al. (2019)(Lemrasky et al., 2019)	Education ofsleep hygiene	Sleep hygiene education includes: advice on avoiding sleep disturbance factors, a comfortable sleep situation, proper nutritional intake, and exercise to improve sleep quality, the effect of smoking on sleep, knowledge of herbs that can help sleep, behavioral intervention education: deep breathing techniques to improve sleep quality. relaxation, guided imagery, and muscle relaxation. Education is given in 5 sessions with a duration of 40 minutes for 12 weeks / 3 months. 40 minutes of sleep hygiene education The PSQI scale was measured in the intervention and control groups before the intervention and after 1 month of the intervention.
4.	Mohanty&Rupanjali (2019)(Mohanty & Rupanjali, 2019)	Light Therapy	There are 4 phases of research: pre intervention, intervention, post intervention, and follow up. Light therapy is given in the morning for 30 minutes with 10,000 LUX white LED light. The results showed that at the end of the intervention and during the follow-up process there was a significant change in sleep quality scores compared to before the intervention.
5.	Lee, et al. (2018)(Lee, 2018)	Diet: fruits and vegetables	This study used a database of the Chinese Longitudinal Healthy Longevity Survey (CLHLS) in 2014 which was collected for 3 years. Data were collected through face-to-face interviews and filling out a questionnaire. The results showed that there was an effect of regular consumption of fruits and vegetables

			on good sleep quality in the elderly which reduced the amount or duration of sleep from day to day.
6.	Diego-Cordero , et al. (2020)(Diego, 2020)	Spiritual and religious intervention	Of the total 3,257 articles obtained in the journal database search, 10 were analyzed. There are many techniques commonly used to treat insomnia or mental disorders associated with insomnia, including mantras, yoga, prayer, meditation, daily routine worship, psycho-religious interventions and exercises. The results of these interventions indicate a direct and indirect positive effect of spiritual / religious interventions on insomnia.
7.	Tamura & Tanaka (2017)(Tamura & Tanaka, 2017)	Sleep management interventions with self-help treatment: sleep health education using booklets, group work, light physical activity and a sleep diary	This study was a quasi-experimental study, with 51 participants divided into two groups: 28 for the intervention group and 23 for the control group. The intervention provided was self-help treatment through stages: participants were given health education about sleep, then divided into 4 groups to discuss together the sleep disorders they felt, they were asked to choose and practice one sleep promoting behavior for 2 weeks and to monitor progress , they fill in the sleep diary that has been provided. Light activity therapy that must be done is light stretching and abdominal breathing to increase sleep arousal. Meanwhile, the control group was asked to fill in a sleep diary without self-help treatment intervention The results of the self-help treatment intervention showed 4 (14.3%) classified as recovered from insomnia, 9 (32.1%) improved sleep quality, and the remaining 15 (53.6%) did not improve or worsen. While the control group, 1 (4.3%) recovered, 1 (4.3%) increased, and 21 (91.3%) did not improve or worsen, these results indicate that self-help treatment therapy has a clinically significant effect. than the control group
8.	Suzuki, Miyamoto, & Hirata, (2017)(Suzuki et al., 2017)	Non pharmacology therapy: sleep hygiene, stimulus control, Sleep restriction, Cognitive behavioral treatment, Bright light therapy	Several non-pharmacological therapies that are recommended for elderly people with insomnia are based on research results, namely 1). sleep hygiene: activity therapy / light exercise, pay attention to the bed environment (keep the bedroom dim and quiet and maintain a comfortable room temperature), eat regularly, limit fluid intake, avoid caffeine, alcohol and smoking 2). Stimulus Control: The stimulus for the elderly to go to bed when they are sleepy and about to sleep, the elderly must consistently sleep and wake up at the same time, and avoid excessive napping. 3). Sleep restriction. 4). Cognitive behavioral treatment: Identification of thoughts, beliefs, or incorrect knowledge about sleep and correct knowledge, identification of emotions, and sleep-related behaviors. 5). Bright light therapy: When the elderly are progressing in the sleep phase or wake up earlier, exposure to light or bright light therapy at night is recommended.
9.	Macleod, Musich, Kraemer, & Wicker(2018)(Macleod et al., 2018)	Non pharmacology therapy: Mindfulness, cognitive behavioral therapy, and chronic stress management	The database used in this literature study is PubMed, MeSH Terms with a total of more than 6,000 relevant articles, but which are topic-specific and 19 articles were analyzed. The results of a literature study indicate the need for a non-pharmacological therapeutic approach to overcome the problem of sleep disorders in the elderly to avoid the side effects of pharmacological treatment for sleep disorders, Mindfulness, cognitive

