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Application of the SAHAR Model in Emergency Nursing Management of Pulmonary Edema: A Case Report

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ABSTRACT

Background: *Structured clinical decision-making is essential in emergency management of cardiogenic pulmonary edema, yet practical application of frameworks like the SAHAR model remains unreported.*

Objective: *This case study describes the application of the SAHAR model in emergency nursing care for an elderly patient with cardiogenic pulmonary edema.*

Methods: *A qualitative case study was conducted at an emergency department in Indonesia. Data were collected through patient assessment, nursing intervention, and outcome evaluation. The nursing process was analyzed using the six SAHAR themes.*

Results: *The patient presented with chest pain, severe dyspnea, hypertension, tachypnea, hypoxemia, bilateral crackles, jugular vein distention, and peripheral edema. The SAHAR model guided the nurse to prioritize airway, breathing, and circulation; implement semi-Fowler positioning, oxygen therapy, furosemide, ISDN, and fluid monitoring; and achieve clinical improvement within the evaluation period.*

Discussion: *The structured decision-making process enabled rapid recognition of cardiogenic pulmonary edema, appropriate prioritization of life-threatening conditions, and timely evidence-based interventions aligned with pathophysiology. The SAHAR model provides a practical framework for emergency nursing in cardiogenic pulmonary edema. Further multicenter studies are warranted*

ABSTRAK

Latar Belakang: Pengambilan keputusan klinis yang terstruktur sangat penting dalam penanganan kegawatdaruratan edema paru kardiogenik, namun penerapan praktis kerangka kerja seperti model SAHAR belum banyak dilaporkan.

Tujuan: Studi kasus ini mendeskripsikan penerapan model SAHAR dalam asuhan keperawatan gawat darurat pada pasien lanjut usia dengan edema paru kardiogenik.

Metode: Studi kasus kualitatif dilakukan di unit gawat darurat di Indonesia. Data dikumpulkan melalui pengkajian pasien, intervensi keperawatan, dan evaluasi hasil. Proses keperawatan dianalisis menggunakan enam tema SAHAR.

Hasil: Pasien datang dengan keluhan nyeri dada, dispnea berat, hipertensi, takipnea, hipoksemia, suara napas *crackles* bilateral, distensi vena jugularis, dan edema perifer. Model SAHAR memandu perawat untuk memprioritaskan jalan napas, pernapasan, dan sirkulasi; menerapkan posisi semi-Fowler, terapi oksigen, pemberian furosemid dan ISDN, serta pemantauan cairan; dan mencapai perbaikan klinis dalam periode evaluasi.

Pembahasan: Proses pengambilan keputusan yang terstruktur memungkinkan pengenalan cepat terhadap edema paru kardiogenik, penentuan prioritas yang tepat untuk kondisi yang mengancam jiwa, serta intervensi berbasis bukti yang tepat waktu dan sesuai dengan patofisiologi. Model SAHAR menyediakan kerangka kerja praktis bagi keperawatan gawat darurat pada kasus edema paru kardiogenik. Studi multisenter lebih lanjut diperlukan..

INTRODUCTION

Pulmonary edema is a pathological condition characterized by excessive fluid accumulation in the pulmonary interstitium and alveoli, occurring acutely or chronically, resulting in impaired gas exchange and decreased lung compliance.(Assaad et al., 2018) Cardiogenic pulmonary edema specifically results from increased pulmonary capillary hydrostatic pressure due to left ventricular dysfunction, acute myocardial infarction, or severe hypertension, forcing fluid from pulmonary vessels into the interstitial and alveolar spaces.(Dong et al., 2023) This condition manifests as severe dyspnea, tachypnea, use of accessory muscles, cyanosis, and pink frothy sputum, and can rapidly progress to respiratory failure if not managed immediately.(Marti, 2020)

