



NON-PHARMACOLOGICAL INTERVENTIONS IN HEART FAILURE PATIENTS TO IMPROVE SLEEP QUALITY

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Research Report

ABSTRACT

Introduction: The Symptoms of Paroxysmal Nocturnal Dyspnea (PND) in patients with heart failure are shortness of breath at night which may appear suddenly causing the patient to wake up and will affect people's quality of sleep. One of the treatments that can be given to patients with poor sleep quality is by providing non-pharmacological interventions. **Methods:** This study uses a literature review design. The database used in the literature is Google Scholar, Science Direct and PubMed in which the terms are selected and limited with the range 2011-2021 which can be accessed in PDF format. **Results:** The results obtained five articles of non-pharmacological interventions that can be given to treat the problem of sleep disorders in heart failure patients: massage therapy, position therapy; and Cognitive Behavioral Therapy (CBT). Sleep disorder is not handled properly, it can affect the physical condition of this heart failure patient. Interventions massage therapy are hand, back and foot massage to improve sleep quality in heart failure patients with pain and environmental problems. Heart failure patients, there is a relative change in hemodynamic status so it is necessary to take one of the actions by providing nursing interventions in the form of a right lateral rest position for nursing. Anxiety conditions are one of the mental problems that occur in heart failure patients and CBT interventions can be given. **Conclusions:** These three therapies are effective in overcoming sleep disturbances and improving sleep quality for heart failure patients.

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INTRODUCTION

The non-communicable diseases are one of the health problems that causes of death and as a global threat to economic growth in Indonesia. The control non-communicable disease program is focused on 4 main diseases that cause 60% of deaths, namely cardiovascular, diabetes mellitus, cancer and chronic obstructive pulmonary disease (Directorate of P2PTM RI, 2019). World Health Organization data in 2015 showed that 70% of deaths in the world were caused by non-communicable diseases (39.5 million out of 56.4 deaths). Of all deaths due to non-communicable diseases (NCD), 45% were caused by heart and blood vessel disease, which was 17.7 million out of 39.5 million deaths (Directorate of P2PTM RI, 2019). The prevalence of heart disease in Indonesia is more than 2 million people (PERKI, 2019), the prevalence of Heart Failure based on doctor's diagnosis in Indonesia in 2013 was 0.13% or an estimated 229,696 people, while based on doctor's diagnosis/symptoms it was 0.3% or it is estimated that around 530,068 people (Pusdatin Ministry of

Health of the Republic of Indonesia, 2014). Some of the symptoms of heart failure that often appear are shortness of breath, swelling (edema) of the abdomen and/or legs, fatigue, etc. Symptoms of Paroxysmal Nocturnal Dyspnea (PND) are shortness of breath at night which may appear suddenly and cause the patient to wake up so that it will affect the quality of sleep of patients with heart failure (Udjianti, 2011).

Sleep is a basic human need and must be met adequately in order to maintain body homeostasis. One of the factors that affect sleep quality is disease, illness that requires more sleep. In addition, the symptoms of PND in patients with heart failure cause inadequate sleep needs (Potter & Perry, 2010). Unfulfilled sleep needs will have an impact on physical and psychological health, for example the body looks weak, easily tired, restless, irritable, unable to concentrate, and so on.

Inadequate sleep needs will affect the quality of life, as the results of research conducted by Adisza in 2015 stated that there is a relationship between sleep quality and quality of life of heart

failure patients. This is also in line with other studies in hypertensive patients and those undergoing hemodialysis (Listyoningsih, 2017).

Patients with heart failure often experience poor sleep quality. A heart that has experienced a disturbance if accompanied by poor sleep quality. It will cause the heart's burden to be heavier, the physical and psychological recovery process decreases so that it aggravates the illness and will prolong the day of hospitalization in patients thereby increasing the morbidity rate (Agusrianto, Manggasa, et al. 2020).

Treatment of heart failure patients in order to get good sleep quality requires proper handling so that patients get good sleep quality. One way of handling that can be given to patients with poor sleep quality can be non-pharmacological and pharmacological interventions with drug consumption. Non-pharmacological intervention is one of the independent nursing actions to reduce the symptoms felt by patients (Potter & Perry, 2010).