			behavioral therapy, and chronic stress management to be effective as a therapy for the elderly with sleep disorders.
10.	Sadler, Mclaren, Klein, Jenkins, & Harvey, (2015)(Sadler et al., 2015)	Cognitive behaviour therapy-Insomnia (CBT-I), Cognitive behaviour therapy-Insomnia-depression (CBT-I-D) and psychoeducation control group (PCG)	The study design was an RCT (a randomized control trial), in which 150 participants with an age limit of 65 were involved. Participants who met the inclusion criteria were randomly assigned to the CBT-I, CBT-I-D, PCG groups. Outcomes will be assessed at pre-intervention (week 0), post-intervention (week 8), and follow-up for 3 months (week 20). The interventions given to CBT-I are: session (1) Introduction, (2) Stimulus Control, Sleep restriction, (3) sleep hygiene, (4) relaxation, (5) relaxation, cognitive reframing (insomnia) (6) cognitive reframing (insomnia), (7) cognitive reframing (insomnia), (8) relapse prevention. CBT-I-D: session (1) Introduction, (2) Stimulus Control, Sleep restriction, (3) sleep hygiene, Behaviour activation (4) relaxation, Behaviour activation (5) relaxation, cognitive reframing (insomnia), (6) cognitive reframing (insomnia/depression), (7) cognitive reframing (depresssion), affirmations (8) affirmations, relapse prevention. Sedangkan intervensi PCG: session (1) Introduction, (2) Insomnia, (3) Sleep Health, (4) Sleep and mood, (5) sleep and mmod (6) Beliefs about sleep, (7) beliefs about sleep, (8) Summary The results showed that CBT-I & CBT-ID were more effective in treating insomnia and depression in the elderly than PCG, while CBT-I and CBT-ID both reduced insomnia and depression, CBT-ID was more recommended in elderly people with insomnia and depression. simultaneously.

Effectiveness of Interventions on Sleep Disorders From Research

Based on the literature study that has been carried out in this study, it is known that there have been many research interventions in an effort to overcome the problem of sleep disorders.Yuan et al., (2020) stated that about 20% of the elderly used drugs such as analgesics, anxiety-reducing or hypnotic drugs to sleep. However, this has side effects for the elderly, which is only temporary and reduces the Rapid Eye Movement (REM) phase that important for mental function and reducing tension. Moreover hypnotic drugs can cause dependence, so that if it is interrupted it will worsen the difficulty sleeping condition than before. Therefore, many studies have been conducted on non-pharmacological interventions to treat sleep disorders in the elderly, although the effectiveness of these methods is felt slower than using drugs. Another advantage of the drug-free treatment is that it does not have side effects such as dizziness, hypertension, or even dependence.

The ability to control sleep disorders can be achieved by identifying the main causes of sleep disturbances, taking the right measurements, and being aware of changing behavior. So that Lemrasky et al., (2019) examined the effectiveness of sleep hygiene education on sleep problems. Sleep hygiene education includes advice on avoiding sleep disturbance factors, a comfortable sleep situation, proper nutritional intake, and exercise to improve sleep quality, the effect of smoking on sleep, knowledge of herbs that can help sleep, education on behavioral interventions such as deep breathing techniques for relaxation, guided imagery, and muscle relaxation. Based on the intervention, there was an improvement in sleep, that is quality, duration, and daily functional disturbances that could be achieved through education with minimal costs. It is hoped that the effectiveness of this intervention will ultimately improve the quality of life of the elderly.

