PROFESIONAL HEALTH JOURNAL
Volume 7, No. 2, June 2026 (Page. 725-731)
Available Online at https://www.ojsstikesbanyuwangi.com/index.php/PHJ/index
E-ISSN 2715-6249
DOI: https://doi.org/10.54832/phj.v7i2.1244

# *Analysis Of The Impact Of The Semi-Fowler Position On Oxygen Levels And Breathing Frequency In CKD Patients within The Emergency Departement Of Rs Sint Carolus Jakarta*

**Elfrida Jennifer Crystella[a] * | Maria Astrid, M.Kep.,Sp.KMB., PhD[b]**
[a] STIKes Sint Carolus,
[b] STIKes Sint Carolus
*Corresponding Author: 202417014@stik-sintcarolus.ac.id

***ARTICLE INFORMATION***

***Article history***
*Received (4 July 2025)*
*Revised (17 July 2025)*
*Accepted (18 July 2025)*

***Keywords***
*Chronic Kidney Disease*
*Semi Fowler*
*Respiratory rate*
*Oxygen Saturation*
*Emergency Nursing*

**ABSTRACT**

***Introduction:*** *Chronic kidney disease, which involves lasting impairment of kidney function, can cause respiratory issues among various other systemic complications. Breathlessness is a common symptom that patients face, and if it goes unaddressed, it can worsen their overall health condition..*
***Objectives:*** *The aim of this study is to assess the effectiveness of the semi-Fowler position in boosting oxygen saturation and decreasing the respiratory rate in chronic kidney disease patients receiving treatment in the Emergency Department.*
***Methods:*** *This investigation adopted a descriptive case study method focusing on two individuals who experienced breathing difficulties due to chronic kidney disease. Interventions included the provision of oxygen and repositioning the patients into the semi-Fowler position for four hours of monitoring. The gathered data included oxygen saturation levels and respiratory rates measured before and after the intervention.*
***Results:*** *After being positioned in the semi-Fowler setup, both patients exhibited notable improvements in oxygen saturation and reductions in respiratory rates. Oxygen saturation levels rose from 83–94% to 99–100%, while the respiratory rate declined from 30–32 breaths per minute to 26–28 breaths per minute.*
***Conclusions:*** *Positioning patients in the semi-Fowler posture has been shown to effectively enhance respiratory function in individuals with chronic kidney disease within the emergency setting. This method can serve as a first-line non-invasive nursing intervention to promote patient comfort and help maintain the stability of their condition.*

## Introduction

According to WHO (Levin et al., 2020), kidney disease accounted for 254,028 global deaths in 2019, with a higher mortality rate in men compared to women. The global average mortality rate reached 15.6 per 100,000 population, the highest in Nicaragua (73.9) and the lowest in Canada. In Indonesia, the prevalence of Chronic Kidney Disease (CKD) increased from 2% in 2023 to 3.8% in 2024 (Riskesdas, 2023). Age above 75 years has the highest prevalence (0.6%), and the prevalence in men (0.3%) is higher than in women. The numbers increase with age, starting from 0.3% (ages 35–44), 0.4% (45–54), to 0.5% (55–74). North Kalimantan recorded the highest prevalence (0.64%), while West Sulawesi had the lowest (0.18%). In DKI Jakarta, 24,981 cases were recorded, or about 0.22% (Kebijakan Pembangunan et al., 2023). The number of new patients has tripled compared to 2017, which has also led to an increase in the number of active patients. The proportion of Chronic Kidney Failure patients undergoing hemodialysis in Indonesia is 19.33%. The highest prevalence of those undergoing hemodialysis is in the province of DKI Jakarta at 38.71%, while the lowest prevalence is in North Maluku Province at 4.88%

PROFESIONAL HEALTH JOURNAL
Volume 7, No. 2, June 2026 (Page. 725-731)
Available Online at https://www.ojsstikesbanyuwangi.com/index.php/PHJ/index
E-ISSN 2715-6249
DOI: https://doi.org/10.54832/phj.v7i2.1244

(Riskesdas, 2018). Based on data from BPJS Kesehatan, as many as 134,057 chronic kidney failure patients underwent hemodialysis procedures throughout 2024. Meanwhile, a report from the Indonesian Society of Nephrology (Pernefri) in 2023 showed that the cumulative number of patients undergoing dialysis reached 60,526, with a total prevalence of 127,900 patients.