The prevalence of cardiovascular emergencies, including acute coronary syndrome (ACS), hypertensive crisis, and congestive heart failure (CHF), continues to rise globally, particularly among the elderly population.(Al Farisi & Saputro, 2025) In Indonesia, emergency nurses face unique challenges including limited resources, high patient loads, and inadequate training, which significantly impact clinical decision-making competencies.(Saharuddin et al., 2025) A study by Al Farisi and Saputro demonstrated that capillary refill time (CRT) >2 seconds and SpO_2 <90% are strong predictors of high acuity (Emergency Severity Index levels 1-2) requiring immediate intervention.(Al Farisi & Saputro, 2025) Furthermore, Sirojudin and Saputro found that decreased Glasgow Coma Scale (GCS) scores correlate strongly with increased fall risk measured by the Morse Fall Scale, highlighting the importance of comprehensive neurological assessment in emergency settings.(Sirojudin & Saputro, 2025)

Clinical decision-making is central to emergency nursing practice, particularly in trauma and critical care where rapid, accurate actions are essential.(Saharuddin et al., 2025) Recent research by Saharuddin et al. developed the SAHAR model (Steps to Acquaintance of Hypothesis in Achieving Recovery), which comprises six key themes: (1) recognize cues, (2) analyze cues, (3) prioritize hypothesis, (4) generate solutions, (5) take actions, and (6) evaluate outcomes. This model integrates analytical reasoning, prioritization, interprofessional collaboration, and reflective practice, offering a structured framework for emergency nurses to manage complex cases. However, the application of the SAHAR model in specific emergency conditions, such as cardiogenic pulmonary edema, has not yet been described in the literature.(Saharuddin et al., 2025)

Nursing interventions for pulmonary edema include semi-Fowler positioning, which has been shown to significantly improve oxygen saturation.(Qomaria & Putri, 2023) A case study by Qomaria and Putri demonstrated an increase in SpO_2 from 94% to 100% after 30 minutes of semi-Fowler positioning.(Qomaria & Putri, 2023) Other critical interventions include oxygen therapy, diuretic administration (e.g., furosemide) to reduce preload, vasodilators (e.g., nitrates) to decrease afterload and preload, and careful fluid management.(Assaad et al., 2018; Marti, 2020) Despite the availability of these evidence-based interventions, there remains a knowledge gap in understanding how emergency nurses systematically integrate clinical decision-making models into the holistic management of pulmonary edema, particularly in resource-limited settings such as Indonesia.

Therefore, this case study aimed to describe the integration of the SAHAR clinical decision-making model in emergency nursing care of an elderly patient with cardiogenic pulmonary edema complicating ACS, CHF, and hypertensive crisis at a regional general hospital in Ambarawa, Indonesia. The originality of this study lies in its explicit application of the SAHAR model to a specific emergency condition, providing a practical example for nurse educators, clinicians, and researchers seeking to enhance structured decision-making in emergency departments.

METHODS

Study Design and Setting

This study employed a qualitative case study design to explore the clinical decision-making process of an emergency nurse in managing a patient with acute pulmonary edema. The research was conducted at the Emergency Department

(ED) of a regional hospital in Indonesia, a provincial referral hospital in Central Java, Indonesia. The study was performed on March 14, 2026, during the patient's admission to the ED.

Participant

The participant was an 84-year-old male patient (initials Tn. T) who presented with chest pain, severe dyspnea, and was diagnosed with pulmonary edema secondary to Acute Coronary Syndrome (ACS), Congestive Heart Failure (CHF), and Hypertensive Heart Disease (HHD) with hypertensive crisis. The patient was alert with a Glasgow Coma Scale (GCS) score of 15 but appeared anxious due to shortness of breath. The case was selected because it represented a typical emergency presentation of cardiogenic pulmonary edema requiring immediate life-saving interventions.

