ISSN-0976-0245 (Print) • ISSN-0976-5506 (Electronic)

Volume 13 | Number 2 | April-June 2022

Indian Journal of Public Health Research & Development

An International Journal

Website:
www.ijphrd.com

The Effect of Semi Fowler's Position in Sleep Quality among Heart Failure Patients

Chuchum Sumiarty[1], Nining Fitrianingsih[1], Helza Risdianti[1], Harun Al Rasid[1], Rani Devayanti[1], Rizka Sulistianingsih[2]

[1]Senior Lecturer, Wijaya Husada Health Institute, Bogor, Indonesia, [2]Senior Lecturer, Academy of Midwifery Wijaya Husada, Bogor, Indonesia

Abstract

Background: Coronary heart disease is one of the leading causes of death worldwide. Many cases of coronary heart disease can lead to heart failure. In patients with heart failure, sleep disorders are often found, one of which is paroxysmal nocturnal dyspnea (PND). Paroxysmal nocturnal dyspnea can cause a person to experience shortness of breath while sleeping. This symptom will worsen the condition of heart failure patients because patients will wake up from sleep and experience long-term anxiety and fatigue.

Aim: This study aims to determinethe effect of Semi Fowler's Position in sleep quality among heart failure patients.

Methodology: The design of this study waspre-experimental which involved one group pre-test and post-test design approach, using Pittsburgh Sleep Quality Index (PSQI) instrument. The study was conducted at Indonesian Red Cross Hospital in Bogor City with a total sample of 32 heart failure patients. The data analysis techniques used wereunivariate and bivariate with Sample Paired T-Test.

Result: Out of 32 participants, 32 participants(100%) had bad sleep quality before intervention with Semi Fowler's Position and 29 participants (90.6%) had good sleep qualityafter practicing Semi Fowler's Position.

Conclusion: There was a significant effect of Semi-Fowler's Position in sleep quality among heart failure patients.

Keywords: *Heart Failure, Paroxysmal Nocturnal Dyspnea, Semi-Fowler's Position, Sleep Quality*

Introduction

The largest contributor to cardiovascular disease deaths is coronary heart diseaseand approximately two-thirds of patients with coronary heart disease develop heart failure(1).

Heart failure is a major public health problem worldwide. Heart failure is the final stage of heart disease after the myocardium has used up all its reserves and compensatory mechanisms(2).

Corresponding Author:
Nining Fitrianingsih,
MHSc School of Nursing, Wijaya Husada Health Institute Jl. Letjen Ibrahim Adjie No. 180, Bogor, West Java, Indonesia
Email: wijayahusada@gmail.com

World Health Organization (WHO) recorded 17.5 million people in the world died from cardiovascular disorders. The number of heart disease cases in the United States was 136 per 100,000 people in 2016. The number of heart disease cases in Asia such as in China was found as many as 300 per 100,000 people, while in Indonesia 371 per 100,000 people and this made Indonesia included in the group with the highest number of cases[3].

Based on Basic Health Research Data(2017), the prevalence of heart failure cases in Indonesia was 0.13% or an estimated 229,696 people. Based on the diagnosis and symptoms, the highest estimated number of patients with heart failure was in West Java Province with a total of 96,487 people (0.3%). Meanwhile, based on health data from Bogor Regency in 2017, number of patients with heart failure was 1,427 people (2.59%) [4].

Heart failure causes various clinical symptoms including dyspnea, orthopnea, and the most frequently encountered symptom is Paroxysmal Nocturnal Dyspnea (PND) or shortness of breath at night, which appears suddenly and causes the patient to wake up[5]. The emergence of various clinical symptoms in patients with heart failure will cause nursing problems and interfere with basic human needs, one of which is sleep disorders[6].

Nurses as health care providers could facilitate patients to solve problemsthrough independent and collaborative actions [7]. Nurses can help to identify symptoms that appear in patients with dyspnea or changes in breathing patterns and givepreliminary interventions byproviding oxygen and practice Semi-Fowler'sPosition[8]. According to Javaheri (2016), the Semi-Fowler'sPosition will affect the state of cardiac output and development of the patient's lung cavity, so that shortness of breath is reduced and optimize the patient's sleep quality. The development of the chest cavity and lungs will cause oxygen intake to improve and the respiration process will return to normal[9].

Adjusting the patient intoSemi-Fowler'sPosition at an angle of 45 degrees will help reduce oxygen consumption and increase maximal lung expansion as well as overcome impaired gas exchange associated with changes in alveolar membranes and produce good quality sleep[10]. Shahab S, Fvuzan S, and Budiharto I. (2016) revealed that the SemiFowler's Position with an angle of 45 degrees resulted in better sleep quality for patients with heart problems[11].

Methodology

Based on the preliminary study that has been conducted at Indonesian Red Cross Hospital in Bogor City through patients' medical record data, there were94 patients diagnosed with heart failurefrom January to December 2020. It has recently been reported that out of 8 patients diagnosed with heart failure, 6patients experienced sleep disorderand 3 patients had uncomfortable sleeping position.