Chronic Kidney Disease (CKD) is a progressive disorder of kidney function that causes metabolic disturbances, fluid and electrolyte imbalances, and the accumulation of nitrogen waste in the body (Ronco & et al, 2020). CKD has become a significant public health issue due to its increasing prevalence, particularly in developing countries like Indonesia (Riskesdas, 2023). One of the complications often encountered is respiratory distress, which can be caused by pulmonary edema, anemia, and metabolic acidosis Xie & et al, (2021); Sahensolar (2021). Data from the Emergency Department of RS Sint Carolus showed that during May–June 2025, there were 210 patients with CKD. Some of these patients were those who routinely underwent hemodialysis at RS Sint Carolus, while others were new patients diagnosed with CKD or patients who already had medical records at RS Sint Carolus.

Emergency Department (ED), CKD patients often present with acute dyspnea, characterized by the use of accessory respiratory muscles, tachypnea, and decreased oxygen saturation. However, non-pharmacological interventions such as the semi-Fowler position have not yet become the standard initial procedure. However, this position has not yet become a standard initial procedure. In fact, this position has been physiologically proven to reduce diaphragm pressure, increase lung expansion, and improve alveolar ventilation (Aprioningsih et al., 2021).

Previous research shows that the semi-Fowler position is effective in improving respiratory function. Wardani (2023) found an increase in oxygen saturation and a decrease in respiratory rate in CKD patients after the application of the semi-Fowler position combined with deep breathing exercises. Similar results were also found by Sari et al., (2023), which showed improvement in breathing patterns and stabilization of $SpO_2$ within 3x24 hours of intervention. However, most studies were conducted in inpatient wards or ICUs, not in the ER. There is little literature specifically evaluating the effectiveness of the semi-Fowler position in the short term (e.g., 1×4 hours) for CKD patients in the ER. Additionally, aspects of patient comfort and rapid clinical response to position changes are still under-researched scientifically.

Repositioning the patient in the semi-Fowler position is one of the simple and cost-effective nursing interventions that can be directly applied. By optimizing lung expansion through this position, tissue oxygenation can improve without the need for initial invasive or pharmacological interventions (Prischeilla et al., 2024; Imamura & et al, 2022). The lack of application of the semi-Fowler position as part of initial nursing interventions in the emergency department and the suboptimal use of simple evidence-based interventions have prompted the author to raise this topic. In addition, this research is important to strengthen the role of nursing in the acute management of patients with CKD.

The aim of this study is to determine the effectiveness of the semi-Fowler position in improving oxygen saturation and respiratory rate in CKD patients treated in the Emergency Department (ED). This research contributes scientifically to emergency nursing practice by emphasizing the importance of evidence-based non-pharmacological interventions. The results are expected to serve as a basis for developing standard nursing protocols for CKD patients in the emergency room and to improve the efficiency of nursing services.

PROFESIONAL HEALTH JOURNAL
Volume 7, No. 2, June 2026 (Page. 725-731)
Available Online at https://www.ojsstikesbanyuwangi.com/index.php/PHJ/index
E-ISSN 2715-6249
DOI: https://doi.org/10.54832/phj.v7i2.1244

## Methods

This study uses a quantitative method with a pre and post-test design without a control group to evaluate the effectiveness of the semi-Fowler position in improving oxygen saturation and respiratory rate in CKD patients in the emergency department of RS Sint Carolus. The population in this report consists of patients who came to the Emergency Department of RS Sint Carolus. The samples were selected purposively, with the following criteria: (1) diagnosed with CKD; (2) presenting with complaints of shortness of breath; and (3) having complete medical and nursing documentation available. Two patients were selected as samples: Mr. P as the primary case, and Mrs. H as the comparison case. Monitoring was carried out for approximately 4 hours in June 2025. Data were collected through observation using a digital oximeter and a Bed Side Monitor (BSM), then recorded on an observation sheet. Patients were placed in a semi-Fowler's position, which is a position in which a person is placed in a half-sitting posture with support in the form of pillows under the head and shoulders; the knees are usually bent and supported with a pillow to help maintain the position. Measurements were taken before and after the intervention for 1×4 hours. Data analysis was carried out descriptively by comparing the values before and after the intervention.

.