Several research experiments also explain that non-pharmacological interventions performed on patients with heart failure affect the quality of sleep of patients with heart failure, namely interventions for adjusting sleeping positions, back massage, etc. Based on this description, the authors are interested in

researching related to non-pharmacological interventions to improve the sleep quality of heart failure patients from various published literature.

The purpose of the study was to identify the effect of non-pharmacological interventions on the sleep quality of heart failure patients.

MATERIALS AND METHODS

This study uses a literature review design, namely a critical study or study conducted on a topic that has been written by a scientist or expert in the topic field. The database used in the literature search through Google Scholar, Science Direct and PubMed with terms selected and limited to the 2012-2022 range which can be accessed in full text in PDF format. The method used to search for studies is to search for a combination of keywords sleep quality, heart failure, non-pharmacological interventions. Articles that match clinical questions are then analyzed through a critical appraisal tool using the CASP Critical Appraisal Skills Program).

The quality of the assessment of the study was not carried out by peer reviewers, only individual assessments were carried out by the authors so that the subjectivity of this assessment was very high. The results of the study assessment are displayed in tabular form.

RESULTS

The search results obtained 5 (five) articles sourced from Google Scholar, Science Direct and PubMed. There are 4 (four) articles with the type of quasi-experimental research, and 1 (one) article with the type of Randomized Controlled Trial (RCT) research. The research locations were carried out in several countries, namely Indonesia, India, and the United States.

Table 1. Results searching non-pharmacological intervention articles on improving the sleep quality of heart failure patients

No	Title and Year	Author	Method	Samples	Intervention	Measurment	Data analysis	Result
1	Efektivitas Terapi Foot Massage Dan Hand Massage Terhadap Kualitas Tidur Pada Pasien Chf Di Ruang ICU RSUD 45 Kuningan (2019)	Ujeng, Nurmalaningrum, Yana Hendriana	Quasi eksperiment pretest and post test with control group design.	A sample of 30 respondents in 2 groups with details of 15 people as the treatment group and 15 people as the control group	The treatment group was in the form of foot massage therapy, while the control group was given hand massage therapy	Sleep quality questionnaire (PSQI).	Using the Wilcoxon alternative test to analyze the difference between the two means on the subject before and after being given foot massage and hand massage therapy. After that, an independent t test was conducted to analyze the difference in mean between the treatment group and the control group after being given foot massage	Based on the results of the Wilcoxon statistical test, the p-value in the intervention group for foot massage therapy was 0.001 <0.05, so there was an effect between before and after foot massage therapy. Meanwhile, in the intervention group for hand massage therapy, a p-value of 0.003 <0.05 was obtained, so that there was an influence between before and after hand massage therapy, so that the provision of both interventions could improve sleep quality. Independent sample t-test test obtained p-value 0.141 > 0.05; so that there was no significant difference between the foot massage and hand massage therapy groups.