Data Collection

Data were collected through a comprehensive emergency nursing assessment using the Emergency Severity Index (ESI) triage system, a primary survey (Airway, Breathing, Circulation, Disability, Exposure), and a secondary survey (anamnesis, physical examination, and diagnostic test review). All patient data, including vital signs (blood pressure 226/123 mmHg, heart rate 92 x/min, respiratory rate 24 x/min, SpO_2 94%, temperature 36.3°C), physical examination findings (crackles in both basal lungs, jugular vein distention, pitting edema +2 in both lower extremities), and diagnostic results (sinus rhythm on electrocardiography, blood glucose 105 mg/dL, normal complete blood count), were systematically documented using standard emergency nursing assessment forms. Nursing interventions were implemented based on the patient's condition, and outcomes were evaluated at 25 minutes post-intervention.

Research Instrument

The primary research instrument was the researcher, guided by a structured emergency nursing assessment format and the six themes of the SAHAR clinical decision-making model (recognize cues, analyze cues, prioritize hypothesis, generate solutions, take actions, and evaluate outcomes) developed by Saharuddin et al.(Saharuddin et al., 2025) The SAHAR model was used as an analytical framework to map the nursing process retrospectively.

Data Analysis

Data were analyzed retrospectively by mapping the chronological nursing process onto the six SAHAR model themes. The analysis included: (1) identifying critical cues from the primary survey, (2) analyzing their clinical significance, (3) prioritizing nursing diagnoses based on the ESI level and SDKI (2017),(2017) (4) generating evidence-based interventions derived from standard operating procedures and clinical guidelines by SIKI (2018) and SLKI (2019),(TIM POKJA SIKI DPP PPNI, 2018; TIM POKJA SLKI DPP PPNI, 2019) (5) documenting the actions taken, and (6) evaluating patient outcomes using objective parameters (vital signs, SpO_2, pain scale, urine output). Triangulation was performed by cross-referencing observational data, patient documentation, and intervention records to ensure data validity.

Ethical Considerations

The study was conducted as part of a clinical nursing education program at STIKes Estu Utomo. Patient data were anonymized using initials only. Written informed consent was obtained from the patient's legal representative before data collection. Confidentiality was maintained throughout the study.

RESULTS

The application of the SAHAR clinical decision-making model in the emergency nursing care of patient Tn. T with pulmonary edema is presented according to the six themes: recognize cues, analyze cues, prioritize hypothesis, generate solutions, take actions, and evaluate outcomes.

Recognize Cues

During the primary survey at 06:45, the emergency nurse identified the following critical cues from the patient:

1. Chief complaint: Chest pain on the left side described as a heavy pressure radiating to the left shoulder.
2. Airway: Patent, no abnormal breath sounds (snoring, gurgling, stridor absent).
3. Breathing: Respiratory rate 24 x/min, SpO_2 94% on room air, use of accessory muscles (sternocleidomastoid, intercostal), intercostal retractions, shallow breathing, crackles (fine to coarse) in both basal lungs on auscultation.
4. Circulation: Blood pressure 226/123 mmHg, heart rate 92 x/min, CRT >2 seconds, pale and moist skin, jugular vein distention in semi-Fowler position.
5. Disability: GCS 15 (E4 V5 M6), anxious expression, circumoral cyanosis, pain scale 5 (0-10) with characteristics (P: pain on activity, Q: heavy pressure, R: left chest radiating to left shoulder, S: scale 5, T: intermittent).
6. Exposure: Pitting edema ++/++ grade 2 in both lower extremities (pretibial and ankle), no trauma or deformities.

Supporting data from the secondary survey included: history of ACS, CHF, HHD with hypertensive crisis; physical examination showed hepatomegaly (liver palpable 3 cm below costal margin), S3 gallop, systolic murmur grade 2/6 at apex; diagnostic results showed sinus rhythm on ECG, GDS 105 mg/dL, and normal complete blood count.

Analyze Cues

The nurse analyzed the collected cues by correlating symptoms with clinical conditions:

1. Chest pain with radiating characteristics, combined with hypertension (226/123 mmHg) and history of heart disease (IHD, HHD), indicated acute coronary syndrome with possible myocardial ischemia.
2. Crackles, dyspnea (RR 24 x/min), SpO_2 94%, and use of accessory muscles indicated pulmonary edema with impaired gas exchange.
3. Bilateral pitting edema (+2), jugular vein distention, and S3 gallop indicated hypervolemia secondary to congestive heart failure.
4. CRT >2 seconds, pale moist skin, and weak peripheral pulses indicated ineffective peripheral perfusion due to increased blood pressure.
5. The patient's age (84 years) and history of hypertension, IHD, and HHD were identified as major risk factors for poor outcomes.

