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Nursing Care For Patients with Congestive Heart Failure (Chf) By Giving 45º Head Up Position to Overcome The Problem Of Ineffective Breathing Patterns at RSUD General Ahmad Yani Metro City

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ABSTRACT

Background & Objective: This study is to determine the nursing care of Congestive Heart Failure (CHF) patients with nursing problems of ineffective breathing patterns with nursing interventions for head up 45o at Jenderal Ahmad Yani Metro Hospital. **Method:** Data collection using surgical nursing care assessment sheets and oxygen saturation observation sheets. The study used Congestive Heart Failure (CHF) patients. **Result:** The results of nursing care obtained the results of evaluations that researchers conducted on clients based on the criteria that researchers compiled against 3 diagnoses, the resolved diagnoses were ineffective breathing patterns, decreased cardiac output and activity intolerance. Diagnoses of ineffective breathing patterns experienced an increase in oxygen saturation which was initially 89% after being given a 45o head up position to 99%. **Conclusion:** Suggestions for patients and families can apply the 45o head up position when experiencing shortness of breath at home and remain compliant with taking medication.

Introduction

Congestive Heart Failure (CHF) is a condition where the function of the heart as a pump to deliver oxygen-rich blood to the body is not sufficient to meet the needs of the body, heart failure is the inability of the heart to pump blood in sufficient quantities to meet tissue needs for oxygen and nutrients, heart failure is a pathophysiological condition where the heart as a pump is unable to meet the needs of blood for tissue metabolism. (Virani et al., 2021). Heart failure causes several clinical symptoms, the most common of which is dyspnea felt at night, which often occurs suddenly and causes the patient to be awake. Heart failure is a clinical syndrome characterized by shortness of breath at rest or with activity and physical weakness

caused by an abnormal condition in the structure or function of the heart (Zendrato, 2020).

According to (WHO, 2020) heart disease is a worldwide disease as the leading cause of death worldwide over the past 20 years that based on WHO data in (2020) the number of cases of congestive heart failure in the world reached 64.34 million cases with a total mortality rate of 9.91 deaths. 346.17 billion US dollars are estimated to be spent on the cost of treating patients with congestive heart failure. (Benjamin et al., 2021) Meanwhile, on the ASIAN continent, the highest incidence of CHF is in the country of India with 8 million cases (19.5%), and the next Asian country is China with 7.5 million people (18.9%) (Dewanta et al., 2021).

Data from the Basic Health Research in 2022 showed that the prevalence of heart failure in Indonesia based on a doctor's diagnosis was estimated at 1.5% or an estimated 29,550 people, with the highest incidence rate in North Kalimantan Province at 2.2% and the lowest in NTT Province at 0.7% (Badan Penelitian dan Penelitian Kesehatan, 2023). The highest prevalence of CHF is at the age of 65 - 74 years (0.5%) with a mortality rate of 45% - 50% (Aune et.al, 2023). The number of CHF cases in Lampung Province was 1,611 patients, most of which occurred in Bandar Lampung City with 641 patients and in Metro City with 387 CHF patients (Lampung Health Office, 2022).

A person's risk factor for heart disease is determined through the interaction of two risk factors, namely factors that cannot be controlled (nonmodifiable risk factors) such as heredity, age, gender, and factors that can be controlled (modifiable risk factors) namely Dyslipidaemia, high blood pressure (hypertension), smoking, Diabates Mellitus disease, stress, and obesity (Agus, 2020).

The impact that often occurs in CHF patients is chest pain and shortness of breath which is characterized by a decrease in SPO2. Chest pain in CHF patients is often caused by a decrease in oxygen supply to the myocardium which causes heart cell death, while shortness of breath experienced by CHF patients is caused by abnormalities in heart structure and function which results in damage to ventricular function to meet the needs of nutrients and oxygen to body tissues (Lalu, 2021). Disruption of oxygenation needs is an important problem in CHF patients. In line with research (Rayanu & Nur, 2020), it shows that all CHF patients in their study experienced hypoxia with details of 1 person (3.1%), 18 people (54.5%) experienced moderate hypoxia, and 14 people (42.4%) experienced severe hypoxia.