							and hand massage therapy.		
2	Pengaruh Terapi Posisi Lateral Kanan Terhadap Kualitas Tidur Pasien Gagal Jantung Di Rsup M Djamil Padang (2019)	Marnila Yesni	Quasi Experiment with pre and post test control group	15 respondents in the intervention group and 14 respondents in the control group	Nursing intervention therapy right lateral position	RCSQ Questionnaire (Richards Campbell sleep questionnaire)	Independent T test	There was a significant difference in the difference in sleep quality between the right lateral position group and the control group with a value (p value = 0.001).	
3	Pengaruh Posisi Tidur Semi Fowler 45° Terhadap Kualitas Tidur Pasien Gagal Jantung Di Ruang ICCU RSUD dr. Soedarso Pontianak (2017)	Sukainah Shahab, Suhaimi Fauzan, Ichsan Budiharto	Quasi-experiment with pre-post test controlled group	32 respondents with a distribution of 16 people in the intervention group and the control group	45° semi fowler sleeping position	Measurement of sleep quality using the Richard Campbell Sleep Questionnaire.	Unpaired T Test	The level of sleep quality in the intervention group got p value = 0.000 and the control group got p value = 0.184. In the comparison of sleep quality between the intervention and control groups, the value of p = 0.050. There is a difference between the sleep quality of the two groups that have been given a 45° semi-Fowler position	
4	Effectiveness of Back Massage on Sleep Pattern among Patients with Congestive Cardiac Failure (2017)	Amol Sable, Thangaraj Sivabalan, Akshaya Narayan Shetti	Quasi-experimental study	Thirty patients	CCF	Techniques in back massage were (a) effleurage, (b) stroking, (c) kneading, (d) tapotement with a total time of 20 min (5 min each), three times in a day (i.e., 8 am, 3 pm, And at 8 pm)	The Pittsburg sleep quality Index.	Paired t.test was calculated to Analyze the difference in sleep quality before and after the Back massage.	Pretest for sleep quality was 9.50 (3.14), Indicating poor sleep quality. Posttest, the mean score was 4.47 (0.89), indicating good quality sleep. Eleven patients had >8 h of sleep, 15 patients had 6–8 h of sleep, whereas 4 patients had less than 6 H of sleep pretest. Posttest, 22 patients had >8 h and the remaining had 6–8 h of sleep. Back massage technique is safe and cost-effective in ccf patients, by which the quality and duration Of sleep is improved. It can be a part of the standard treatment.
5	Effects of Cognitive Behavioral Therapy for Insomnia on Sleep-Related Cognitions Among Patients With Stable Heart Failure (2019)	Nancy S. Redeker, Sangchoon Jeon, Laura Andrews, John Cline, Vahid Mohsenin & Daniel Jacoby	Randomized controlled trial (RCT)	In groups to group CBT-I ($n = 30$) or attention control (HF self-management education, $n = 21$)	Cognitive behavioral therapy for insomnia (CBT-I)	Insomnia Severity Index, Pittsburgh Sleep Quality Index, Dysfunctional Beliefs and Attitudes about Sleep (DBAS) and Sleep Disturbance Questionnaires (SDQ), and self-reported fatigue, depression, anxiety, and sleepiness	A bootstrapping approach, and Pearson correlations.	There was a statistically significant group \times mult time effect on DBAS. DBAS mediated the effects of CBT-I on insomnia severity and partially mediated CBT-I effects on fatigue. Improvements in dysfunctional cognitions were associated with improved sleep quality, insomnia severity, sleep latency and decreased fatigue, depression, and anxiety, with sustained effects at six months Improvement in dysfunctional sleep-related cognitions is an important mechanism for CBT-I effects among HF patients who are especially vulnerable to poor sleep and high symptom burden.	

DISCUSSION

Heart failure is a condition of abnormal heart function in the form of failure to pump blood so that it is unable to meet the needs of body tissues (Dumitru, 2021). One of the impacts that occur as a result of heart failure to pump blood is pulmonary edema which causes diffusion disorders in the lungs so that patients with heart failure feel symptoms of shortness of breath. This shortness of breath can occur at night while the patient is sleeping which is called Paroxysmal Nocturnal Dyspnea (PND).

According to research by Fachrunnisa et al. (2015) and Redeker et al. (2019), there are several condition factors related to sleep quality in heart failure patients, namely anxiety, Paroxysmal Nocturnal Dyspnea (PND), environment and pain. Decreased sleep quality in patients with heart failure requires good treatment so that the patient's sleep needs can be met. Some of the interventions that can be given according to several studies are as follows:

1. Hand, Back and Foot Massage Therapy

Factors that affect the quality of sleep in heart failure patients include pain and the environment. Interventions that can be given to improve sleep quality in heart failure patients with pain and environmental problems are foot massage and hand massage. Foot massage is a form of massage on the feet that is based on the premise that discomfort or pain in specific areas of the feet is related to disorders of the body part, while hand massage is a form of massage on the hands based on the premise that discomfort or pain in specific areas of the hands is associated with disorders of the body part Stillwell in Ujeng et al. (2019). Back massage technique is safe and cost-effective in heart failure patients (Sable et al., 2017).

