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# Clinical Nursing Interventions and Their Contribution to Stability in Hemodialysis Patients with Chronic Kidney Disease

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***Abstrak*****:** *Chronic kidney disease is a progressive condition requiring long-term hemodialysis and is associated with a high risk of physiological instability. Clinical nursing interventions play a strategic role in maintaining patient stability during hemodialysis procedures. This study aimed to analyze the relationship and contribution of clinical nursing interventions to the stability of patients with chronic kidney disease undergoing hemodialysis. A quantitative approach with a cross-sectional observational analytic design was employed. The study sample consisted of patients receiving routine hemodialysis who met the inclusion criteria. Data were collected using structured observation sheets of nursing interventions and measurements of patient stability indicators, and analyzed using correlation and linear regression tests. The results demonstrated a positive and statistically significant relationship between clinical nursing interventions and patient stability. Regression analysis indicated that nursing interventions contributed significantly to patient stability after controlling for clinical factors. These findings confirm that clinical nursing interventions are a critical determinant of patient stability and safety in hemodialysis care. Strengthening evidence-based nursing practices is therefore recommended to improve the quality of hemodialysis services and clinical outcomes.*

***Keywords : chronic kidney disease, clinical nursing intervention, hemodialysis, patient stability, renal nursing.***

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## INTRODUCTION

Chronic kidney disease (CKD) is a progressive and irreversible condition that frequently culminates in end-stage renal disease, requiring long-term renal replacement therapy in the form of hemodialysis. As a life-sustaining procedure, hemodialysis enables metabolic waste removal and fluid balance regulation, yet it simultaneously exposes patients to significant physiological stress and clinical instability. Fluctuations in blood pressure, electrolyte imbalance, intradialytic hypotension, fatigue, and cardiovascular complications are commonly reported during and after dialysis sessions, placing patients at heightened risk of adverse outcomes (Zhang, Liu, & Wu, 2025; Gopal et al., 2024). Consequently, maintaining patient stability during hemodialysis has become a central indicator of care quality and patient safety in renal services.

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Within the hemodialysis setting, nurses play a pivotal role in safeguarding patient stability. Unlike other healthcare professionals who may engage episodically, nurses maintain continuous and direct contact with patients before, during, and after dialysis sessions. Clinical nursing interventions encompass systematic monitoring of vital signs, fluid and electrolyte management, early identification of complications, vascular access care, symptom management, patient education, and psychosocial support. Evidence suggests that timely and appropriate nursing interventions can prevent clinical deterioration and enhance patient outcomes during dialysis therapy (Khairallah & Al-Ashour, 2025; Arslan & Yucel, 2025). However, the effectiveness of these interventions depends heavily on their quality, consistency, and responsiveness to patient needs.

Despite the recognized importance of nursing care in hemodialysis units, the contribution of specific clinical nursing interventions to patient stability has not been sufficiently examined through analytic approaches. Existing research in hemodialysis nursing has predominantly focused on patient adherence, self-care behaviors, quality of life, and psychosocial outcomes (Lee & Cho, 2025; Jafarzadeh et al., 2025). While these aspects are undeniably important, they do not fully capture the immediate physiological and clinical stability required to ensure patient safety during dialysis procedures. Studies addressing nursing interventions often adopt descriptive designs or evaluate outcomes without quantifying the relative contribution of nursing care to clinical stability (Araújo et al., 2025).

Recent empirical studies indicate that nurse-led and evidence-based nursing interventions can improve clinical outcomes among hemodialysis patients. For instance, nurse-led coaching, targeted education, and comprehensive nursing care have been shown to enhance hemodynamic stability, symptom control, and disease management (Sanchez-Escuredo et al., 2025; Pargaien, Prakash, & Pugazhendi, 2025). Similarly, interventions grounded in nursing theories, such as comfort-based care, demonstrate positive effects on symptom severity and patient comfort during dialysis (Arslan & Yucel, 2025). Nevertheless, many of these studies employ quasi-experimental or interventional designs without systematically assessing how variations in routine clinical nursing interventions relate to patient stability under real-world service conditions.

Methodologically, the limited use of observational analytic designs and multivariate analysis has constrained the ability of previous research to isolate the contribution of nursing interventions from other influencing factors such as patient age, comorbidities, dialysis duration, and treatment modality. As a result, the specific role of clinical nursing interventions in maintaining patient stability remains underexplored and insufficiently quantified. The absence of robust analytic evidence poses challenges for the development of standardized nursing protocols and evidence-based practice guidelines in hemodialysis units (Zhang et al., 2021; Wang, Yi, & Fan, 2024).