This type of research usedpre-experimental design, with one group pre-test and post-test design. The population in this study were patients with heart failure with a sample of 32 participants.

The study inclusion criteria were heart failure patients, in consciousstate, and cooperative. Meanwhile,the exclusion criteria were patients who had decreasedconsciousness or unwilling to be a participant. Thesampling technique used was Quota Sampling (Judgment Sampling)[12]. After the number of samples was identified, then stepswere taken for the first participant who was given code1 and followed by other participantsuntil it reachedcode 32.

Researchers submitted a research permit issued by Wijaya Husada Health Institute Bogor to the head of the Indonesian Red Cross Education and Training Hospital. The Head of the Education and Training Division of Indonesian Red Cross Hospital in Bogor

City gave permission to researchers for conducting this study. After obtaining research permit, researchers met the head of the Intensive Care Unit to ask for permission and explained the instruments to be used for the research. Types of data collected in this study were primary data through observation and questionnaires, and secondary data through medical records to determine the number of heart failure population.

The questionnaire contained personal identification and the Pittsburgh Sleep Quality Index (PSQI) questionnaire. The nominal dispatch scales for sleep quality is categorized as follows:

1. Good sleep quality (total score 0-5)
2. Bad sleep quality (total score 6-21)

The magnitude of the effect is determined by Sample Paired T-Test.

Results

This research was conducted in April 4-20, 2021. The participants aged more than 40 years oldwas 29 participants (90.62%), while 25 participants (78.12%) were female and 28 participants (87.5%) had high school level education.

Table 1: Normality Test of Sleep Quality Among Heart Failure Patients

Group	Shapiro-Wilk		
	Statistic	df	Sig.
Pre-Test	0.925	32	0.150
Post-Test	0.947	32	0.125

Based on Table 1, the data were normally distributed and the *p-value* in the pre-test and post-test groups was significant (>0.05).

Table 2: Homogeneity Test of Sleep Quality Among Heart Failure Patients

	Levene Statistic	Sig.
Based on Mean	1.416	0,164
Based on Median	1.286	0.187
Based on Median and with adjusted df	1.239	0.165
Based on trimmed mean	1.235	0.182

Based on Table 2, it can be seen that that the data is homogeneous (0,164>0.05).

Table 3: Frequency Distribution of Sleep Quality Among Heart Failure Patients Before Intervention with Semi Fowler's Position

Sleep Quality	Total	Percentage (%)
Bad	32	100
Good	0	0
Total	32	100

Based on Table 3, most of the participants experienced bad sleep quality with a total of 32 participants (100%).

Table 4: Frequency Distribution of Sleep Quality Among Heart Failure Patients After Intervention with Semi Fowler's Position

Sleep Quality	Total	Percentage (%)
Bad	3	9.34
Good	29	90.6
Total	32	100

It can be seen from table 4 that most of the participants experienced good sleep quality with a total of 29 participants (90.6%).

Table 5: Effect of Semi Fowler's Position in Sleep Quality Among Heart Failure Patients

Paired Differences					
	Mean	**T**	**Df**	**Correlation**	**Sig. (2-tailed)**
Pre-test – Post-test	6.7333	18.802	31	0.3581	0.000

Table 5 shows thatthep-value = 0.000, whichmeansp-value<0.05and Hawas accepted. This hypothesisshows that thereis a significant realationshipbetweenSemi Fowler's Position and sleep quality among heart failure patients.

Discussion

A. Sleep quality of heart failure patients before intervention with Semi Fowler's Position

Based on the frequency distribution of the sleep quality in heart failure patients before intervention withSemi Fowler's Position, the majority of

participants had bad sleep qualitywith a total of 32 participants (100%).

This study is in line with research conducted by PuspitaDewi (2017) which states that around 68% of heart failure patients have problems with bad sleep quality[13].

The short-term effects of impaired sleep quality are increased response to stress, somatic pain, decreased quality of life, emotional distress, mood disturbances, cognitive impairment, and memory[14]. While the long-term effects that arise are hypertension, dyslipidemia, heart disease, weight problems, metabolic syndrome, type 2 diabetes, and colorectal cancer [15].

A person who experiences sleep disorders often shows an inadequate response to external stimuli and difficulty concentrating, due to limitations in the quality and quantity of sleep, thus interfering with their ability to carry out activities[16].

B. Sleep quality of heart failure patientsafter intervention with Semi Fowler's Position

Based on the frequency distribution of the sleep quality in heart failure patients after intervention with Semi Fowler's Position, the majority of participants had good sleep qualitywith a total of 29participants (90.6%).

This study is in line with research conducted by Iyonu's (2014) which stated that the provision of a 45-degree Semi Fowler's Position had a significant effect in improving the sleep quality of heart failure patients[17].

Position is an important component in critical care to optimize ventilation status and increase the effectiveness of gas exchange in the lungs. The Semi Fowler's Position of 45 degrees has an effect on oxygenation and blood gas parameters with oxygen saturation, partial pressure of oxygen and a decrease in carbon dioxide pressure, also increases tidal volume by means of the diaphragm and alveolar expansion[18]. Thus, the Semi Fowler's Position will reduce shortness of breath in heart failure patients and improve sleep quality[18].

