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The Relationship Between Fluid Restriction Compliance and Hypervolemia in Chronic Kidney Failure Patients Undergoing Hemodialysis at RSD Gunung Jati Cirebon City

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ABSTRACT

Background & Objective: Chronic kidney disease (CKD) leads to progressive loss of renal function requiring hemodialysis as a substitute therapy. Compliance with fluid restriction is crucial to prevent fluid overload (hypervolemia) which can cause complications such as pulmonary edema and hypertension. This study aims to analyze the relationship between fluid restriction compliance and hypervolemia occurrence in CKD patients undergoing hemodialysis at RSD Gunung Jati Cirebon. **Method:** A descriptive correlational study with a cross-sectional approach was conducted on 98 CKD patients selected by purposive sampling. Data on fluid restriction compliance were collected using a validated questionnaire, while hypervolemia status was assessed by observation and body weight measurement. Data analysis used Spearman Rank correlation. **Result:** Among respondents, 63.3% were compliant with fluid restriction and 36.7% were non-compliant. Hypervolemia levels showed 40.8% mild, 28.6% moderate, and 30.6% severe. Statistical analysis found a significant negative correlation between fluid restriction compliance and hypervolemia occurrence (p=0.000; r=-0.756). **Conclusion:** There is a significant relationship between compliance with fluid restriction and hypervolemia among CKD patients undergoing hemodialysis. Increasing patient compliance is important to prevent complications. More specific and targeted treatment.

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Introduction

Chronic Kidney Disease (CKD) is one of the leading causes of morbidity and mortality worldwide and is marked by progressive, irreversible kidney damage that affects the body's ability to maintain fluid, electrolyte, and metabolic balance. According to Messerer et al., (2020), approximately 10% of the world's population suffers from CKD, and this figure continues to grow each year, increasing the burden on health systems, especially in developing countries like Indonesia (Kartini et al., 2018). The main treatment option for end-stage CKD is hemodialysis, which helps to replace lost kidney function but requires strict adherence to dietary and fluid restrictions to prevent complications (Beerendrakumar et al., 2018).

One of the most common and dangerous complications among patients undergoing hemodialysis is fluid overload or hypervolemia (Liyanage et al., 2022). When patients fail to comply with fluid intake restrictions, excessive fluid accumulates in the body, leading to severe consequences such as pulmonary edema, hypertension, and heart failure (Kaplan & Karadağ, 2022). Previous studies have shown that between 10% and 60% of hemodialysis patients do not fully comply with recommended fluid restrictions, leading to increased risks of complications (Almutary & Tayyib, 2021).

In Indonesia, CKD remains a significant public health issue. The Basic Health Research (Riskesdas) reported that approximately 713,783 people, or 0.83% of the population, are living with CKD (Kemenkes, 2018). In West Java, where Cirebon is located, the prevalence is among the highest nationwide. Local hospital records from RSD Gunung Jati Cirebon indicate a consistent increase in the number of patients receiving hemodialysis, rising from 124 patients in 2021 to 173 in 2022. This upward trend highlights the growing need for effective management strategies that include patient education and support to ensure compliance with fluid restrictions.

The importance of fluid restriction adherence cannot be underestimated because it directly influences patient outcomes, quality of life, and survival rates (Canaud et al., 2019). Patients who do not manage their fluid intake properly are at risk of sudden weight gain, shortness of breath, increased blood pressure, and hospitalization due to fluid overload complications (Perdana & Yen, 2021). Therefore, nurses and healthcare providers must monitor and educate patients consistently to improve compliance levels.

Research has demonstrated that improving patient knowledge about the consequences of non-compliance can significantly affect adherence behaviors. Educational interventions, family involvement, and regular monitoring are effective strategies to minimize fluid overload risks. Additionally, understanding the local context, including cultural factors and socioeconomic status, is vital in designing appropriate interventions.

Objective

This study aims to explore and analyze the relationship between fluid restriction compliance and the occurrence of hypervolemia among CKD patients undergoing hemodialysis at RSD Gunung Jati Cirebon. The findings of this research are expected to provide evidence-based recommendations for nurses, caregivers, and policymakers to develop more effective patient education and monitoring programs that can reduce the incidence of fluid overload and improve patient outcomes.

Method

This study used a descriptive correlational design with a cross-sectional approach conducted at RSD Gunung Jati Cirebon. The study population included all patients diagnosed with chronic kidney disease (CKD) undergoing routine hemodialysis at the hospital. The inclusion criteria were patients aged 18 years and older, receiving hemodialysis at least twice a week for the last three months, willing to participate, and able to communicate effectively. The total sample of 98 respondents was selected using purposive sampling.

Data collection instruments included a validated fluid restriction compliance questionnaire and an observation checklist to measure hypervolemia based on clinical signs and interdialytic weight gain. Patients' dry weight and actual weight were recorded before and after dialysis sessions to assess fluid accumulation. The questionnaire measured adherence to daily fluid intake limits, frequency of exceeding recommended volumes, and knowledge of fluid restriction benefits.