The research gap addressed in this study lies in the scarcity of observational analytic research examining the relationship between clinical nursing interventions and patient stability among individuals undergoing maintenance hemodialysis. While studies such as “The Effect of Refined Nursing Intervention on Patients Undergoing Maintenance Hemodialysis” by Zhang et al. (2021) highlight improved outcomes following enhanced nursing care, they do not quantify the relative contribution of nursing interventions after controlling for patient characteristics. Similarly, “The Impact of Evidence-Based Nursing

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Interventions on the Health Status of Hemodialysis Patients" by Khairallah and Al-Ashour (2025) demonstrates positive health effects but does not focus specifically on clinical stability as a primary outcome. Moreover, systematic reviews by Araújo et al. (2025) emphasize the importance of nursing support yet call for more analytic studies to strengthen causal inferences.

Addressing this gap is essential to advance evidence-based nursing practice in hemodialysis care. Understanding the extent to which clinical nursing interventions contribute to patient stability can inform staffing decisions, intervention prioritization, and the development of standardized nursing care protocols. From a practical perspective, empirical evidence on nursing contributions strengthens professional recognition of nurses' roles in patient safety and clinical outcomes. Academically, such evidence enriches the body of nursing science by linking routine clinical interventions to measurable physiological outcomes.

Therefore, this study aims to analyze the relationship between clinical nursing interventions and patient stability among individuals with chronic kidney disease undergoing hemodialysis. In addition, it seeks to assess the relative contribution of nursing interventions to patient stability after accounting for relevant clinical and demographic factors. By employing an observational analytic approach, this study is expected to provide empirical support for strengthening clinical nursing practice and improving the quality of hemodialysis care through evidence-based intervention strategies.

## METODOLOGI

### Research Design

This study employed a quantitative approach with an observational analytic design to examine the relationship between clinical nursing interventions and patient stability among individuals with chronic kidney disease undergoing hemodialysis. A cross-sectional design was applied to measure nursing interventions and patient stability simultaneously during routine hemodialysis sessions. This design was selected to capture real-world clinical practices and to allow analysis of associations between variables without manipulating the care environment. The study also considered the analytic suitability of regression techniques to estimate the relative contribution of nursing interventions to patient stability.

### Population and Sample

The study population consisted of patients diagnosed with chronic kidney disease who were undergoing maintenance hemodialysis at a dialysis unit. Participants were selected based on inclusion criteria that included adult patients receiving regular hemodialysis treatment and being clinically stable at the time of data collection. Patients with acute complications requiring emergency intervention were excluded. The sample was determined using a sampling technique appropriate to the hemodialysis service context, ensuring sufficient statistical power for correlation and regression analyses. The final sample represented a range of patient characteristics, including age, duration of hemodialysis, and clinical condition.

### Research Instruments

Data were collected using structured observation sheets and clinical assessment forms. Clinical nursing interventions were measured through an observation checklist covering key nursing activities, including monitoring of vital signs, fluid management, vascular access care, patient education, and immediate response to intradialytic complications. Patient stability was assessed using physiological and

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clinical indicators such as blood pressure stability, heart rate consistency, occurrence of intradialytic symptoms, and overall clinical response during hemodialysis sessions. The instruments were developed based on clinical standards and prior nursing literature to ensure consistency and accuracy of measurement.

## RESULTS AND DISCUSSION

### Characteristics of Respondents

This study involved 120 patients with chronic kidney disease undergoing maintenance hemodialysis. Respondent characteristics were analyzed to provide clinical context and to ensure the representativeness of the sample. Variables examined included age, gender, duration of hemodialysis, and presence of comorbid conditions.

**Table 1. Characteristics of Respondents**

| Characteristics | Mean / n | Percentage (%) |
|---|---|---|
| Mean age (years) | 52.6 ± 11.4 | – |
| Male | 68 | 56.7 |
| Female | 52 | 43.3 |
| Duration of hemodialysis ≥ 2 years | 73 | 60.8 |
| Presence of ≥1 comorbidity | 81 | 67.5 |

The majority of respondents were middle-aged adults with long-term exposure to hemodialysis therapy. More than half had been undergoing hemodialysis for two years or longer, and a substantial proportion had comorbid conditions. These characteristics indicate a clinically relevant population in which patient stability is a critical outcome of nursing care.

### Distribution of Clinical Nursing Interventions

Clinical nursing interventions were assessed based on observed frequency and completeness during hemodialysis sessions. Interventions were categorized into low, moderate, and high levels based on adherence to clinical nursing standards.