## Results

### Nursing Assessment

**Tabel 1.** Nursing Assessment

| | Mr. P | Mrs. H |
|---|---|---|
| **Date of Hospital Admission** | June 8, 2025 | June 11, 2025 |
| **Medical Diagnosis** | CKD stage 5 ND, Pulmonary Edema, CAD | CKD stage 5 ND, Pulmonary Edema, Dilated Cardiomyopathy |
| **Chief Complaint** | Shortness of breath, shallow breathing, right upper abdominal pain | Shortness of breath, leg swelling for approximately 1 week |
| **Medical History** | Unaware of any previous illnesses | History of CKD stage 5 ND, dilated cardiomyopathy, fluid restriction 600 cc/day |
| **General Condition** | Appeared severely ill, GCS 15, dyspnea, using accessory muscles. Vital signs: BP 86/62 mmHg, HR 117 bpm, RR 26 breaths/min, SpO2 94% with nasal cannula 6 lpm, Temp 36 °C | Appeared severely ill, GCS 15, dyspnea, anemia, leg edema, using accessory muscles. Vital signs: BP 80/50 mmHg, HR 75 bpm, RR 32 breaths/min, SpO2 83% on room air |

(Source: Primary Data, 2025)

PROFESIONAL HEALTH JOURNAL
Volume 7, No. 2, June 2026 (Page. 725-731)
Available Online at https://www.ojsstikesbanyuwangi.com/index.php/PHJ/index
E-ISSN 2715-6249
DOI: https://doi.org/10.54832/phj.v7i2.1244

**Interventions and Evaluation**

**Tabel.2** Interventions and Evaluation

| No. | Initial | Pre Intervensi | Post Intervensi |
|---|---|---|---|
| | | **TTV & Oxygenation** | **Objective** |
| **1.** | Mr. P | BP 86/62 mmHg<br>HR 117 bpm<br>RR 26 breaths/min<br>SpO2 94% O2 NC 6 lpm | BP 76/49 mmHg<br>HR 133 bpm<br>RR 26 breaths/min<br>SpO2 99% O2 NC 15 lpm |
| **2.** | Mrs. H | BP 80/50 mmHg<br>HR 75 bpm<br>RR 32 breaths/min<br>SpO2 83% on room air | BP 67/46 mmHg<br>HR 147 bpm<br>RR 28 breaths/min<br>SpO2 87% O2 NRM 15 lpm |

(Source: Primary Data, 2025)

## Discussion

### Pre Intervention

Shortness of breath and ineffective breathing patterns are common manifestations in stage V CKD patients. **Case 1 (Mr. P):** Mr. P, a patient with CKD stage 5 ND and complications of pulmonary edema and CAD, was admitted to the Emergency Department with an oxygen saturation of 94% using a nasal cannula at 6 lpm and a respiratory rate of 30 breaths/minute. **Case 2 (Ms. H):** Ms. H, a patient with CKD 5 ND with pulmonary edema, arrived with an initial oxygen saturation of 83% (without oxygen) and a respiratory rate of 32 breaths/minute.

### Post Intervention

**Case 1 (Mr. P):** Through the intervention of the semi-Fowler position and oxygen administration, there was an increase in $SpO_2$ to 100% and a decrease in RR to 26–28 times/minute within 4 hours. A reduction in the use of accessory respiratory muscles and subjective improvement in dyspnea complaints were also achieved. The literature review supports these results. Wardani (2023) showed that the semi-Fowler position intervention increased $SpO_2$ to 98–100% and reduced RR. A similar finding was reported by Prischeilla et al., (2024), that the semi-Fowler position improves lung ventilation through the gravitational effect that enhances thoracic expansion and increases oxygenation.

**Case 2 (Ms. H):** After administering the semi-Fowler position and oxygen (NC 6 lpm, followed by NRM 15 lpm), there was a gradual increase in oxygen saturation to 96–97% and a decrease in respiratory rate to 20–26 breaths/minute. However, the improvement was slower compared to Case 1, suspected due to a more severe heart condition (EF 22%, LV dilation, high troponin). The delayed response in Case 2 is consistent with the pathophysiological theory: in CKD with dilated cardiomyopathy, the response to respiratory intervention tends to be slow because tissue perfusion and the heart's ability to pump oxygenated blood are already impaired. The literature by Kandou Manado et al., (2024) also mentions that patients with a combination of CKD and severe hypervolemia take longer to stabilize their oxygen saturation.