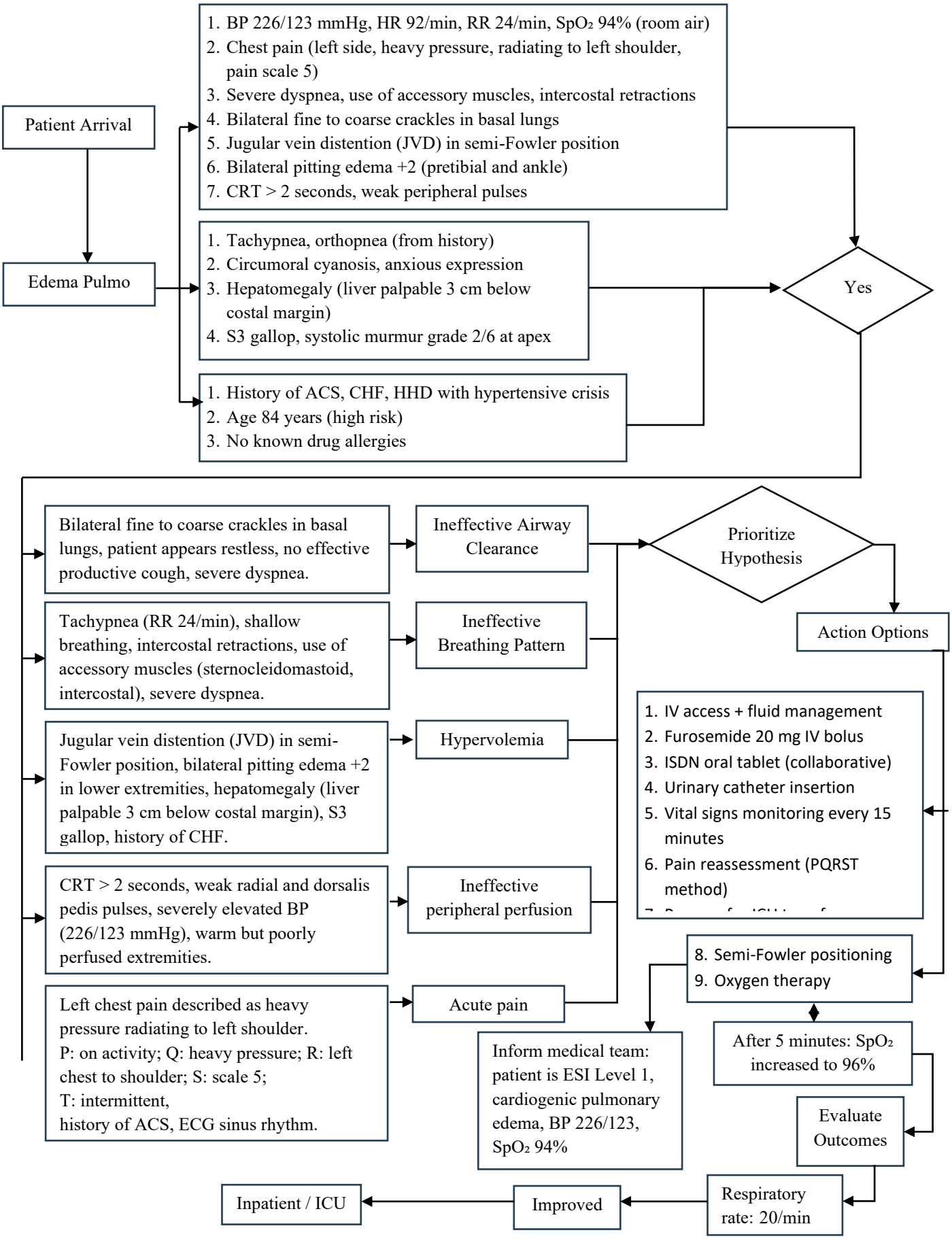
Prioritize Hypothesis

Using the Emergency Severity Index (ESI) triage system, the patient was classified as Level 1 (Resuscitation) because the patient required immediate life-saving interventions (Severe respiratory distress, SpO_2 <90% on room air, and risk of respiratory arrest). The nursing diagnoses were prioritized based on life-threatening conditions as follows:

