

THE SLEEP QUALITY OF CONGESTIVE HEART FAILURE PATIENTS WHO EXPERIENCE DYSPNEA

Kasron¹, Susilawati², Wishnu Subroto³

¹Nursing Science, High School Of Health Al-Irsyad Al-Islamiyyah, Indonesia

²Midwifery Diploma, High School Of Health Al-Irsyad Al-Islamiyyah, Indonesia

³Physiotherapy Diploma, High School Of Health Al-Irsyad Al-Islamiyyah, Indonesia

¹kasronrw@gmail.com; ²susilawatimdf@gmail.com; ³subrotowishnu@gmail.com

Abstract—Congestive Heart Failure (CHF) is a terminal disease that causes a variety of very disturbing clinical manifestations such as dyspnea. Dyspnea in CHF patients can cause a sleep disorder such as Sleep-disordered breathing (SDB). The aim of study was to determine the quality of sleep in patients with congestive heart failure who experience dyspnea. The research method uses descriptive studies. Sampling method by accidental. Measurement of dyspnea with a modified Borg scale. Univariable analysis on the variables studied. The results showed that the dyspnea score was 4.2 ± 0.9 , the green dyspnea category was 62.5% dominant, the most dominant sleep quality was the very poor category 56.25%. The conclusion shows that the most dyspnea category is in the green category, the dominant sleep quality is very bad, the sleep quality is very bad for male respondents as much as 77.78%, experienced by high school respondents, experienced by respondents in grade CHF III, experienced by respondents in the green dyspnea category. Further research is needed to improve sleep quality in people with CHF who experience dyspnea.

Keywords— “Congestive Heart Failure”, “dyspnea”, “sleep”

INTRODUCTION

Congestive Heart Failure (CHF) is the inability of the heart muscle to pump a certain amount of blood to meet the body's metabolic needs. CHF is a cardiovascular condition in which the heart cannot pump blood adequately to meet the metabolic needs of body tissues [1]. Some of the risk factors for heart failure are smoking, lack of physical activity, changes in diet, being overweight, hyperlipidemia, diabetes, hypertension, age, gender and heredity. Based on research, it is known that the main causes of CHF are hypertension and coronary artery disease. CHF is the final stage of all heart disease and is the cause of increased morbidity and mortality in cardiac patients. Based on data from the World Health Organization (WHO) the risk of death from heart failure ranges from 5-10% per year in mild heart failure which will increase to 30-40% in severe heart failure [2].

CHF disease increases with age development, the prevalence of CHF in the world is around 1% in people aged 50-59 years, 10% at age more than 65 years, and 50% at age more than 85 years. In developing countries the prevalence of CHF is around 1-2% of the adult population. The prevalence increases by more than 10% at over 70 years of age. The prevalence of CHF in Indonesia is 0.13%, the highest is in Yogyakarta 0.25%, followed by East Java 0.19%, and

the third is Central Java 0.18%. Based on gender, the incidence of CHF in men was 0.1% and women were 0.2%. Based on patient age, the incidence of CHF at the age of 15-34 years was 0.07%, age 35-54 years 0.28%, 55-74 years 0.87%, more than 75 years 0.41%. [3].

Dyspnea in CHF patients can appear as dyspnea on exertion, orthopnoea or paroxysmal nocturnal dyspnoea. Percent of symptoms of shortness of breath, dyspnoea (52%), orthopnoea (81%), paroxysmal nocturnal dyspnoea (76%). Dyspnea will worsen if the CHF patient has anemia and pulmonary edema. [4], [5]

The mechanism underlying dyspnea is very complex, including the hypothesis that causes dyspnea is a decrease in cardiac output (COP) that occurs during activity in CHF patients which results in respiratory muscle ischemia and ultimately causes respiratory muscle fatigue. Research using infrared spectroscopy, is known to show increased diaphragmatic muscle activity and significant deoxygenation of the accessory respiratory muscles during the activity of CHF patients which results in increased frequency of activity of the main respiratory muscles and fatigue of the accessory respiratory muscles. Increased respiratory muscle activity and respiratory muscle weakness are sufficient to evoke the sensation of dyspnea in CHF patients [6]. Dyspnea disorders in patients with CHF often cause limited activities of daily living, reduced functional capacity, can cause sleep problems such as insomnia hypnopnea to apnea [7]. Sleep disturbance in CHF patients caused by dyspnea is referred to as Sleep-disordered breathing (SDB) [8]. Determination of a person's sleep quality can be measured through an instrument. The instrument that can be used to determine a person's sleep quality is the Pittsburgh Sleep Quality Index (PSQI) questionnaire. (Shahid, Wilkinson, Marcu, & Shapiro, 2011) (Hanifa, 2016). The results of previous research by researchers on dyspnea showed that patients with CHF had a dyspnea score of 4.2 ± 0.9 using Modifications of Borg scales to measure dyspnea [9]. So, with the above background, the researcher wanted to research the sleep quality of Congestive Heart Failure Patients with dyspnea.