From these two cases, the semi-Fowler position proved effective as a nursing intervention to improve ineffective breathing patterns in CKD patients. Significant changes in vital signs

PROFESIONAL HEALTH JOURNAL
Volume 7, No. 2, June 2026 (Page. 725-731)
Available Online at https://www.ojsstikesbanyuwangi.com/index.php/PHJ/index
E-ISSN 2715-6249
DOI: https://doi.org/10.54832/phj.v7i2.1244

occurred, particularly an increase in oxygen saturation and a decrease in RR, in line with the specific research objectives. There is effectiveness in oxygen saturation and a decrease in RR, as well as increased comfort from the reduced complaints of shortness of breath in both patients. The results of this study, along with the literature, reinforce the recommendation to apply the semi-Fowler position for CKD patients with acute respiratory distress. The results also reinforce the findings of Wardani (2023), Kandou Manado et al., (2024), and Prischeilla et al., (2024), which affirm that improved lung ventilation and comfort for CKD patients can be achieved with the semi-Fowler position.

## Conclusion

Based on the assessment, intervention, and evaluation results of both cases of CKD 5 ND patients experiencing ineffective breathing patterns, the application of the semi-Fowler position proved effective in increasing oxygen saturation and reducing the respiratory rate, in accordance with the objectives and problem formulation of this case report. The increase in SpO2 and decrease in RR, along with the reduced use of accessory respiratory muscles and the decrease in subjective complaints of shortness of breath, indicate that this intervention is capable of clinically improving the patient's respiratory status. Although the response speed varies among patients (influenced by heart condition and perfusion), overall, the semi-Fowler position can be applied as an effective independent nursing intervention to address ineffective breathing patterns in CKD patients in the emergency department of RS Sint Carolus.

## Acknowledgments

I would like to express my sincere gratitude to all those who have supported me throughout the process of completing this project. First and foremost, I extend my appreciation to my supervisor and mentors for their valuable guidance, constructive feedback, and encouragement, which have been instrumental in the completion of this study. I am deeply thankful to the medical and nursing staff in the Emergency Department RS Sint Carolus, who provided assistance and facilitated access to the necessary data and resources. Their cooperation and dedication were essential to the implementation of this research. I also wish to thank my colleagues and peers for their insightful discussions and moral support, which have contributed significantly to the development of this project.

## References

Aditama, N. Z., Kusumajaya, H., & Fitri, N. (2024). *Faktor-Faktor Yang Berhubungan Dengan Kualitas Hidup Pasien Gagal Ginjal Kronis.* http://jurnal.globalhealthsciencegroup.com/index.php/JPPP

Al-Olayan, M. A., Al-Qahtani, A. H., & Ahmed, A. E. (2021). *The effectiveness of breathing exercises on dyspnea in CKD patients. International Journal of Nursing Studies*. *116*(103497).

Aprioningsih, E., Susanti, I., & Muti, D. (2021). *Pengaruh posisi semi fowler terhadap kestabilan pola napas pasien CKD. Jurnal Keperawatan Medik*. *10*.

Erpiyana, R., Djamaludin, D., & Andoko, A. (2024). Perbandingan Kualitas Tidur Pasien Gagal Ginjal Kronik dengan Komorbid Hipertensi dan Diabetes Mellitus yang Menjalani Hemodialisa di Rumah Sakit Pertamina Bintang Amin Bandar Lampung.

*Malahayati Nursing Journal*, *6*(5), 2024–2035. https://doi.org/10.33024/mnj.v6i5.11070

Hawks, J. H. (2014). *Keperawatan Medikal Bedah* (3rd ed., Vol. 1).

Imamura, F., & et al. (2022). *Effects of body position on lung function and oxygenation in patients with CKD*. *23*.

Kandou Manado, R. D., Inkiriwang, P. I., Emnina Sembiring, E. I., Victoria Fernandez, G. I., & Katuuk I Program Studi Ilmu Keperawatan Fakultas Kedokteran, M. I. (2024). *Analisis Asuhan Keperawatan Pada Pasien Penyakit Ginjal Kronik dengan Intervensi Posisi Semi Fowler dan Edukasi Pencegahan Hipervolemia di Ruang Perawatan Irina C3 RSUP Prof dr. R.D Kandou Manado*. *15*.

Kebijakan Pembangunan, B., Kementerian, K., & Ri, K. (2023). *SKI 2023 Dalam Angka Kementrian Kesehatan Republik Indonesia*.

Kim, J. H., & Park, S. H. (2024). Diaphragmatic breathing exercise in CKD patients: Effects on pulmonary function and quality of life. *Journal of Clinical Nursing*, *33*(4), 567–574.