Table 1 Prioritized Nursing Diagnoses

Priority	Nursing Diagnosis (SDKI 2017)	Etiology
1	Ineffective Airway Clearance (D.0001)	Hypersecretion
2	Ineffective Breathing Pattern (D.0005)	Decreased lung expansion
3	Acute Pain (D.0077)	Physiological injury agents (myocardial ischemia)

4	Hypervolemia (D.0022)	Impaired venous return
5	Ineffective Peripheral Perfusion (D.0009)	Increased blood pressure



Generate Solutions

Evidence-based nursing interventions were generated according to SIKI (2018)(Tim Pokja Siki DPP PPNI, 2018) and SLKI (2019)(TIM POKJA SLKI DPP PPNI, 2019) standards:

1. Airway management (I.01011): Maintain patent airway, head tilt-chin lift/jaw thrust if needed, suction if secretions present.
2. Oxygen therapy: Administer oxygen 2 L/min via nasal cannula to maintain SpO_2 ≥94%.
3. Positioning: Semi-Fowler position (45-90°) to improve lung expansion and decrease work of breathing.
4. Hemodynamic monitoring: Monitor vital signs every 15 minutes, including blood pressure, heart rate, respiratory rate, SpO_2, and CRT.
5. Fluid management: Administer IV RL 10 tpm; monitor intake and output strictly.
6. Pharmacological therapy (collaborative) : Administer furosemide 1 amp IV bolus for diuresis; administer ISDN oral for chest pain.
7. Urinary catheter insertion: Insert Foley catheter for accurate urine output monitoring.
8. Pain management: Identify pain characteristics, monitor vital signs before and after analgesics, document response.
9.

Take Actions

Immediate nursing actions implemented from 06:45 to 07:10 are presented in Table 2.

Table 2 Nursing Actions Implemented

Time	Intervention	Implementation Detail
06:45	Positioning	Semi-Fowler position (45°)
06:45	Oxygen therapy	Nasal cannula, 2 L/min
06:47	IV access	Palmar sinistra, size 22
06:50	Fluid therapy	RL infusion, 10 tpm
06:52	Diuretic (collaborative)	Furosemide 1 amp (20 mg) IV bolus
06:55	Vasodilator (collaborative)	ISDN oral tablet
06:58	Urinary catheter	Foley catheter inserted, initial output 250 cc
06:45-07:10	Vital signs monitoring	BP, HR, RR, SpO_2, CRT monitored continuously
07:00	Pain reassessment	PQRST method applied

Evaluate Outcomes

Evaluation was performed at 07:10 (25 minutes after initial intervention). The outcomes are presented in Table 3.

Table 3 Evaluation of Nursing Outcomes

Parameter	Pre-Intervention (06:45)	Post-Intervention (07:10)	Change	Criteria
Respiratory rate	24 x/min	20 x/min	Decreased by 4 x/min	Improved
SpO_2 (on nasal cannula)	94% (room air)	98%	Increased by 4%	Improved
Breathing pattern	Irregular, shallow	Regular, normal depth	Normalized	Improved
Dyspnea	Severe	Mild to moderate	Decreased	Improved
Pain scale (0-10)	5	4	Decreased by 1 point	Improved