METHODOLOGY

The research was conducted at the Islamic Hospital Fatimah Cilacap, internal medicine room. This type of quantitative research with a descriptive study approach. Questionnaire Modifications Of Borg Scales and Pittsburgh Sleep Quality Index (PSQI) were used to determine dyspnea and sleep quality of respondents. Sampling using accidental sampling method by selecting all individuals met during the 1 month running in July 2020, the study was conducted on 16 respondents. Analysis using descriptive analysis.

RESULT

The study was conducted on 16 respondents who suffered from CHF. The following is a description of the characteristics of the research respondents.

Table 1
Characteristics of CHF Patients With Dyspnea

No	Variable	Total (n=16)
1	Age (years)	57,63 ± 4,3
2	Gender	
	Male	12 (75%)
	Female	4 (25%)
3	Education	
	Elementary School	3 (18,75%)
	Junior High School	6 (37,50%)
	Senior High School	7 (43,75%)
4	CHF Grade	
	Grade II	5 (31,25%)
	Grade III	11 (68,75%)

From the table, it is known that the average age of the respondents is 57.63 years with a standard deviation of 4.3 years, the sex is mostly male 12 people (75%), most of the education is high school 7 people (43.75%), and most of them are at grade NYHA II 11 people (68.75%).

Table 2
Dyspnea Score

Variable	N	Mean (SD)	Median (Min-Max)
Dyspnea	16	4,2±0,9	4 (3-6)

From the table, it is known that the dyspnea score is 4.2 with a mean and a standard deviation of 0.9, and the mean value is 4 and the lowest and highest values are at 3 and 6.

Table 3
Dyspnea Category (n = 16)

Color Category / MBDS Score	F	%
Blue (0-1)	0	0
Green (2-4)	10	62,5
Pink (5-7)	6	37,5
Red (8-10)	0	0

MBDS: Modification Borgs Dyspnea Scale

From the table, it is known that the most dyspnea category is in the green category with a total of 10 respondents (62.5%).

Table 4
Sleep Quality of CHF Patients (n = 16)

Sleep Quality Level	F	%
Very good	0	0
Good	0	0
Not good	7	43,75
Very bad	9	56,25

From the table it is known that the most dominant category of sleep quality is the very bad category with 9 respondents (56.25%).

Table 5
Sleep Quality Based on Gender Characteristics (n = 16)

Sleep Quality Level	Male		Female	
	F	%	F	%
Very good	0	0	0	0
Good	0	0	0	0
Not good	5	71,43	2	28,57
Very bad	7	77,78	2	22,22

From the table it is known that the category of very poor sleep quality was experienced by male respondents as many as 7 respondents (77.78%) and experienced by female respondents as much as 2 respondents (22.22%).

Table 6
Sleep Quality Level Based on Educational Characteristics (n = 16)

Sleep Quality Level	Elementary		Junior		Senior	
	F	%	F	%	F	%
Very good	0	0	0	0	0	0
Good	0	0	0	0	0	0
Not good	0	0	4	67,14	3	42,86
Very bad	3	33,33	2	22,22	4	44,44

From the table it is known that the category of very poor sleep quality was experienced by 3 elementary school respondents (33.33%), experienced by 2 junior high school respondents (22.22%) and experienced by 4 high school respondents (44.44%).

Table 7
Sleep Quality Level Based on CHF Grade (n = 16)

Sleep Quality Level	II		III	
	F	%	F	%
Very good	0	0	0	0
Good	0	0	0	0
Not good	3	42,86	4	57,14
Very bad	2	22,22	7	77,78

From the table it is known that the category of very bad sleep quality was experienced by 2 respondents (22.22%) in grade CHF II and 7 in grade CHF III (77.78%).

