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Factors Influenced the Quality of Sleep among Patients with Coronary Artery Bypass Graph: A Literature Review

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Abstract. Coronary heart disease is a condition of narrowing the coronary artery lumen due to fat accumulation, which causes reduced blood flow. One of the interventions to overcome the blockage is surgical coronary artery bypass graft (CABG). CABG can help patients overcome obstructions in the coronary arteries. However, CABG can cause disturbances in sleep patterns that can reduce the quality of life of patients. The purpose of this paper is to find out what factors influence sleep quality in post CABG patients. This paper is a literature study of several databases in ELSEVIER, PROQUEST, EBSCO, PMC, JMH, JMC. The result found that sleep quality in post CABG patients was influenced by age, sex, emotional distress, the effect of treatment, surgery, and comorbidity, and environmental factors. Nurses need to improve their ability to conduct sleep quality assessments in patients after CABG patients using the international sleep quality assessment format.

Keyword: Coronary heart diseases, CABG, sleep quality

INTRODUCTION

Cardiovascular disorders are currently a global problem. World Health Organization (WHO) (2020) reported 17.5 million people in the world had died from cardiovascular disease, or 31% of 56.5 million deaths worldwide. More than 3/4 of mortality from cardiovascular disease occur in low-middle income countries. Of all deaths from cardiovascular disease, 7.4 million (42.3%) of which were caused by Coronary Heart Disease (CHD) and 6.7 million (38.3%) caused by stroke. At the same time, Health Data Research (2013) explains that the

highest prevalence for cardiovascular disease in Indonesia is CHD, with a prevalence of 1.5% (1).

Coronary heart disease occurs when the lumen of the arteries narrows due to fat (atherosclerosis), which causes reduced blood flow to the coronary arteries (2). CABG, or what is known as Coronary artery bypass graft, is open-heart surgery where some blood vessels are grafted from the aorta to a blocked coronary artery that aims to help increase blood supply to the heart (3). Although cardiothoracic surgery can increase the life expectancy and quality of life of patients with cardiovascular and thoracic diseases, the quality of life after surgery is still influenced by many factors. One essential aspect of quality of life is sleep quality (4). Good sleep quality is known to be a predictor of good mental and physical health (5).

An understanding of the factors that influenced the recovery process after surgery can reduce morbidity and mortality after surgery (6). Enough sleep is essential for physical and psychological well-being. Sleep disorders can damage cognitive function, memory, mood, metabolic functions, and inflammatory responses. This change can be seen after several nights of lack of sleep, which is sleeping less than 5 hours. In fact, in healthy people, the recommended sleep is 7 to 8 hours.

Sleep disturbance settings are found in patients after CABG to affect the quality of life of patients and the well-being of patients (4). Sleep disorders can occur due to many things, such as lack of sleep duration, sleep disturbances due to environmental factors, physical discomfort, or the presence of specific sleep disorders (7). In addition, in post-surgical cases, sleep disorders can be caused by many things such as pain, environmental factors (noise, light, nursing procedures, and drug administration). Other factors associated with sleep quality, such as pain-related post-operative, immobilization, and analgesics used during the post-operative period (8). Sleep disturbances in post-operative patients can cause various problems such as fatigue, hypoxic episodes, hemodynamic instability, cardiovascular issues, and mental status disorders.

OBJECTIVE

This study aimed to discuss the factors that affect sleep quality in post-cardiac surgery patients.

METHOD

The study was applied by using the literature approach. The articles were obtained from several databases, including ELSEVIER, PROQUEST, EBSCO, PMC, JMH, JMC databases, with the help of Google Scholar and Remote Lib UI. The keyword used to search the relevant articles such as "quality of sleep," "CABG," "cardiac surgery," "; post-operative".

The inclusion criteria were 1) articles published from 2008 to 2018, 2) English language, 3) focus on the quality of sleep among post-cardiac surgery patients. The inclusion criteria are literature that addresses all CAD patients who have CABG surgery. The exclusion criteria are all literature that discusses other types of open-heart surgery, such as heart valve surgery or other anatomical improvements.

RESULTS

CAD is characterized by the narrowing of the coronary arteries caused by plaque (9). One of the best interventions to treat patients with CAD is the CABG procedure. CABG is an

open heart surgery where a part of a blood vessel is transplanted from the aorta into the coronary artery by passing through the coronary arteries that are transferred to increase blood supply to the heart (2). Sleep is a basic need for humans as a means for energy conservation, well-being, and maintaining heart function (3). In addition, sleep is a complex and crucial physiological process.

Sleep quality is the sum of total sleep time (TST), sleep onset latency (SOL), degree of fragmentation, whole wake time, sleep efficiency, and sleep-disturbing events such as spontaneous stimulation or apnea period (10). Many studies suggest that sleep patterns are strongly influenced by various conditions, such as the preoperative phase, hospitalization, and recovery phases. In addition, deprivation of total sleep time, decreasing sleep efficiency, fragmented sleep, and increased daytime napping are effects of inadequate sleep quality (5).