**Table 2. Distribution of Clinical Nursing Interventions**

| Level of Nursing Intervention | n | Percentage (%) |
|---|---|---|
| Low | 22 | 18.3 |
| Moderate | 41 | 34.2 |
| High | 57 | 47.5 |

Nearly half of the patients received a high level of clinical nursing interventions, indicating strong nursing involvement during hemodialysis. However, a notable proportion of patients experienced only low to moderate intervention levels, suggesting variability in the intensity and consistency of nursing care.

### Patient Stability During Hemodialysis

Patient stability was evaluated using a composite score derived from physiological and clinical indicators observed during dialysis sessions. Higher scores reflected greater hemodynamic and clinical stability.

**Table 3. Patient Stability Scores**

| Stability Level | n | Percentage (%) |
|---|---|---|
| Low stability | 29 | 24.2 |
| Moderate stability | 38 | 31.7 |
| High stability | 53 | 44.1 |

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Most patients demonstrated moderate to high levels of clinical stability during hemodialysis. Nonetheless, approximately one-quarter of patients experienced low stability, highlighting the ongoing risk of intradialytic complications and the importance of targeted nursing interventions.

**Correlation Between Nursing Interventions and Patient Stability**

Pearson correlation analysis was conducted to examine the relationship between clinical nursing interventions and patient stability.

**Table 4. Correlation Between Nursing Interventions and Patient Stability**

| Variables | r | p-value |
|---|---|---|
| Nursing interventions – Patient stability | 0.62 | < 0.001 |

A strong positive correlation was observed between the level of clinical nursing interventions and patient stability. This finding indicates that higher intensity and quality of nursing care are associated with improved physiological and clinical stability during hemodialysis.

**Contribution of Nursing Interventions to Patient Stability**

Multiple linear regression analysis was performed to assess the contribution of clinical nursing interventions to patient stability after controlling for age, duration of hemodialysis, and comorbid conditions.

**Table 5. Regression Analysis of Factors Affecting Patient Stability**

| Predictor | β | t | p-value |
|---|---|---|---|
| Clinical nursing interventions | 0.54 | 7.91 | < 0.001 |
| Age | -0.12 | -1.48 | 0.142 |
| Duration of hemodialysis | -0.09 | -1.11 | 0.269 |
| Comorbidities | -0.15 | -1.89 | 0.061 |

Model $R^2 = 0.48$

Clinical nursing interventions emerged as the strongest and most significant predictor of patient stability during hemodialysis. The model explains 48% of the variance in patient stability, indicating a substantial contribution of nursing care to clinical outcomes. Other variables did not show statistically significant effects, reinforcing the central role of nursing interventions in maintaining patient stability.

Overall, the findings demonstrate that clinical nursing interventions are significantly associated with and contribute meaningfully to patient stability among chronic kidney disease patients undergoing hemodialysis. Patients receiving higher levels of nursing interventions consistently showed better physiological and clinical stability, both in bivariate and multivariate analyses. These results provide strong empirical support for the importance of intensive, evidence-based nursing care in hemodialysis settings.

**Discussion**

**The Contribution of Clinical Nursing Interventions to Patient Stability in Hemodialysis Care**

The results of this study provide strong empirical evidence that clinical nursing interventions significantly contribute to the stability of patients with chronic kidney disease undergoing hemodialysis. The significant correlation and regression findings indicate that higher intensity and quality of nursing interventions are associated with improved physiological and clinical stability during dialysis sessions.

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These findings reinforce the position of nurses as key agents in maintaining patient safety and clinical equilibrium in high-risk renal care environments (Khairallah & Al-Ashour, 2025; Arooj et al., 2025).

Hemodialysis is a complex and invasive procedure that exposes patients to acute complications such as hypotension, electrolyte imbalance, fluid overload, and cardiovascular instability. Within this context, nursing interventions, including continuous monitoring of vital signs, fluid management, vascular access surveillance, and timely response to complications, serve as essential mechanisms for preventing clinical deterioration. The positive association identified in this study aligns with prior evidence showing that evidence-based and nurse-led interventions improve hemodynamic stability and reduce intradialytic complications among hemodialysis patients (Nurliza et al., 2025; Zhang et al., 2021).

The regression analysis further demonstrates that clinical nursing interventions remain a significant predictor of patient stability even after controlling for patient characteristics. This suggests that nursing care has an independent and substantial contribution beyond demographic or disease-related factors. Similar findings have been reported by Shu et al. (2025), who showed that structured nursing interventions based on health ecology and holistic care models significantly improved clinical outcomes in maintenance hemodialysis patients. This reinforces the view that high-quality nursing care can mitigate inherent clinical risks associated with long-term dialysis treatment.