A touch of foot and hand massage therapy can activate parasympathetic activity which will provide neurotransmitter signals to the brain, internal organs, and bioelectrical throughout the body. This signal sent to the brain will flow alpha waves in the brain (Guyton, 2014 in Ujeng et al., 2019). Alpha waves will relieve a person's stress so that the person feels relaxed and helps muscle contractions to release brain chemicals in the form of neurotransmitters that stimulate the Reticular Activating System (RAS) in releasing serotonin, acetylcholine and endorphins hormones that can improve comfort and relaxation. Relaxation and perceived comfort can reduce cortisol production in the blood so as to provide a balance of emotions and mental tension that can improve sleep quality (Aziz, 2014 in Ujeng et al., 2019).

2. 45° Right Lateral and Semi Fowler Position Therapy

Giving body position can improve patient's welfare and comfort (Bulechek, 2013). The right lateral position is an inclined position towards the right. In heart failure patients, there is a relative change in hemodynamic status (heart rate, respiratory rate, diastolic blood pressure, systolic blood pressure, oxygen saturation and mean arterial blood pressure) so it is necessary to take one of the actions by providing nursing interventions in the form of a right lateral rest position for nursing (Febrina 2014 in Yesni, 2019). Heart failure patients can experience a heavy heart workload by giving the right lateral position to reduce the workload of the heart in heart failure patients and can reduce sleep apnea which often interferes with sleep quality.

According to Chen & Kuo, 1997; Sharad J, 2013 in Yesni, (2019), explains that several mechanisms that encourage the activity of the Vagus Nerve when a person lies in the right lateral position are:

- 1) The SA node receives its main innervation via the right Vagus Nerve, the right Vagus Nerve in the neck will be stimulated by periodic massage of the carotid artery pulsation at rest in the right lateral position;
- 2) When lying down, the right lateral position will be advantageous to the anatomic position of the right atrium because it causes decreased venous return from the superior and inferior vena cava;
- 3) Gravity can increase the workload of the heart when lying to the left, while lying to the right will increase vagal activity (parasympathetic nerves);
- 4) In the right lateral resting position will prevent upper airway obstruction due to pushing the tongue and palate backwards which can cause occlusion of the nasopharynx and oropharynx when the patient is sleeping, so the patient will feel comfortable when sleeping in this position.

According to Melani, 2021 in Shahab et al., (2016) explained that the 45° sleeping position can produce better sleep quality than the 30° angle sleeping position. The semi-Fowler's sleeping position with an angle of 45° results in better sleep quality for patients with heart problems (Sulistyowati, 2015 in Shahab et al., 2016). The study was strengthened by Shahab et al. (2016), explaining that giving a 45° semi-Fowler sleeping position uses gravity to help breathing, so that oxygen enters the lungs more optimally so that patients can

- breathe more freely and will reduce the discomfort felt when Want to sleep.
- Cognitive Behavioral Therapy (CBT) is psychotherapy that combines behavioral therapy and cognitive therapy that is proven to be effective for dealing with various problems such as depression, anxiety disorders, mental health problems. CBT is one of the factors that affect the quality of sleep in heart failure patients is anxiety (Fachrunnisa et al., 2015). According to Redeker et al. (2019), anxiety conditions are one of the mental problems that occur in heart failure patients and Cognitive Behavioral Therapy (CBT) interventions can be given. According to Hapsari and Kurniawan Cognitive Behavior Therapy (CBT) is effective for improving sleep quality in insomniacs in early adulthood. Cognitive behavioral therapy (CBT) focuses on how a person thinks about situations and helps people understand the thoughts, feelings, and attitudes that influence behavior (Alavi et al., 2017 in Pangaribuan & Sari, 2020)

CONCLUSION

Several non-pharmacological interventions can be given to treat the problem of sleep disorders in heart failure patients, namely massage therapy in the form of hand, back and foot massage; positional therapy in the form of a 45° right lateral and semi-fowler position; and Cognitive Behavioral Therapy (CBT). These three therapies are effective in overcoming sleep disorder and improving sleep quality in heart failure patients.

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