Table 8
Sleep Quality Level Based on Dyspnea CHF Category (n = 16)

Sleep Quality Level	Green		Pink	
	F	%	F	%
Very good	0	0	0	0
Good	0	0	0	0
Not good	2	28,57	5	71,43
Very bad	8	88,89	1	11,11

From the table it is known that the category of very poor sleep quality was experienced by respondents with the green dyspnea category as many as 8 respondents (88.89%) and experienced by grade CHF III respondents as much as 1 respondent (11.11%).

DISCUSSION

Dyspnea or shortness of breath often appears in cardiovascular disease (CVD) such as coronary heart disease and Congestive Heart Failure (CHF) or heart failure [10]. Dyspnea in CHF patients can appear as dyspnea on exertion, orthopnoea or paroxysmal nocturnal dyspnoea. Percent of symptoms of shortness of breath, dyspnoea (52%), orthopnoea (81%), paroxysmal nocturnal dyspnoea (76%). Dyspnea will get worse if CHF patients have anemia and pulmonary edema [4], [5].

The mechanism underlying dyspnea is very complex, including the hypothesis that causes dyspnea is a decrease in cardiac output (COP) that occurs during activity in CHF patients which results in respiratory muscle ischemia and ultimately causes respiratory muscle fatigue [6]. Dyspnea disorders in patients with CHF often lead to limited activities of daily living, such as causing sleep problems (Mentz et al., 2015). Sleep disturbance in CHF patients caused by dyspnea is referred to as Sleep-disordered breathing (SDB) [8].

The results showed that the dyspnea score in CHF patients was a mean of 4.2 and a standard deviation of 0.9, and it was known that the most dyspnea category was in the green category with 10 respondents (62.5%). This shows that the CHF patient is still in the mild category of dyspnea. The results showed that the quality of sleep in CHF patients who experienced the most dominant dyspnea was in the very poor category with 9 respondents (56.25%). And of the 9 respondents, it is known that the quality of sleep is very bad experienced by male respondents as many as 7 respondents (77.78%), experienced by 4 high school respondents (44.44%), experienced by respondents in grade CHF III as many as 7 respondents (77.78%) and experienced by respondents in the green dyspnea category were 8 respondents (88.89%).

And of the 9 respondents who experienced dyspnea, the most dominant category is very bad, it is known that the quality of sleep is very bad experienced by male respondents as many as 7 respondents (77.78%), such as research [11] which shows that sleep disorders) is more common in men 49% [11]. This shows that good sleep quality is experienced by female respondents, this is also explained by research [12] which shows that women have better sleep quality than men. This could be possible because men are more accustomed to sleeping late at night or late at night, or it could be possible for men to spend more time at night than women so that women have better sleep quality. As for the level of education, it is known from the results of the study that the quality of sleep is very poor experienced by 44.44% with the education of high school respondents. people with an elementary education background (43%) [13].

The results showed that grade CHF III was more dominant in causing sleep disturbances, and caused a very poor sleep quality of 77.78% compared to grade II which was only 22.22%. This is in line with research [14] which shows that the more severe the condition of

CHF patients, the worse the quality of sleep they experience, and the results of the study also show that the severity of CHF shows the dominant factor that causes poor sleep quality [14]. Changes in sleep quality in CHF patients are also influenced by the severity of the disease which causes pathological changes in patients such as the onset of shortness of breath which will interfere with activities and in sleep conditions, even with the condition that the dyspnea suffered causes CHF patients to wake up more often during sleep at night. CHF patients who are in an unhealthy condition and experiencing disease will definitely experience changes in sleep quality, so that the condition with dyspnea or even pain experienced will affect the quality of their sleep. Obviously, the symptoms of dyspnea will make patients wake up more often at night, so that it will interfere with the rhythm of sleep they experience. In CHF, many experience sleep disturbances and often wake up at night because they feel chest pain and dyspnea. In addition, there are also some individuals who already have sleep disorders due to their illness, and have increased sleep problems as a result of hospitalization. Increasing age will also affect the length and quality of one's sleep [15].