Some factors can affect sleep quality, such as age, gender, emotional distress, treatment, surgery, comorbidity, and environmental factors. In general, many studies state that older adults have more time to sleep during the day, wake up more often, wake up long after a deep sleep, wake up earlier than younger adults. In other words, sleep efficiency can decrease with age (11). A community study showed that 23% - 34% of older adults reported symptoms of insomnia, 7% -15% said feeling rarely or never resting, and other sleep complaints associated with several respiratory symptoms, physical disability, drug use, depression, and poor health status (12).

Sleep disturbances are reported to increase in old age. As many as 50% of older people over the age of 65 are said to have sleep problems. Another study states that there is a very significant influence between age and sleep quality (3). In the elderly, there is a decrease in total sleep, decreased sleep efficiency, and more often wake up at night due to a reduction of sensory ability. That way, circadian rhythm sensitivity is difficult to maintain (8). Also, there is a reduction in the nervous system, which affects delta waves in NREM II and IV sleep. In addition, there is a central nervous system deficit resulting in a decrease in outward alarm reactions and biorhythm dysfunction and a reduction in the release of melatonin substances.

The second factor is gender. A study reports that gender influences sleep quality. In healthy women of adulthood have shorter sleep latency, higher sleep efficiency, and fewer awakenings after deep sleep but experience more significant daytime drowsiness than men (12). In contrast, other studies suggest that hormonal conditions, particularly physical changes in puberty, pregnancy, to menopause that occur during a woman's lifetime can cause sleep disorders that cause health problems. Sleep disorders such as restless leg syndrome (RLS), obstructive sleep apnea (OSA), and insomnia are more common in women during their lifetime so that they can affect the woman's social life (13). Another study states that women's sleep quality is worse than that of men. If a man experiences sleep disorders, more is caused by activity, while women are affected by hormonal changes (10). Estrogen and progesterone receptors are very influential on circadian rhythms, so women who have entered the menopause phase will be more susceptible to sleep disorders (11).

The third factor that affects sleep quality is emotional distress. Emotional distress includes anxiety and depression, a common thing that occurs in patients who have heart surgery (12). The results of the study reported that individuals with emotional distress reported experiencing unhealthy sleep for 24 hours of their daily cycle also experienced harmful sleep duration (<7 hours or> than 8 hours) (14). Pain arising after surgery, especially at night, the use of analgesic therapy during the post-operative period also dramatically affects the patient's sleep quality (13). Furthermore, comorbidities also have a relationship with sleep quality, in which patients with comorbidities have lower sleep quality than healthy people (6).

Another factor affecting sleep quality is the management of actions taken during the CABG surgical procedure, namely the pump and off-pump method. The use of the "off-pump" process during cardiac surgery, has been shown to reduce neurological dysfunction associated

with the use of heart bypass machines and reduce the length of stay and reduce the risk of sleep disorders due to average circulation to the brain compared to patients using the procedure "on-pump " In addition, other surgical methods such as minimally invasive direct coronary artery bypass (MIDCAB), also affect the patient's sleep pattern, due to differences in pain and activity recovery patterns (12).

Environmental factors can also reduce the quality of sleep in post-cardiac surgery patients. Noise levels from various medical devices, drugs such as vasopressors, sedatives, and analgesics, and bright room light can disrupt sleep for patients recovering from heart surgery (15). Besides, a nighttime care routine (NCRI) performed by nurses, such as conducting the patient assessment, administering drugs, diagnostic procedures or laboratory tests, and post-surgical training can trigger sleep disturbances (16).

DISCUSSION

Sleep quality plays an essential role in humans, especially in post-cardiac surgery patients. Many studies have examined the quality of sleep in post-cardiac surgery patients. One study compared patients who slept less than 5 hours with those who slept for more than 8 hours, They found that patients who slept less than 5 hours were closely associated with an increase in heart rate compared with patients who slept more than 8 hours (17).

Other studies say that some of the effects of sleep disorders will occur if this sleep disorder occurs at a long time or is chronic, but in post-surgical conditions, sleep disorders can occur acutely. Considering many things that result from sleep disorders such as cognitive dysfunction (delirium), perceptions are getting worse for pain, psychomotor disturbances, affective disorders towards metabolic disorders. Health workers, in particular, nurses generally understand the quality of sleep in perioperative conditions

In Indonesia, the number of people with CHD is increasingly experiencing a significant increase. Along with this, the number of CABG operations has also increased from year to year. Increasing the number of patients undergoing CABG, it is expected that the quality of life of patients with CHD will continue to improve the quality of the patient's sleep.

CONCLUSION

Sleep is a human need and a complex physiological process, especially in post-cardiac surgery patients. Enough sleep is essential for physical and psychological well-being. Lack of sleep can cause cognitive impairment, memory, mood, metabolic function, and inflammatory response so that there is a need to study, intervene, and implement nursing to support the creation of adequate sleep patterns in patients pre and post-surgery maintaining and improving sleep quality in patients.

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