One of the interventions that can be done to overcome the decline in oxygen saturation is the provision of oxygen therapy, physical therapy, occupational therapy, respiratory therapy, nutritional therapy and the provision of semi-fowler position. Giving oxygen together with giving the semi fowler position will accelerate the increase in oxygen saturation compared to patients who are only given oxygen without being given the semi fowler position, supported by the results of research (Hendrawan, 2019) showing that oxygen saturation of CHF patients before the 45^0 position intervention was 89.83% (standard deviation 1.487) with the lowest oxygen saturation value of 88% and the highest of 93%, this indicates that giving the semi fowler position can increase oxygen saturation. The semi fowler position is a 45^o position at the head of the bed area. The purpose of the semi fowler position is to help overcome respiratory and cardiovascular difficulties, the semifowler position intervention will be given for 15 minutes and carried out at the same hour to

determine the difference in oxygen saturation and respiration rate before and after being given the semifowler position (Aisyah, 2020).

The 45^{o} head up position uses gravity to help breathing, so that oxygen entering the lungs will be more optimal so that patients can breathe more freely and will reduce the discomfort felt when wanting to sleep. This is in line with research conducted (Arif et al., 2021) on the Effectiveness of the Semi Fowler Position on Decreasing Respiration Rate (RR) for Congestive Heart Faillure (CHF) Patients in the Lily Room of Sunan Kalijaga Demak Hospital, the results showed that there was an effect of the semi fowler position effectively reducing Respiration Rate (RR) in Congestive Heart Faillure (CHF) patients in the Lily Room of Sunan Kalijaga Demak Hospital, In line with Khasanah's research (2023) that Respiration Rate (RR) tends to decrease and from semi fowler position to fowler Respiration Rate (RR) tends to remain (although it increases, but the increase is very small). Based on the Friedman test, it was found that there was a difference in respiration rate (RR) before, after being given the 450 position in CHF patients in the emergency room.

The number of patients with heart failure at Ahmad Yani Hospital from January to December 2023 was 145 patients (8.64%). The data that the author describes for the incidence of heart failure at Jendral Ahmad Yani Metro Hospital based on the most common disease in the heart room is CHF. Based on data from the medical record of General Ahmad Yani Metro Hospital as shown in the table above, it can be seen that the incidence of heart failure in 2023 from January - December there were 145 patients (8.64%), and the impact of problems that occur in patients with heart failure. The results of the presurvey conducted by the author in the heart room of the General Ahmad Yani Metro Hospital for 3 respondents, obtained the results of observations of 3 CHF patients who were given NRM (Non Rebriting Mask) oxygen with a concentration of 10 Liters / minute and a bed rest position obtained the results that 2 patients experienced an increase in oxygen saturation faster and while 1 patient was still with the same oxygen saturation. Based on the description and phenomena that exist, the researcher is interested in conducting research on "Nursing care for Congestive Heart Failure (CHF) patients with ineffective breathing patterns with nursing interventions for giving head up 45^{o} at Jenderal Ahmad Yani Metro Hospital".

Objective

The purpose of this study was to describe comprehensive nursing care including bio-psycho-socio-spiritual aspects in patients with the Cardiovascular System: Congestive Heart Failure with a nursing process approach.

Method

Data collection methods using surgical nursing care assessment sheets and oxygen saturation observation sheets. The study used Congestive Heart Failure (CHF) patients.

Results

Analysis of Patient Characteristics

At the time of the assessment, it was found that the patient's name was Mrs. N, the patient's age was 63 years old, the patient's occupation was a farmer and the patient's last education was junior high school. According to Vani (2021), women suffer more from Congestive Heart Failure (CHF) this is because most women

generally experience menopause, at which time LDL cholesterol increases which causes women to suffer more from Congestive Heart Failure (CHF).

This is in accordance with the research of Harigustian et al, (2023) with the title description of characteristics in Congestive Heart Failure (CHF) patients, it was found that patients with Congestive Heart Failure (CHF), in women (53.12%) and in men (46.88%). Based on the results of data and research, the researcher concluded that the gender of men and women has an effect on the diseases suffered and the lifestyle they live.

From the results of the analysis obtained the last education of Congestive Heart Failure (CHF) patients, namely junior high school. A person's level of education is related to a person's ability to receive health information which is then used as knowledge and becomes the basis for their health care. This agrees with the research of Harigustian et al, (2016) which states that the better a person's level of education, the better the awareness of personal and family health so that the possibility of getting sick will be less frequent. This is in accordance with Maulida's research (2018) with the title description of the characteristics of Congestive Heart Failure (CHF) patients, it was found that 26 people (86.7%) had high education.