Pain characteristics	P: on activity; Q: heavy pressure; R: left chest to shoulder; S: scale 5; T: intermittent	P: on activity; Q: heavy pressure; R: same; S: scale 4; T: intermittent	Slightly improved	Partially improved
Blood pressure	226/123 mmHg	112/78 mmHg	Decreased by 114/45 mmHg	Improved
Heart rate	92 x/min	92 x/min	No change	Stable
CRT	>2 seconds	<3 seconds	Slightly improved	Partially improved
Peripheral pulses	Weak	Palpable, strong	Improved	Improved
Urine output (post-catheter)	Not applicable	300 cc (first hour)	Diuresis achieved	Improved
Edema (lower extremities)	Pitting edema +2	Still present, decreased	Partially decreased	In progress
Patient report	"Sesak berat, nyeri dada"	"Sesak berkurang, nyeri agak berkurang"	Subjective improvement	Positive response
Patient appearance	Anxious, restless	More relaxed	Improved	Positive response

Summary of Outcome Achievement:

1. Achieved (4 criteria) : Respiratory rate improved (from 24 to 20 x/min), SpO_2 improved (94% to 98%), breathing pattern normalized, blood pressure controlled (226/123 to 112/78 mmHg).
2. Partially achieved (4 criteria) : Pain scale decreased (5 to 4), CRT improved (>2 to <3 seconds), edema partially decreased, peripheral pulses improved.
3. Ongoing monitoring required: Edema still present, continued diuresis needed, pain management continued.

The ISDN oral was documented as effective for pain reduction. The furosemide injection resulted in urine output of 300 cc within the first hour, indicating effective diuresis. The patient was subsequently prepared for transfer to the Intensive Care Unit (ICU) for continued monitoring and management.

DISCUSSION

Interpretation of Key Findings

This case study demonstrated that the application of the SAHAR clinical decision-making model in emergency nursing care for an 84-year-old patient with cardiogenic pulmonary edema resulted in significant clinical improvements within 25 minutes of intervention. The patient's respiratory rate decreased from 24 to 20 breaths per minute, SpO_2 increased from 94% to 98% on nasal cannula oxygen 2 L/min, pain scale reduced from 5 to 4, blood pressure decreased from 226/123 mmHg to 112/78 mmHg, and urine output reached 300 cc after furosemide administration. These findings indicate that structured clinical decision-making using the SAHAR model encompassing recognize cues, analyze cues, prioritize hypothesis, generate solutions, take actions, and evaluate outcomes, effectively guides emergency nurses in managing acute pulmonary edema.

The improvement in oxygenation and reduction in respiratory rate observed in this case align with the physiological principles of pulmonary edema management. Pulmonary edema occurs when excessive fluid accumulates in the interstitial space and alveoli of the lungs, resulting in impaired gas exchange and decreased lung compliance.(Assaad et al., 2018) In cardiogenic pulmonary edema, increased pulmonary capillary hydrostatic pressure due to left ventricular dysfunction forces fluid from pulmonary vessels into the interstitial and alveolar spaces.(Dong et al., 2023) The interventions provided semi-Fowler positioning, oxygen therapy, furosemide diuresis, and ISDN vasodilation directly address the pathophysiological mechanisms of fluid accumulation and increased afterload.

The semi-Fowler position (45-90 degrees) has been shown to significantly improve lung expansion, decrease work of breathing, and increase oxygen saturation in patients with pulmonary edema. A previous case study by Qomaria and Putri demonstrated an increase in SpO_2 from 94% to 100% after 30 minutes of semi-Fowler positioning.(Qomaria & Putri, 2023) In this case, the combination of semi-Fowler positioning with oxygen therapy contributed to the rapid improvement in SpO_2 from 94% to 98% within 25 minutes, consistent with these previous findings.

The administration of furosemide 1 amp IV bolus resulted in urine output of 300 cc within the evaluation period, indicating effective diuresis and reduction of preload. Furosemide, a loop diuretic, reduces preload by evacuating excess fluid, thereby decreasing pulmonary capillary hydrostatic pressure and promoting fluid reabsorption from the alveolar and interstitial spaces.(Assaad et al., 2018) The reduction in blood pressure from 226/123 mmHg to 112/78 mmHg following ISDN administration reflects successful afterload reduction, which decreases myocardial oxygen demand and improves left ventricular function.