Variations in the level of nursing interventions observed in this study indicate that not all patients receive the same intensity or quality of care. Such variability may be influenced by staffing levels, nurse workload, institutional protocols, or differences in clinical expertise. Previous studies have highlighted that inconsistent nursing practices can lead to unequal patient outcomes and increased risk of instability during dialysis (Zhao et al., 2025; Sanchez-Escuredo et al., 2025). Therefore, standardization of nursing interventions through clinical guidelines and competency-based training is essential to ensure consistent patient stability.

From a professional nursing perspective, these findings underscore the importance of strengthening clinical competencies in hemodialysis care. Interventions such as nurse-led education, symptom monitoring, and individualized care planning have been shown to enhance patient activation and self-management, which indirectly supports physiological stability (Gopal et al., 2024; Lee & Cho, 2025). Moreover, integrating comfort-based and patient-centered nursing frameworks can further improve both clinical stability and patient experience during hemodialysis (Arslan & Yucel, 2025).

Despite its contributions, this study has limitations that should be considered. The cross-sectional design restricts causal interpretation, as nursing interventions and patient stability were assessed at a single point in time. Longitudinal studies or cohort designs would provide stronger evidence regarding temporal and causal relationships (Sugiyono, 2019). Additionally, reliance on observational instruments may introduce measurement bias, as the complexity of nursing care may not be fully captured through structured observation alone. Mixed-method approaches could offer deeper insights into contextual and experiential aspects of nursing interventions (Araújo et al., 2025).

Overall, this study confirms that clinical nursing interventions are a critical determinant of patient stability in hemodialysis care. The findings support existing evidence that strengthening nursing practice through evidence-based interventions, standardized protocols, and continuous professional development is essential for improving patient outcomes and ensuring safety in chronic kidney disease management.

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## CONCLUSIONS

This study concludes that clinical nursing interventions play a significant and meaningful role in maintaining the stability of patients with chronic kidney disease undergoing hemodialysis. The findings demonstrate a positive and statistically significant relationship between the intensity and quality of nursing interventions and patient stability, indicating that comprehensive nursing care contributes directly to improved physiological and clinical outcomes during hemodialysis. These results confirm that nursing interventions are not merely supportive actions but constitute a core component of patient safety and stability in renal care settings.

From a practical and clinical perspective, the results highlight the importance of strengthening evidence-based nursing practices in hemodialysis units. Standardized monitoring of vital signs, proactive management of fluid balance, timely identification of complications, and continuous patient education should be emphasized as integral elements of nursing care. Enhancing nurses' clinical competencies through training and adherence to standardized care protocols may help reduce variability in practice and ensure more consistent patient stability across different clinical settings.

Despite its contributions, this study has several limitations. The use of a cross-sectional design limits the ability to establish causal relationships between nursing interventions and patient stability. In addition, the measurement of nursing interventions relied on observational instruments, which may not fully capture the complexity and contextual nuances of clinical nursing care. Future research is recommended to employ longitudinal or cohort designs and incorporate mixed-method approaches to further explore how specific nursing interventions influence patient stability over time and across diverse hemodialysis settings.

## REFERENCES

Araújo, H., Marques, E., Lourenço, I., Bonifácio, C., & Gomes, F. (2025). Nursing Interventions to Support Family Caregivers of Patients on Haemodialysis: A Mixed-Methods Systematic Review.. Journal of advanced nursing. https://doi.org/10.1111/jan.70297.

Arooj, H., Aman, M., Hashmi, M., Nasir, Z., Zahid, M., Abbas, J., Amjad, N., Maryam, S., & Farhan, K. (2025). The impact of nurse-led care in chronic kidney disease management: a systematic review and meta-analysis. BMC Nursing, 24. https://doi.org/10.1186/s12912-025-02829-z.

Arslan, G., & Yucel, S. (2025). The Effect of Nursing Care Based on Kolcaba's Comfort Theory on Symptom Severity and Comfort of Hemodialysis Patients.. Hemodialysis international. International Symposium on Home Hemodialysis. https://doi.org/10.1111/hdi.70009.

Cai, S., Tao, H., Li, C., Du, Z., Liu, S., Tan, Q., Zhou, H., Ji, N., Wang, A., Zhou, L., Zhao, Y., Li, Y., & Fu, X. (2025). Latent Profile Analysis and Influencing Factors of Learned Helplessness in Maintenance Hemodialysis Patients: A Cross-sectional Study.. Asian nursing research. https://doi.org/10.1016/j.anr.2025.07.004.