Based on the results of data and research, the researcher concluded that patients who have higher education experience Congestive Heart Failure (CHF), because they are unable to control their lifestyle even though they know more or less about preventing the disease they suffer.

From the results of the analysis obtained the occupation of Congestive Heart Failure (CHF) patients, namely farmers. This agrees with Rochmi (2020) that labor work is heavy work that can be a burden and cause health problems, especially in the cardiovascular system. Based on the data on demographic characteristics, the highest result obtained that can affect Congestive Heart Failure (CHF) patients in implementing the treatment program is at the level of employment, because clients who undergo treatment and take medication on average work due to economic conditions and living needs. In accordance with Maulida's research (2018) with the title description of the characteristics of Congestive Heart Failure (CHF) patients, it was found that respondents worked as many as 18 people (60%).

Analysis of Major Nursing Problems

In this study, the main problem found in patients is ineffective breathing patterns associated with respiratory muscle weakness as evidenced by subjective data: The client said it was difficult to breathe, lien said shortness of breath after walking 6 steps. Objective data: The client appeared short of breath, the client appeared to have difficulty breathing, cold extremities, respiration 28 x/min, the client was attached to O2 5 LPM, besides that the client also had a history of hypertension.

According to (Arif, 2021), it is explained that one of the causes of clients suffering from CHF disease is hypertension. Hypertension can cause heart failure through several mechanisms, including left ventricular hypertrophy. Left ventricular hypertension is associated with systolic and diastolic left ventricular dysfunction and increases the risk of myocardial infarction, as well as making it easier for arrhythmias to occur, both atrial arrhythmias and ventricular arrhythmias. With this patient suffering from Congestive Heart Failure (CHF) in the classification of left heart failure.

In the theoretical review of patients with Congestive Heart Failure (CHF) theoretically clinical manifestations that can be found are dizziness, tightness during

activity and at rest, fatigue, edema, palpitations and oliguria Agus (2023). Palpitations that occur along with other symptoms (shortness of breath, pain, fatigue, or fainting) may be the result of abnormal heart rhythms or serious heart disease. Shortness of breath during activity or at rest, fatigue and palpitations are the main symptoms in CHF patients where there is impaired ventricular filling (atrioventricular valve stenosis), as well as impaired ventricular filling and ejection (constructive pericarditis and cardiac temponade). Left ventricular failure leads to pulmonary congestion and impaired respiratory control mechanisms. These problems will eventually lead to respiratory distress. When the increase in heart load and extreme work of breathing will increase the metabolic needs of the body (Devi et al., 2021).

According to (Devi et al, 2021) Diagnostic results help determine the underlying cause and degree of heart failure. Laboratory tests are needed to determine the extent to which heart failure has impaired the function of other organs, such as the liver, kidneys, and others. Electrolytes such as sodium, potassium and chloride are elements or chemicals that the body and heart need to work properly. These electrolytes can change due to fluid transfer and decreased kidney function associated with heart failure and medications such as diuretics used in heart failure therapy. Electrocardiography is used to identify ECG changes associated with ventricular enlargement or strain and detect dysrhythmias, myocardial ischemia or infarction. It may also show atrial enlargement, tachycardia, extrasystole, or atrial fibrillation. A thorax photograph is performed to evaluate organs and structures within the chest. It usually shows increased pulmonary vascular markings, interstitial edema, or pleural effusion and cardiomegaly.

The supporting factors that the author found in conducting the assessment were the availability of adequate physical examination tools, the existence of a complete patient status that made it easier for the author to collect data, the establishment of work there between room nurses, as well as other health teams such as doctors, pharmacists, laboratory staff, and a team of nutritionists. In addition, the availability of a complete and systematic assessment format, so that the data collected can be categorized properly. At the assessment stage, the author did not find significant obstacles because the patient and family were quite cooperative.

Based on the results of the assessment at the nursing diagnosis stage that emerged was not much different from those in the theoretical review, there were only a few diagnoses added from the case that occurred. The author only formulates diagnoses according to the patient's complaints and conditions based on the assessment that has been done.