Comparison with Previous Studies

The clinical decision-making process observed in this case study is consistent with the SAHAR model developed by Saharuddin et al., which comprises six key themes: recognize cues, analyze cues, prioritize hypothesis, generate solutions, take actions, and evaluate outcomes.(Saharuddin et al., 2025) In this study, the emergency nurse successfully recognized critical cues including chest pain characteristics (scale 5, described as heavy pressure radiating to the left shoulder), vital sign abnormalities (hypertension 226/123 mmHg, tachypnea 24 x/min, SpO_2 94%), and physical examination findings (crackles in both basal lungs, jugular vein distention, pitting edema +2). These findings align with Tanner's clinical judgment model, which emphasizes pattern recognition and situational awareness as foundations of clinical decision-making.(Saharuddin et al., 2025)

The prioritization of nursing diagnoses using the Emergency Severity Index (ESI) Level 1 (Resuscitation) reflects the high acuity of the patient's condition. Al Farisi and Saputro demonstrated that capillary refill time (CRT) >2 seconds and SpO_2 <90% are strong predictors of ESI levels 1-2 requiring immediate intervention.(Al Farisi & Saputro, 2025) In this case, although SpO_2 was 94% (above 90%), the combination of severe hypertension, tachypnea, chest pain, and bilateral crackles justified the ESI Level 1 classification.

The nursing diagnoses formulated ineffective airway clearance, ineffective breathing pattern, acute pain, hypervolemia, and ineffective peripheral perfusion, are consistent with the Indonesian nursing diagnosis standards (SDKI) for patients with cardiogenic pulmonary edema.(TIM POKJA SDKI DPP PPNI, 2017) These diagnoses address both the direct pulmonary consequences of fluid accumulation and the underlying cardiovascular pathophysiology.

The effectiveness of non-invasive oxygen therapy via nasal cannula at 2 L/min in this case is supported by the literature. While high-flow nasal cannula (HFNC) has been shown to significantly reduce respiratory rate and dyspnea within 30 minutes in acute pulmonary edema patients,(Ko et al., 2020) conventional oxygen therapy remains effective for mild to moderate hypoxemia. Marti reported that non-invasive ventilation (NIV) is more effective than standard oxygen therapy in improving oxygenation, reducing dyspnea, acidosis, and hypercapnia in acute cardiogenic pulmonary edema.(Marti, 2020) However, in this case, the patient's condition improved adequately with conventional oxygen therapy, and intubation or NIV was not required.

The resolution of pulmonary edema in this case within a short timeframe is consistent with the pathophysiology of hydrostatic pulmonary edema. Fremont et al. analyzed pulmonary edema fluid from patients with post-obstructive pulmonary edema and found an average edema fluid-to-plasma protein ratio of 0.54 ± 0.15, supporting a hydrostatic mechanism for edema formation.(Bhattacharya et al., 2016) In hydrostatic pulmonary edema, the rate of alveolar fluid clearance is preserved at 10-20% per hour, compared to impaired clearance (0-3%/hr) in high-permeability edema such as ARDS.(Bhattacharya et al., 2016) This explains the rapid clinical improvement observed in this patient.

The use of ISDN for chest pain management in this case is appropriate given the patient's diagnosis of Acute Coronary Syndrome (ACS) with hypertensive crisis. Nitrates cause venodilation at low doses, reducing preload, and

at higher doses cause arteriolar dilation, reducing afterload.(Assaad et al., 2018) Nitrates also dilate coronary arteries, increasing myocardial oxygenation and decreasing cardiac workload. The reduction in pain scale from 5 to 4 after ISDN administration indicates effective angina relief.