C. The effect of Semi Fowler's Position in sleep quality amongheart failure patients

Based on Table 5, *p-value*=0.000, which indicated that there was a significant effect of Semi Fowler's Position in sleep quality of heart failure patients at Indonesian Red Cross Hospital inBogor City.

This study is in line with research conducted byWijayati S, Ningrum DH, and Putrono P (2019) which stated that a change in Semi Fowler's Position has a significant effect in the sleep quality of heart failure patients [10].

This fact is also supported by research conducted Javaheri S, Blackwell T, Ancoli-Israel S, Ensrud KE, Stone KL, Redline S (2016) which described that 45-degree Semi Fowler'sPosition will affect the state of cardiac output and the development of the patient's lung cavity, hence shortness of breath will be reduced and sleep quality of heart failure patients will be improved [9].

Conclusion

There was a significant effectof Semi Fowler's Positionin sleep quality among heart failure patients atIndonesianRed Cross Hospital in Bogor City, West Java, Indonesia.

Ethical Clearance: Ethical clearance was not required hence was not obtained.

Source of Funding: Self-funded.

Conflict of Interest: There was no conflict of interest in the research.

References

1. Corrigendum: 2016 ESC Guidelines for the

diagnosis and treatment of acute and chronic heart failure (European Heart Journal (2016) 37:27 (2129-2200) DOI: 10.1093/eurheartj/ehw128). European Heart Journal. 2018.

2. Siswanto BB, Hersunarti N, Erwinanto, Barack R, Pratikto RS, Nauli SE, et al. Pedoman Tatalaksana Gagal Jantung Perhimpunan Dokter Spesialis Kardiovaskular Indonesia 2015. Indones Hear Assoc Perhimpun Dr Spes Kardiovask Indones. 2015;
3. WHO. Fact Sheet: cardiovascular disease. Cardiovasc Dis. 2017;
4. Kemenkes RI. Data Informasi Kesehatan Indonesia 2018. Profil Kesehat Indones. 2018;53(9).
5. Chuchum Sumiarty C. The Relationship On The Level Knowledge Of Nurses Among Patient Safety Implementation In Emergency Room And Intensive Room At Leuwiliang Hospital Bogor. J Ilm Wijaya. 2018;
6. Inamdar A, Inamdar A. Heart Failure: Diagnosis, Management and Utilization. J Clin Med. 2016;
7. The Correlation between Pandemic Covid-19 Stress Level and Frequency of Relapse in Coronary Heart Disease Patients. Indian J Public Heal Res Dev. 2021;
8. Mubarak WI, Indrawati L, Susanto J. Buku Ajar Ilmu Keperawatan Dasar. Buku 1. 2015.
9. Javaheri S, Blackwell T, Ancoli-Israel S, Ensrud KE, Stone KL, Redline S. Sleep-disordered breathing and incident heart failure in older men. Am J Respir Crit Care Med. 2016;
10. Wijayati S, Ningrum DH, Putrono P. Pengaruh Posisi Tidur Semi Fowler 450 Terhadap Kenaikan Nilai Saturasi Oksigen Pada Pasien Gagal Jantung Kongestif Di RSUD Loekmono Hadi Kudus. Medica Hosp J Clin Med. 2019;
11. Shahab S, Fvuzan S, Budiharto I. The Influence of Semi Fowler 45 ˚ Sleep Position to Sleep Quality Of Heart Failure Patients in ICCU dr. Soedarso Hospital Pontianak. J Univ Tanjungpura. 2016;
12. Sugiyono. Metode Penelitian Kuantitatif, Kualitatif dan R&D. Bandung: PT Alfabeta; 2016.
13. Puspita Dewi I. Kualitas Tidur Pasien Gagal Jantung Dan Penanganannya. J Keperawatan Komprehensif. 2017;
14. Rahayu LP, . S, Sudrajat DA, Nurdina G, Agustina EN, Antika PT. The Risk Factor of Recurrence Stroke Among Stroke and Transient Ischemic Attack Patients in Indonesia. KnE Life Sci. 2019;
15. Basoglu OK, Keskin B, Tasbakan MS, Gurgun C. Effect of semirecumbent sleep position on severity of obstructive sleep apnea in patients with heart failure. Vol. 21, Journal of Cardiac Failure. 2015. p. 842–7.
16. Radityo WE. Depresi dan Gangguan Tidur. Fak Kedokt Univ Udayana. 2020;
17. Iyonu R. Hubungan Posisi Tidur Semi Fowler dengan Kualitas Tidur Pada Klien Gagal Jantung Kongestif di RSUD MM Dunda Limboto. Skripsi. 2014;
18. Widia Astuti AW W, Fajar Adhie Sulistyo F. The Relationship Of Suction Action Intensity Through The Changing Of Oxygen Saturation In Patients Installed Ventilator At Intesive Room, RSUD Kota Bogor. J Ilm Wijaya. 2020;