Nursing Action Analysis Based on Nursing Diagnoses

In the results of this nursing care, the researcher focuses on the nursing diagnosis of ineffective breathing patterns where the author, provides additional interventions in the form of a 45^{o} head up position, but the author also continues to provide interventions in accordance with Indonesian nursing intervention standards (SIKI, 2019).

After the nursing diagnosis appears, the author prioritizes the problem. Prioritization of problems refers to the “Maslow” hierarchy as well as those that threaten the patient's life. Then make nursing interventions or planning, is a process in problem solving which is an initial decision about something what to do, how to do, when to do, who does all nursing actions (Dermawan, 2022). This plan is the main

means of communication, and maintains continuity of client nursing care for all team members. In accordance with this statement, it is known that in making plans, it is necessary to consider the objectives, criteria for the results that are expected or expected in nursing interventions (Setiadi, 2021).

Guidelines for writing outcome criteria based on SMART (Specific, Measurable, Achieveble, Reasonable and Time). Specific is client-focused. Measurable is measurable, visible, palpable, felt and smelled. Achieveble is a goal that must be achieved. Reasonable is a goal that must be scientifically justified. Time is the limit of achievement within a certain time frame, the time limit must be clear (Dermawan, 2022).

One of the efforts that can be made to increase oxygen saturation is by giving a comfortable position. One of the comfortable positions given to patients is the 45^{o} head up position. Setting the head up 45^{o} position is very effective in cardiopulmonary diseases. This method can reduce pulmonary secretions and reduce the risk of chest wall subsidence. Research conducted by Khasanah (2019) shows that the average oxygen saturation (SaO2), from a 45^{o} head up position has increased by 0.5 points and from a 45^{o} head up position has also increased by 0.2 points. The results of the study in line with Fera et al (2017) with this study showed that after being given the 30^{o} position the average oxygen saturation of CHF patients changed to 96.10% (standard deviation ± 2.354) with the lowest oxygen saturation value of 88% and the highest of 99%. After being given the 45^{o} position, the average oxygen saturation of CHF patients is 99.90% (standard deviation ± 0.305) with the lowest oxygen saturation value of 99% and the highest of 100%. Meanwhile, after being given the 60^{o} position intervention, the average oxygen saturation of CHF patients also changed to 97.63% (standard deviation ± 1.586) with the lowest oxygen saturation of 95% and the highest of 100%. The results also showed that giving head up 45^{o} was the most effective on oxygen saturation in CHF patients in the Emergency Department.

Setting the sleeping position by raising the back of the shoulders and head 45^{o} allows the chest cavity to expand widely and lung development increases. This condition will cause oxygen intake to improve so that the respiration process returns to normal. This is as conveyed by Cheever & Hinkle, (2024) which states that fowler and semi-fowler sleeping position settings can improve lung and pulse development conditions. As the results of Anchala's research (2022) which shows that there is a significant difference in SaO2 in the semi fowler position compared to other positions in patients admitted to the ICU.

The results of this study are in line with the research findings of Muhsinin and Kusumawardani (2019) that there is an effect of applying 45^{o} head up positioning on changes in respiratory rate in pneumonia at Mataram City Hospital. According to Supandi, et.al (2023) that the 45^{o} head up position where the head position is raised 45° makes oxygen in the lungs increase so as to alleviate breathing difficulties. The decrease in shortness of breath is also supported by the patient's cooperative attitude, obedient when given a position so that the patient can breathe. These results are also in line with research conducted by Burhan et.al (2023) using the semi fowler position can be effective for reducing shortness of breath in patients with pulmonary tuberculosis.

Patients positioned head up 45o will increase blood flow in the brain and maximize oxygenation of cerebral tissue. This is in line with research conducted by

Wijayati, Ningrum and Putrono (2019) showing that there is an effect of giving head up 45o to increase oxygen saturation in patients with congestive heart failure.

The supporting factors that the authors found were the many sources obtained through literature studies as reference material, so that the authors did not find significant obstacles in compiling nursing interventions. The inhibiting factor is the number of sources that contain the same intervention even with different diagnoses. The alternative problem solver is that the author adjusts according to the complaints and needs of the patient.

Analysis of Nursing Actions According to Research Results

Analysis of the actions taken by the author is to focus on providing a 45o head up position on the diagnosis of ineffective breathing patterns and decreased cardiac output. In the 3 diagnoses found in patients, nursing problems can be resolved on day three, where the patient no longer feels shortness of breath, and the heart is no longer pounding, and no longer feels tired during activities.