CONCLUSIONS AND SUGGESTIONS

Research had 16 respondents with CHF who experienced dyspnea, it was known that the most dyspnea category was in the green category with a total of 10 respondents (62.5%), the most dominant sleep quality category was the very poor category with 9 respondents (56.25%), sleep quality. Very bad experienced by male respondents as many as 7 respondents (77.78%), experienced by 4 high school respondents (44.44%), experienced by respondents with grade CHF III as many as 7 respondents (77.78%), experienced by respondents with green dyspnea category as many as 8 respondents (88.89%). The research suggestion is to be given intervention to CHF patients who have dyspnea and experience sleep quality disturbances. And further research can be done to improve sleep quality in CHF patients.

REFERENCES

- [1] A. S. Desai, E. F. Lewis, R. Li, and S. D. Solomon, "Rationale and design of the Treatment of Preserved Cardiac Function Heart Failure with an Aldosterone Antagonist Trial : A randomized , controlled study of spironolactone in patients with symptomatic heart failure and preserved ejection fraction," *Am. Heart J.*, vol. 162, no. 6, p. 966–972.e10, 2012.
- [2] World Health Organization (WHO), "Indonesia: WHO statistical profile," *Ctry. Stat. Glob. Heal. Estim.*, 2015.
- [3] Dinas Kesehatan Republik Indonesia, "Riset Kesehatan Dasar 2013," *Ris. Kesehatan Dasar*, pp. 111–116, 2013.
- [4] P. Panel *et al.*, "The 2011 Canadian Cardiovascular Society Heart Failure Management Guidelines Update : Focus on Sleep Apnea , Renal Dysfunction , Mechanical Circulatory Support , and Palliative Care," *CJCA*, vol. 27, no. 3, pp. 319–338, 2011.
- [5] J. A. Ezekowitz, F. A. Mcalister, and P. W. Armstrong, "Anemia is Common in Heart Failura and is Associated With Poor Outcomes," *Circulation*, vol. 107, no. January 6, pp. 223–225, 2003.

- [6] D. M. Mancini, D. Henson, J. Lamanca, and S. Levine, "Respiratory Muscle Function and Dyspnea in Patients With Chronic Congestive Heart Failure," *J. Am. Assoc. Circ.*, vol. 86, no. 3, pp. 909–918, 1992.
- [7] R. J. Mentz *et al.*, "Relation of Dyspnea Severity on Admission for Acute Heart Failure With Outcomes and Costs," *Am. J. Cardiol.*, vol. 115, no. 1, pp. 75–81, 2015.
- [8] K. Ferrier *et al.*, "Sleep-disordered breathing occurs frequently in stable outpatients with congestive heart failure," *Chest*, vol. 128, no. 4, pp. 2116–2122, 2005.
- [9] K. Kasron, "Pengaruh Ventilatory Muscle Training (VMT) Terhadap Penurunan Dyspnea Pada Penderita Congestive Heart Failure," *J. Med. USADA*, vol. 2, no. 1, pp. 31–37, 2019.
- [10] E. Shahar *et al.*, "Sleep-disordered Breathing and Cardiovascular Disease Cross-sectional Results of the Sleep Heart Health Study," *Am. J. Respir. Crit. Care Med.*, vol. 163, pp. 19–25, 2010.
- [11] S. Javaheri, "Sleep disorders in systolic heart failure : A prospective study of 100 male patients . The final report B," *Int. J. Cardiol.*, vol. 106, pp. 21–28, 2006.
- [12] F. Nashori and R. R. D. R. R. Diana, "Perbedaan kualitas tidur dan kualitas mimpi antara mahasiswa laki-laki dan mahasiswa perempuan," *Humanit. (Jurnal Psikol. Indones.)*, vol. 2, no. 2, pp. 77–88, 2012.
- [13] I. N. Sumirta and A. S. Laraswati, "Faktor yang menyebabkan gangguan tidur (insomnia) pada lansia," *Fakt. PENYEBAB RENDAHNYA JUMLAH PRIA MENJADI AKSEPTOR Kel. BERENCANA*, p. 20, 2013.
- [14] I. Suwartika and P. Cahyati, "Analisis Faktor yang Berpengaruh terhadap Kualitas Tidur Pasien Gagal Jantung di RSUD Kota Tasikmalaya," *J. Sk. Keperawatan*, vol. 1, no. 1, p. 130359, 2015.
- [15] S. M. Desiani, "Hubungan Kualitas Tidur Dengan Status Hemodinamik Pada Pasien IMA Di Ruang ICVCU RSUD Dr. Moewardi Tahun 2016," *J. KEPERAWATAN Glob.*, vol. 3, no. 1, pp. 28–33, 2018.