Results

TABLE 1. Fluid Restriction Compliance

Categoric	Frequency (n)	Percentage (%)
Compliant	62	63.3%
Non-compliant	36	36.7%
Total	98	100%

Table 1 shows the distribution of fluid restriction compliance among the 98 respondents. 62 patients (63.3%) were classified as compliant, while 36 patients (36.7%) were non-compliant.

TABLE 2. Hypervolemia Classification

Categoric	Frequency (n)	Percentage (%)
Mild	40	40.8%
Moderate	28	28.6%
Severe	30	30.6%
Total	98	100%

Table 2 displays the classification of hypervolemia levels. 40 patients (40.8%) experienced mild hypervolemia, 28 patients (28.6%) moderate, and 30 patients (30.6%) severe hypervolemia.

TABLE 3. Correlation Analysis

Categoric	p-value	Correlation Coefficient (r)
Spearman Rank Test	0.000	-0.756

Table 3 presents the correlation analysis. The Spearman Rank test showed a significant negative correlation between fluid restriction compliance and hypervolemia occurrence (p=0.000; r=-0.756).

Discussion

The results of this study show that most patients undergoing hemodialysis at RSD Gunung Jati Cirebon in 2025 demonstrated good compliance with fluid restrictions (63.3%), while a significant minority (36.7%) did not. This compliance rate aligns with other studies that report varying levels of adherence among hemodialysis patients, influenced by factors such as knowledge, motivation, family support, and educational interventions (Mailani et al., 2023). The importance of adherence to fluid

restriction is critical because excess fluid intake leads directly to hypervolemia, which can worsen patient outcomes.

Hypervolemia, as observed in this study, was found at different levels: mild (40.8%), moderate (28.6%), and severe (30.6%). These findings suggest that despite relatively high compliance, a considerable number of patients still experience significant fluid overload (Masoud et al., 2023). This could be due to challenges in maintaining strict adherence daily, lack of monitoring at home, or inadequate understanding of fluid management principles.

The significant negative correlation (p=0.000; r=-0.756) indicates that the more compliant patients are with fluid restrictions, the lower the severity of hypervolemia. This is consistent with previous findings that demonstrate fluid intake beyond recommended limits can result in interdialytic weight gain, increased blood pressure, pulmonary edema, and cardiovascular stress (Mailani et al., 2023).

Factors influencing compliance include patient education, family involvement, and effective communication with healthcare providers (Hanifah & N Sukesi, 2024). Some patients may not fully understand the consequences of non-compliance or may struggle with dietary adjustments, especially when cultural eating habits include high-sodium foods, which can increase thirst (Messerer et al., 2020). Another factor is psychological readiness. Patients undergoing long-term often experience emotional fatigue, which can impact self-discipline in managing fluid intake (Pio et al., 2022). Support systems, including counseling and peer support groups, have been shown to improve patient adherence.

Nurses play a crucial role in educating patients about daily fluid intake limits, recognizing early signs of fluid overload, and encouraging behavioral changes (Sotoudeh et al., 2019). Providing clear guidelines, practical tips for limiting thirst, and involving family members in monitoring intake are recommended strategies (Drakenberg et al., 2023).

The presence of severe hypervolemia in 30.6% of respondents highlights the need for continuous monitoring and reinforcement of patient education. Implementing individualized education plans, using reminder tools, and scheduling routine follow-up consultations can help patients maintain good compliance (Mahyuvi & Hasina, 2021). The study's findings contribute valuable evidence for nursing practice and hospital policy. Integrating structured education sessions, follow-up phone calls, and regular weight checks could reduce the prevalence of hypervolemia. Future research should explore interventions that address cultural barriers and psychological factors influencing compliance.

Conclusion

This study concludes that there is a significant negative relationship between fluid restriction compliance and the occurrence of hypervolemia in chronic kidney disease patients undergoing hemodialysis at RSD Gunung Jati Cirebon. Patients who adhere to fluid intake restrictions are less likely to experience severe fluid overload. These findings emphasize the crucial role of nursing care in providing continuous education, motivation, and monitoring to support patients in managing their fluid intake. It is recommended that health professionals implement comprehensive educational programs, involve families in patient care, and design follow-up strategies to maintain high compliance levels. Future research should examine the

effectiveness of tailored interventions to further improve patient outcomes and quality of life.