Positioning is an action taken intentionally to provide body positioning to improve physical and psychological well-being or comfort. Nursing interventions carried out for patients with heart failure include placing a therapeutic bed, encouraging patients to include changes in position, place in a therapeutic position, position the patient in a body aligment condition, position the patient to reduce dypsneu such as a semifowler position, elevate 20o or more above the heart to improve blood flow (Hass, 2015). Sleeping position (positioning) in heart failure patients is very important to maintain bed rest to overcome shortness of breath at rest (Yesni, 2019). The position that can be given is the semifowler position. The semifowler position is an elevated sleeping position of 30o - 45o. Giving semifowler position can reduce oxygen consumption and increase maximum lung expansion, and overcome gas exchange damage related to gas exchange related to changes in the capillary membrane of the alveolus (Iyonu, Zees & Kasim, 2014).

Positioning is one of the nursing actions that can help minimize circulatory dams. As stated by Cicolini et al (2010) that positioning has an effect on changes in blood pressure and central venous pressure. Different positions affect hemodynamics including the venous system. Some previous research results such as research by Resti, Sadiyanto and Khasanah (2017), on CHF patients admitted to the ICCU, found that there were differences between respiratory rate, oxygen saturation and complaints of shortness of breath in the initial position with fowler 450 and fowler 900, but the fowler 900 position was more favorable in improving respiratory status in patients with heart failure. Smeltzer and Bare (2014) state that adjusting the sleeping position by raising the back of the shoulders and head around 30 ° or 450 allows the chest cavity to expand widely and lung development increases. This condition will cause oxygen intake to improve so that the respiration process returns to normal. This result is in line with research by Kubota, Endo and Kubota (2013) which shows that slight flexion of the upper body in the fowler position will activate respiratory function and increase the contribution of vagal nerve activity to the cardiovascular system. Decreased blood flow back to the heart causes the heart's workload to decrease. The decrease in heart workload has an impact on reducing pressure in the ventricle and left atrium, so that it will cause a decrease in pressure in the pulmonary capillaries so as to reduce pulmonary udema.

Supported by research (Rayanu & Nur, 2020) Based on the results of the analysis using the Wilcoxon test, the significance value of sleep quality obtained p value 0.001 < α = 0.05 and the significance of oxygen saturation p value 0.000 < α = 0.05, so Ha is accepted, which means that giving a 45o head up position is effective on sleep quality and oxygen saturation in Congestive Hearth Failure patients. Giving 45o head up position is effective on sleep quality and oxygen saturation of Congestive heart failure patients at Batang Hospital. In the third article, it was found that based on the analysis of the paired t test, the average value of respiratory rate before changing the head up 45o position was -3.309, while after changing the head up 45o position with a mean value of 6.231. In addition, from the results of the mann withney test obtained a sig value of p = 0.000.

Also supported by research (Lalu, 2021) Based on the analysis of the paired t test, the average value of respiration rate before changing the head up position 45o - 2.769, while after changing the head up position 45o with a mean value of 5.827.

From the entire nursing implementation carried out and its implementation in accordance with the nursing action plan that the author has made. However, there is one action that is not taken, namely collaboration with a doctor in giving laxatives if it is not resolved with fiber foods. In this action, the patient is not carried out because it can still be overcome with foods that are high in fiber. For the implementation of education, the author involves the family because the family is a support system in reminding patients at home. In patients with heart failure, symptoms of recurrent attacks can occur, so education is always carried out to minimize or prevent recurrent attacks. Education can be provided in various ways, namely by direct discussion education from the nurse and can be done by giving leaflets. In the implementation of activities, factors that support and hinder in implementing the actions to be taken. Supporting factors such as patients and families can cooperate with nurses in overcoming the problems faced, so that nurses can intervene properly. As well as the availability of medical devices that make it easier to carry out nursing actions. While the inhibiting factor is the diagnosis of activity intolerance, the patient does not cooperate or obey in the implementation of nursing because the patient often gets out of bed to fulfill daily needs (toileting) so that the patient's intervention does not go well.