Levin, A., Stevens, P. E., Cores, J., & et al. (2012). *KDIGO 2012 Clinical Practice Guideline for the Evaluation and Management of Chronic Kidney Disease*. *3*(1). www.publicationethics.org

Levin, A., Tonelli, M., Bonventre, J., Coresh, J., Donner, J.-A., & et all. (2020). *Global kidney health 2017 and beyond: a roadmap for closing gaps in care, research, and policy*. *390*(10105).

Prischeilla, E., Erika, G., & Mario, P. (2024). Pengaruh posisi semi fowler terhadap saturasi oksigen. *Jurnal Keperawatan Indonesia, 15*(1), 45–52.

Purnamayanti, N. K. D., Tondok, S. B., Susasnto, W. H. A., & Rohmani, R. (2023). Impact of Semi-Fowler's Position in Chronic Heart Failure (CHF) Patients: Scoping Review. *Jurnal Penelitian Pendidikan IPA*, *9*(11), 1229–1236. https://doi.org/10.29303/jppipa.v9i11.5074

Riskesdas. (2018). *Laporan Nasional Riskesdas 2018*.

Riskesdas. (2023). *Laporan Nasional Riskesdas 2023*.

Ronco, P., & et al. (2020). KDIGO 2020 Clinical Practice Guideline for Diabetes Management in Chronic Kidney Disease. *Kidney International*, *98*(4), S1–S115. https://doi.org/10.1016/j.kint.2020.06.019

Sahensolar, R. (2021). Sistem Triage dan Manajemen Kegawatdaruratan. *Jurnal Gawat Darurat*, *5*(1), 33–40.

Sari, D. S. I., Nistiandani, A., Siswoyo, & Umayanah. (2023). Semi-Fowler Positioning in CKD. *JKMI*, *2*(1), 109–114.

Setia Indah Sari, D., & Nistiandani, A. (2023). An Application of Semi-Fowler Positioning to Overcome Nursing Problems Ineffective Breath Patterns in Clients with Chronic Kidney Disease: a Case Study ARTICLE INFO ABSTRACT. *Jurnal Kegawatdaruratan Medis Indonesia*, *2*(1), 109–114. https://ebsina.or.id/journals/index.php/jkmi

Shi, Y., Ma, W., Li, Y., & Chen, Y. (2023). Respiratory dysfunction in patients with chronic kidney disease: A comprehensive review. *Journal of Renal Care*, *49*(1), 23–31.

Soemah, E. N., Afista, S., & Haryanto, A. (2024). The Effect of Giving Semi Fowler Position in Reducing Ineffective Breathing in Chronic Kidney Disease (CKD) Patients at RSUD Ibnu Sina Gresik Hospital (Case Study Research). In *JSRET (Journal of Scientific* (Vol. 3, Issue 1).

Stevens, P. E., Ahmed, S. B., Carrero, J. J., Foster, B., Francis, A., Hall, R. K., Herrington, W. G., Hill, G., Inker, L. A., Kazancıoğlu, R., Lamb, E., Lin, P., Madero, M., McIntyre, N., Morrow, K., Roberts, G., Sabanayagam, D., Schaeffner, E., Shlipak, M., … Levin, A. (2024). KDIGO 2024 Clinical Practice Guideline for the Evaluation and Management of Chronic Kidney Disease. *Kidney International*, *105*(4), S117–S314. https://doi.org/10.1016/j.kint.2023.10.018

Subagiartha, F. S., Mulyadi, & Malara, R. T. (2024). Posisi Semi Fowleruntuk Meningkatkan Saturasi Oksigen pada Pasien dengan Chronic Kidney DiseasediIntensive Care Unit. *Jurnal Penelitian Kesehatan Suara Forikes*, *15*.

Tuttle, K. R., Alicic, R. Z., & Bakris, G. L. (2022). Management of chronic kidney disease: New approaches and insights. *The New England Journal of Medicine*, *387*(10), 924–934.

Wardani, I. K. (2023). *Asuhan Keperawatan Pola Napas Tidak Efektif Pada Pasien CKD di Ruang Instalasi Darurat Rumah Sakit PKU Muhammadiyah Gombong*.

Xie, Y., Bowe, B., Mokdad, A. H., Xian, H., Yan, Y., Li, T., & Al-Aly, Z. (2021). Analysis of the Global Burden of Disease study highlights the increasing burden of CKD. *The Lancet*, *398*(10302), 1203–1215.

Xie, Y., & et al. (2021). Epidemiology and burden of CKD. *Nature Reviews Nephrology*, *17*(3), 151–163.