References

Almutary, H., & Tayyib, N. (2021). Evaluating self-efficacy among patients undergoing dialysis therapy. *Nursing Reports*, *11*(1), 195–201. https://doi.org/10.3390/NURSREP11010019

Beerendrakumar, N., Ramamoorthy, L., & Haridasan, S. (2018). Dietary and Fluid Regime Adherence in Chronic Kidney Disease Patients. *Journal of Caring Sciences*, *7*(1), 17–20. https://doi.org/10.15171/JCS.2018.003

Canaud, B., Chazot, C., Koomans, J., & Collins, A. (2019). Fluid and hemodynamic management in hemodialysis patients: challenges and opportunities. *Brazilian Journal of Nephrology*, *41*(4), 550–559. https://doi.org/10.1590/2175-8239-JBN-2019-0135

Drakenberg, A., Sluys, K. P., Ericsson, E., & Sundqvist, A. S. (2023). The Family Involvement in Care Questionnaire—An instrument measuring family involvement in inpatient care. *PLOS ONE*, *18*(8), e0285562. https://doi.org/10.1371/JOURNAL.PONE.0285562

Hanifah, S., & N Sukesi. (2024). The Effect of Cognitive Behavioral Therapy on Knowledge of Fluid Intake Restrictions in Hemodialysis Patients. *International Journal of Contemporary Sciences (IJCS)*, *2*(1), 13–26. https://doi.org/10.55927/ijcs.v2i1.11880

Kaplan, A., & Karadağ, S. (2022). The determination of adherence to fluid control and symptoms of patients undergoing hemodialysis. *African Health Sciences*, *22*(3), 359. https://doi.org/10.4314/AHS.V22I3.38

Kartini, D., Siswiandari, M. K., Wibisana, G., Yulian, E. D., Kurnia, A., Panigoro, S. S., Albar, A. Z., & Ramli, M. (2018). Craniofacial Brown Tumor in Patients with Secondary Hyperparathyroidism to Chronic Renal Failure: Report of Two Cases in Cipto Mangunkusumo Hospital. *Case Reports in Oncological Medicine*, *2018*, 1–7. https://doi.org/10.1155/2018/1801652

Kemenkes, R. I. (2018). *riskesdas 2018*. https://www.google.com/search?q=riskesdas+2018&oq=riskesdas&aqs=chrome.1.69i57j0i512j0i131i433i512j0i512l7.6135j0j15&sourceid=chrome&ie=UTF-8

Liyanage, T., Toyama, T., Hockham, C., Ninomiya, T., Perkovic, V., Woodward, M., Fukagawa, M., Matsushita, K., Praditpornsilpa, K., Hooi, L. S., Iseki, K., Lin, M. Y., Stirnadel-Farrant, H. A., Jha, V., & Jun, M. (2022). Prevalence of chronic kidney disease in Asia: A systematic review and analysis. *BMJ Global Health*, *7*(1). https://doi.org/10.1136/bmjgh-2021-007525

Mahyuvi, T., & Hasina, S. N. (2021). Improving the Compliance of Fluid Diet of Patients with Chronic Kidney Failure with Family Support-Based Health Education. *Journal for Quality in Public Health*, *5*(1), 348–353. https://doi.org/10.30994/jqph.v5i1.277

Mailani, F., Mahathir, M., & Rahma Yuni, A. (2023). Self-Efficacy and Compliance Fluid Intake Restrictions in Chronic Kidney Disease Patients Undergoing

Hemodialysis: A Cross-Sectional Study. *Jurnal Keperawatan Komprehensif*, *9*(3). https://doi.org/10.33755/jkk

Masoud, S. A.-E., Abd-Elaziz, S. H., Mohamed, S. K., & Abdo, O. I. (2023). Self-efficacy and adherence to medication and fluid restriction among patients undergoing hemodialysis. *Egyptian Nursing Journal*, *20*(1), 50–56. https://doi.org/10.4103/enj.enj_4_23

Messerer, D. A. C., Halbgebauer, R., Nilsson, B., Pavenstädt, H., Radermacher, P., & Huber-Lang, M. (2020). Immunopathophysiology of trauma-related acute kidney injury. *Nature Reviews Nephrology*, *17*(2), 91–111. https://doi.org/10.1038/s41581-020-00344-9

Perdana, M., & Yen, M. (2021). *Factors Associated With Adherence to Fluid Restriction in Patients Undergoing Hemodialysis in Indonesia*. http://journals.lww.com/jnr-twna

Pio, T. M. T., Prihanto, J. B., Jahan, Y., Hirose, N., Kazawa, K., & Moriyama, M. (2022). Assessing Burden, Anxiety, Depression, and Quality of Life among Caregivers of Hemodialysis Patients in Indonesia: A Cross-Sectional Study. *International Journal of Environmental Research and Public Health*, *19*(8), 4544. https://doi.org/10.3390/ijerph19084544

Sotoudeh, R., Pahlavanzadeh, S., & Alavi, M. (2019). The Effect of a Family-Based Training Program on the Care Burden of Family Caregivers of Patients Undergoing Hemodialysis. *Iranian Journal of Nursing and Midwifery Research*, *24*(2), 144–150. https://doi.org/10.4103/ijnmr.IJNMR_93_18