Conclusion

Assessment

The assessment found in the patient complained of shortness of breath, the patient had hypertension, the patient also said that when walking 6 steps he felt shortness of breath, the shortness recurred if the client rested completely, the client said he quickly experienced fatigue, besides that the client also said he could not do activities, if doing activities the body felt weak and energetic, the client also said the chest felt pounding sometimes painful, the shortness felt by the patient increased when the patient did the activity.

Nursing Diagnosis

As stated by several experts previously, the list of nursing diagnoses in chapter two found similarities with real cases obtained in clients with CHF. The similarities are ineffective breathing patterns and decreased cardiac output, but there is 1 difference in nursing diagnoses that arise, namely activity intolerance.

Nursing Intervention

The planning used in the case of the client is adjusted to the nursing problem that is established based on the criteria for major, minor signs and symptoms and the client's current condition with the addition of the intervention of providing a 45o head up position on the nursing diagnosis of ineffective breathing patterns for 3 days of care.

Nursing Implementation

Nursing implementation is adjusted to the action plan that the researcher has compiled. Nursing implementation carried out on clients in accordance with planned interventions based on existing theories and in accordance with the needs of clients experiencing ineffective breathing patterns, namely by applying the action of providing a 45o head up position.

Nursing Evaluation

The end of the nursing process is an evaluation of the nursing care provided. In the evaluation that researchers do on clients based on the criteria that researchers compile for 3 diagnoses. The resolved diagnoses are ineffective breathing patterns, decreased cardiac output and activity intolerance.

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References

1. Agus. (2020). Increasing Blood Pressure Medications at Hospital Discharge May Pose Serious Risk 30-Day Outcome of Patients Who Received Intensified Antihypertensives and Those Who Did Not. 1–8.
2. Aisyah, P. I. (2020) Sistem Kardiovaskular At a Glance, (diterjemahkan oleh: Juwalita Surapsari), 3 ed, PenerbitErlangga, Jakarta.
3. AHA. (2021). 2021 Heart Disease & Stroke Statistical Update Fact Sheet Global Burden of Disease. https://doi.org/10.1161/CIR.0000000000000950
4. Arif Ganda Nugroho, Adia Lobi, Emelia Mei Syarah, Fithria Ilma, Laila Eka Pratiwi S.N., Rahmaniah, R. W. (2021). Analisa Nilai Tanda-Tanda Vital Pasien Gagal Jantung. Health Care : Jurnal Kesehatan, 7(2), 62–68. https://doi.org/10.36763/healthcare.v7i2.26
5. Benjamin EJ, Blaha MJ, Chiuve SE, et al.Heart Disease and Stroke Statistics. 2021 Update: A Report from the American Heart Association. Circulation. 2021;135(10):146- 603.
6. Budhiparama, N. C. (2020). Pendidikan Interprofesional Gangguan Sisten Kardiovaskuler (Nicolas DKK (ed.)). Airlangga University Press.
7. Cendradevi, & Febtian. (2021). Peningkatan Saturasi Oksigen Pada Pasien CHF melalui Pemberian Posisi Head Up. Ners Muda, Vol 1 No 2, Agustus 2020. E-ISSN: 2723-8067.
8. Devi dkk. (2021). Efektifitas Pemberian Posisi Head Up 30 Derajat Terhadap Peningkatan Saturasi Oksigen Pada Pasien CHF di IGD Rumah Sakit Pusat Jantung Nasional. Universitas Muhammadiyah. Jakarta
9. Dewan et.al. (2019). Sex-related differences in heart failure with preserved ejection fraction. Circulation: Heart Failure, 12, e006539.