Limitations

This study has several limitations that should be acknowledged. First, as a single case study, the findings cannot be generalized to all patients with cardiogenic pulmonary edema. The patient's specific characteristics elderly age (84 years), multiple comorbidities (ACS, CHF, HHD), and hypertensive crisis, may limit applicability to younger patients or those with different etiologies of pulmonary edema. Second, the absence of quantitative extravascular lung water (EVLW) measurement, such as by transpulmonary thermodilution (TPTD) or lung ultrasound (LUS) B-line scoring, limits the objective assessment of pulmonary edema severity and resolution. Assaad et al. emphasized that LUS has a diagnostic accuracy of >95% sensitivity and specificity for alveolar-interstitial syndrome and provides real-time feedback on EVLW changes.(Assaad et al., 2018) Third, the evaluation period of 25 minutes is relatively short; longer-term outcomes including 28-day mortality, ICU admission rate, and readmission rates were not assessed. Fourth, the study did not measure biomarkers such as BNP or NT-proBNP, which are useful for distinguishing cardiogenic from non-cardiogenic edema and assessing heart failure severity.(Ko et al., 2020) Fifth, the potential for observer bias exists as the same nurse who provided care also evaluated outcomes, although this reflects real-world clinical practice.

Implications for Nursing Practice and Research

The successful application of the SAHAR model in this case has several implications for emergency nursing practice. First, the SAHAR model provides a structured framework that can enhance clinical decision-making competencies, particularly for less experienced nurses who may rely on more analytical approaches rather than intuition.(Saharuddin et al., 2025) Integrating the SAHAR model into emergency nursing education and training programs may improve systematic assessment and timely intervention in critical cases such as pulmonary edema. Second, the model's emphasis on recognizing cues and analyzing symptoms aligns with the ESI triage system, supporting its use as a complementary cognitive tool in high-pressure environments.

The findings also highlight the importance of evidence-based nursing interventions for pulmonary edema. Semi-Fowler positioning should be implemented immediately upon recognition of dyspnea and hypoxemia, as it has been shown to significantly improve oxygen saturation within 30 minutes.(Qomaria & Putri, 2023) Oxygen therapy should be initiated to maintain SpO_2 ≥90%, with careful titration to avoid hyperoxia. Loop diuretics such as furosemide remain first-line therapy for fluid overload, and urinary catheterization facilitates accurate output monitoring. Vasodilators such as nitrates are indicated for hypertensive patients with acute cardiogenic pulmonary edema to reduce afterload and preload.

For future research, multicenter studies with larger sample sizes are needed to validate the SAHAR model across diverse emergency settings and patient populations. Randomized controlled trials comparing SAHAR-guided care versus standard care could evaluate the model's impact on patient outcomes, including mortality, intubation rates, and length of hospital stay. Additionally, studies examining the correlation between SAHAR implementation and nurse-reported outcomes such as decision-making confidence, diagnostic accuracy, and time-to-intervention would provide valuable insights. The integration of lung ultrasound for objective EVLW quantification in future case studies would enhance the assessment of pulmonary edema resolution.(Mayo et al., 2019) Finally, the SAHAR model could be adapted for other emergency conditions such as acute respiratory distress syndrome, sepsis, or traumatic brain injury, where rapid, structured decision-making is critical.

CONCLUSION

The integration of the SAHAR clinical decision-making model into emergency nursing care for cardiogenic pulmonary edema provides a structured, evidence-based framework that enhances systematic patient assessment, prioritization of life-threatening conditions, and timely implementation of targeted interventions. This case study confirms that the model's sequential approach from cue recognition to outcome evaluation, supports rapid clinical improvement by facilitating appropriate oxygen therapy, diuresis, vasodilation, and positioning.

LIMITATIONS AND RECOMMENDATION

The SAHAR model addresses a critical gap in emergency nursing by offering a replicable cognitive tool that is particularly valuable in resource-limited settings where high patient loads and time constraints challenge clinical reasoning. Widespread adoption of this model in emergency nursing education and training may improve decision-making consistency, reduce diagnostic delays, and ultimately contribute to better patient outcomes in acute cardiogenic pulmonary edema. Future multicenter research with larger samples and objective measures such as lung ultrasound or biomarker analysis is warranted to validate the model's effectiveness across diverse emergency contexts and to explore its applicability to other acute respiratory and cardiovascular emergencies..

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