Then Yuan et al., (2020) described the effect of physical activity on sleep disorders in the elderly in China. The results of this study indicate that physical activity has a significant effect on improving sleep quality and indirectly on the quality of life of the elderly. This is because good quality sleep will have an impact on good mental and mental health. With a good mentality, the quality of life can improve. Physical activity show reduction depression and cognitive function in the elderly (Hu et al., 2019).

Eshaghi et al., (2019) more focused on examining physical activity as aerobic exercise which is also combined with the provision of vitamin D supplements in improving sleep quality. The results of this study indicated an improvement in neurocognitive function in the intervention group which had an impact on sensory cortex reorganization, increased efficacy of synaptic connections, increased activation of the nervous system, and decreased nerve inhibitor reflexes. This is because nutrition and physical activity can help with response time and information processing in the brain, which in turn helps improve psychomotor function that has decreased with age.

Related to nutritional intake as done by Eshaghi et al., (2019) & Lee, (2018) also examined the effect of fruits and vegetables on sleep problems. The results showed that the elderly who regularly consumed fruits and vegetables had better sleep quality than the elderly who rarely consumed fruits and vegetables. This is because fruits and vegetables are rich in vitamins and antioxidants. For example kiwifruit contains antioxidants and serotonin which can improve sleep quality and reduce sleep problems, fresh cherry fruit juice can increase melatonin production which increases sleep duration and quality, as well as other fruits. So that the importance of consuming fruits and vegetables can be emphasized in education for the elderly to be carried out independently so that sleep disorders can be overcome.

Mohanty & Rupanjali, (2019) made different interventions in their research. Light therapy is an intervention conducted in the elderly by providing 10,000 LUX LED light for 30 minutes in the morning. The results showed that at the end of the intervention and during the follow-up process there was a significant change in sleep quality scores compared to before the intervention.

Apart from the above interventions, there are other non-pharmacological interventions that have also been shown to be effective in overcoming sleep disorders in the elderly. Research conducted by Macleod et al., (2018) & Suzuki et al., (2017) states that sleep hygiene therapy, stimulus control, sleep restriction, cognitive behavioral treatment, bright light therapy, mindfulness, and chronic stress management are recommended to be used as therapy in the elderly who experience sleep disorders, especially insomnia. The results showed that this therapy was effective in improving the quality of sleep in the elderly.

Meanwhile, Tamura & Tanaka, (2017) conducted self-help treatment interventions and found that there was a clinical difference between those who were given self-help treatment interventions and those who were not. The results of the study showed that more respondents had improvement from their sleep disturbances than the control group. These results indicate that self-help treatment therapy has a clinically significant effect compared to non-self-help treatment therapy.

The research of Sadler et al., (2015) specifically examines the effectiveness of cognitive behavior therapy (CBT). CBT intervention is more specified into 3 categories: CBT-Insomnia, CBT-Insomnia-Depression and Psycho-Education Control Group (PCG). The results showed that CBT-Insomnia & CBT-Insomnia-Depression was more effective in treating insomnia and depression in the elderly than PCG (Psycho-Education Control Group), while CBT-I and CBT-ID both reduced insomnia and depression, therapy is recommended. used the CBT-ID intervention in elderly concomitant with insomnia and depression

Some of the non-pharmacological interventions above can be recommended interventions for elderly people who experience sleep problems. Non-pharmacological therapy is recommended even though the effectiveness of the method is slower than pharmacological therapy, but it minimizes the side effects of treatment in the very risky elderly who have physically decreased their body function.

CONCLUSION

There is an increasing trend of the older population in society due to higher life expectancy in recent years, and old age is not an important issue, but healthy aging and quality of life during old age are issues that need special attention. Therefore, the scientific study of sleep disorders as one of the most common problems of the elderly that can affect their quality of life should be taken into account by health professionals involved in public health.

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