10. Didit & Nety. (2017). The Effect Of Head Positioning On Cerebral Hemodynamics: Experiences In Mild CHF. Journal of the Neurological Sciences, 419(September), 117201. https://doi.org/10.1016/j.jns.2020.117201
11. dwi kartika rifianty, I. (2020). Posisi Head Up 300 Sebagai Upaya untuk Meningkatkan Saturasi Oksigen Pada Pasien CHF. Adi Husada Nursing Journal, 3(2).
12. Fahri, S. (2021). Patofisiologi Konsep Klinis Proses-Proses Penyakit. In Patofisiologi. https://doi.org/10.4049/jimmunol.172.4.2595.
13. Fera DKK. (2017). Saturasi Oksigen Dengen Pulse Oxymetri Dalam 24 jam Pada Pasien Dewasa Terpasang ventilator di Ruang ICU RS. Panti Wilasa Citarum Semarang. Saturasi Oksigen Dengan Pulse Oximetry Dalam 24 Jam Pada Pasien Dewasa Terpasang Ventilator Di Ruang ICU Rumah Sakit Panti Wilasa Citarum Semarang, 2(1), 257–263. https://media.neliti.com/media/publications/243373-saturasi-oksigen-denganpulse- oximetry-d-d46bdd55.pdf
14. Hendrawan, M. R. (2019). manajemen jalan napas. ub press.
15. ismail marzuki dkk. (2021). covid-19 seribu satu wajah (janer simamarta abdul karim (ed.)). yayasan kita menulis.
16. Lalu, D. &. (2021). Pengaruh Pemberian Oksigen Dan Elevasi Kepala 30o Terhadap Tingkat Kesadaran Pada Pasien CHF. Jurnal Keperawatan Dan Fisioterapi (Jkf), 2(2), 102– 112.
17. Mundaki. (2016). Mengenal Penyakit Jantung. Kesehatan, 1 no 1, 12–15.
18. Muslich Anshori, S. I. (2019). metode penelitian kuantitatif. Airlangga University Press.
19. Muthahhari, M. (2019). Jaga jantungmu dari sekarang. sadra press.
20. Nasrudin, J. (2019). metodologi penelitian pendidikan (M. Taufik (ed.)). pt. panca tera firma.
21. Notoatmodjo, S. 2016, Metodologi Penelitian Kesehatan, Jakarta: Rineka Cipta.
22. Nurjanah, F. (2021). Hubungan peran petugas kesehatan dengan kekambuhan CHF di puskesmas Margangsa Yogyakarta. Jurnal Keperawatan, Volume 1, , 56–64.
23. Nurliana &, maelia zulianti. (2019). pengembangan alat ukur pengetahuan, sikap dan praktek masyarakat. Ilmiah, 2, 65–69.
24. Nurul anishah, dkk. (2021). Mengenal Penyakit Jantung. CV sains Indonesia.
25. Rayanu & Nur. (2020). Peningkatan Saturasi Oksigen Pada Pasien CHF melalui Pemberian Posisi Head Up. Ners Muda, 1(2), 114.
26. Riset Kesehatan Dasar (Riskesdas). (2022). Badan Penelitian dan Pengembangan Kesehatan Kementerian RI tahun 2022. Diakses: 19 Oktober 2022, dari http://www.depkes.go.id/resources/download/general/Hasil%20Riskesdas%20
27. Shinta & Tri. (2017). HAsuhan Keperawatan pada Klien dengan gangguan Sistem Persarafan. Jakarta : Salemba Medika
28. Sugiyono. 2018. Metode Penelitian Kuantitatif, Kualitatig, dan R&D, penerbit Alfabeta,Bandung
29. Tim Komisi Etika Penelitian Unika Atma Jaya. (2017). Pedoman Etika Penelitian Unika Atma Jaya (A. S. L. L. Hidajat (ed.); 2nd ed.). Lembaga Penelitian dan Pengabdian kepada Masyarakat Universitas Katolik Indonesia Atma Jaya.

30. Tim Pokja SDKI DPP PPNI. (2017). Standar Diagnosis Keperawatan Indonesia. PPNI.
31. Tim Pokja SIKI DPP PPNI. (2018). Standar Intervensi Keperawatan Indonesia. PPNI.
32. Tim Pokja SLKI DPP PPNI. (2019). Standar Luaran Keperawatan Indonesia. PPNI.
33. Virani, S. S., Alonso, A., Aparicio, H. J., Benjamin, E. J., Bittencourt, M. S., Callaway, C. W., … Tsao, C. W. (2021). Heart Disease and Stroke Statistics - 2021 Update: A Report From the American Heart Association. In Circulation (Vol. 143). https://doi.org/10.1161/CIR.0000000000000950
34. World Health Organization. (2020). WHO reveals leading causes of death and disability worldwide: 2000-2019
35. Wijayakusuma, H. (2019). Cegah dan Atasi Penyakit Jantung (3 (ed.); dede). wisma hijau.
36. Zendrato, W. (2020). Gerekan mencegah daripada mengobati Penyakit Jantung. Education, 8, 242–248.