Gopal, T., Chen, S., Weinhandl, E., & Hussein, W. (2024). Associations of Patient Activation with Outcomes among Patients on Chronic Hemodialysis: A Retrospective, Longitudinal, Observational Study. Kidney360, 5, 1662 - 1668. https://doi.org/10.34067/kid.0000000591.

Jafarzadeh, M., Adineh, M., Molavynejad, S., & Ghanbari, S. (2025). The relationship between illness perception and general self-efficacy in hemodialysis patients: a cross-sectional study in south-western Iran. BMC Nephrology, 26. https://doi.org/10.1186/s12882-025-04426-3.

Journal of Public Health Indonesian
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https://nawalaeducation.com/index.php/JHH

Khairallah, H., & Al-Ashour, I. (2025). Impact of evidence-based nursing interventions on the health status of hemodialysis patients: a quasi-experimental study. Anaesthesia, Pain & Intensive Care. https://doi.org/10.35975/apic.v29i6.2837.

Lee, H., & Cho, M. (2025). Effects of Shared Decision-Making, Health Literacy, and Self-Care Knowledge on Self-Care Behavior Among Hemodialysis Patients in Korea: A Cross-Sectional Survey. Healthcare, 13. https://doi.org/10.3390/healthcare13020175.

Nurliza, M., Husna, C., & , M. (2025). The Effectiveness of Foot and Back Massage to Stabilize Hemodynamics in Patients Undergoing Hemodialysis: A Quasy Experiment. International Journal of Nursing Education. https://doi.org/10.37506/cwpz4m44.

Pargaien, M., Prakash, K., & Pugazhendi, S. (2025). EFFECT OF COMPREHENSIVE NURSING INTERVENTION ON SELF-CARE PRACTICES OF PATIENTS UNDERGOING HEMODIALYSIS. International Journal of Advanced Research. https://doi.org/10.21474/ijar01/20393.

Qu, X., & Shen, P. (2023). Investigating polymorphisms related to chronic kidney disease and the effect of health and nursing education on self-management ability and quality of life in hemodialysis patients.. Cellular and molecular biology, 69 1, 25-29 . https://doi.org/10.14715/cmb/2022.69.1.5.

Sanchez-Escuredo, A., Yeung, K., Arustei, D., d'Gama, C., Faratro, R., Magtoto, E., Renganathan, K., & Chan, C. (2025). The Effects of Nurse-Led Coaching on Discordant Home Hemodialysis Patients. Hemodialysis International, 29, 513 - 518. https://doi.org/10.1111/hdi.13259.

Shu, P., Wang, X., Wen, Z., Wang, S., Wei, X., & Xu, F. (2025). Impact of nursing interventions based on the health ecology model on quality of life in maintenance hemodialysis patients. BMC Nursing, 24. https://doi.org/10.1186/s12912-025-03429-7.

Sugiyono. 2019. Metode Penelitian & Pengembangan. Alfabeta

Tutur, İ., & Bicer, E. (2025). The Effect of Nurse-Led Telephone Patient Education and Counseling on Disease Management, Quality of Life, and Self-Care Behaviors in Hemodialysis Patients.. Worldviews on evidence-based nursing, 22 6, e70074 . https://doi.org/10.1111/wvn.70074.

Wang, G., Yi, X., & Fan, H. (2024). Care preparedness of family caregivers of maintenance hemodialysis patients: a cross-sectional study. Scientific Reports, 14. https://doi.org/10.1038/s41598-024-69502-4.

Yu, X., Li, Y., & Zhang, X. (2025). Impact of targeted nursing care and nutritional support on clinical outcomes in diabetic nephropathy patients undergoing maintenance hemodialysis. Brazilian Journal of Medical and Biological Research, 58. https://doi.org/10.1590/1414-431x2025e14772.

Zhang, H., Liu, M., & Wu, J. (2025). Advanced hemodialysis systems: Assessing inflammatory biomarkers, renal analytics, and metabolic stability in elderly patients with chronic kidney disease. Technology and Health Care, 33, 2177 - 2183. https://doi.org/10.1177/09287329251332413.

Zhang, Q., Wang, S., Zhang, Y., & Meng, F. (2021). The effect of refined nursing intervention on patients undergoing maintenance hemodialysis in the hemodialysis center during the COVID-19 epidemic. BMC Nursing, 20. https://doi.org/10.1186/s12912-021-00584-5.

Zhao, W., Zhao, W., & Sun, X. (2025). Impact of Nurse-Led Cardiovascular Risk Assessment and Management Program on 1-Year Outcomes in Patients on Hemodialysis Post Percutaneous Coronary Intervention.. The Journal of cardiovascular nursing. https://doi.org/10.1097/jcn.0000000000001234.