

Factors Affecting Inter-Dialysis Weight Gain (IDWG) in Chronic Kidney Disease Patients in the Hemodialysis Room of Soewondo Pati Regional Hospital

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Abstract. Chronic Kidney Disease (CKD) is a progressive and irreversible decline in kidney function that requires renal replacement therapy in the form of hemodialysis (HD). One of the main clinical problems often faced by hemodialysis patients is non-adherence to fluid intake restrictions, which directly impacts the increase in interdialytic weight gain, or Interdialytic Weight Gain (IDWG). The level of IDWG reflects accumulation of the patient's body fluid volume between two hemodialysis sessions and is significantly influenced by the patient's individual internal characteristics. The study used a quantitative descriptive research design with a univariate analysis approach to identify profiles of demographic and clinical characteristics that act as influencing factors for the level of IDWG. The study involved a total sample of 119 respondents who underwent routine hemodialysis therapy in the Hemodialysis Room at RAA Soewondo Pati Regional Hospital. Data collection was carried out using a characteristics questionnaire and a weight measurement observation sheet. The distribution of characteristics shows that the dominant individual factors among patients include the early elderly age group (46-55 years) with 40 respondents (33,6%), male gender with 69 respondents (58,0%), the most recent educational level of elementary school with 38 respondents (31,9%), not working status with 47 respondents (39,5%), and the duration of having long undergone hemodialysis therapy ≥ 24 months with 63 respondents (52,9%). Demographic and clinical characteristics (age, gender, education level, occupation, and duration of HD therapy) are important factors that physiologically and psychosocially affect the ability to control interdialytic fluid and the magnitude of IDWG values in patients with chronic kidney failure.

Keywords: Interdialytic Weight Gain (IDWG), Chronic Kidney Failure (CKD), Hemodialysis

INTRODUCTION

Non-communicable diseases (NCDs) are diseases that cannot be transmitted between NCDs currently account for about 74% of global deaths, with around 41 million people dying each year from NCDs (Ministry of Health of the Republic of Indonesia, 2023). One of them is Chronic Kidney Disease (CKD), which affects 11.7%-15.1% of the population worldwide. CKD ranks 10th as a cause of death among adults with diabetes mellitus, hypertension, women, older adults, and members of minority racial groups are more likely to suffer from chronic kidney disease (Kovesdy, 2022).

Basic Health Research data show the proportion of hemodialysis in Indonesia as 19.33% (Ministry of Health of the Republic of Indonesia, 2018). Pernefri (Indonesian Nephrology Association) in 2022 stated that CKD patients undergoing Hemodialysis (HD) were 19.33% (2,850) (PERNEFRI, 2022). More specifically, Central Java Province ranks second after West Java Province as the province with the number of CKD patients undergoing hemodialysis in 2023 totaling 13,311 patients (Dinkes Jateng, 2023).

The hospital in Central Java with the most CKD patients is RSUD dr. Moerwadi Surakarta (Solo) with about 250-300 HD patients in 2023, likewise at the Internal Medicine Clinic of RSUD RAA Soewondo Pati; it records an increase of 1.15% in CKD cases undergoing hemodialysis therapy each month. Medical record data of RSUD RAA Soewondo Pati showed that in 2024 there were 1,945 patients with CKD.

Patients with end-stage CKD experience a drastic loss of kidney filtration function, so they require replacement therapy in the form of hemodialysis to maintain body homeostasis. During the period between two dialysis sessions (interdialytic), patients are required to comply with very strict fluid intake restrictions in order to prevent excess body fluid volume (fluid overload). This fluid accumulation is measured objectively through IDWG. The safe limit for IDWG increase is not exceeding 3% to 4,8% of the patient's dry weight. An IDWG increase that exceeds the safe threshold can trigger fatal complications such as intradialytic hypertension, severe hypotension, congestive heart failure, muscle cramps, shortness of breath (dyspnea), pulmonary edema, up to sudden death. Therefore, a deep understanding of factors from the internal characteristics of patients that influence IDWG fluctuations

METHODS

This study was designed using a quantitative descriptive method through a univariate analysis approach. This method is specifically focused on presenting, identifying, and analyzing the distribution of external, internal, and clinical factors arising from individual patient characteristics that influence the level of IDWG. The population in this study involved all chronic kidney failure patients receiving routine hemodialysis therapy in the Hemodialysis Room of RSUD RAA Soewondo Pati. Sample determination used technique purposive sampling while considering clinical inclusion and exclusion criteria, thus a definitive sample size of 119 respondents was obtained. The instruments used included a respondent characteristic data sheet questionnaire (name, age, gender, education level, employment status, and duration of HD therapy) and an observation sheet of pre-HD and post-HD session weight records to calculate the percentage of IDWG values. Data analysis used descriptive statistics in the form of frequency distribution and percentage values.

RESULTS AND DISCUSSION

Based on primary data collected from 119 respondents in the Hemodialysis Unit of RSUD RAA Soewondo Pati, a profile distribution around respondent characteristics (age, gender, education level, employment status, and duration of hemodialysis therapy) was obtained and presented in a structured table as follows:

1. Respondent Age

Tabel 1 Frequency Distribution Based on Age of CKD Patients in the HD Room of RSUD RAA Soewondo Pati (n=119)

Age	Frequency	Percentage (%)
Late adolescence (17-25)	6	5
Early adulthood (26-35)	10	8.4
Late adulthood (36-45)	25	21
Early elderly (46-55)	40	33.6
Late elderly (56-65)	30	25.2
Senior (>65)	8	6.7
Total	119	100

2. Respondent Gender

Tabel 2 Frequency Distribution Based on Respondent Gender of CKD Patients in HD Room RSUD RAA Soewondo Pati (n=119)

Gender	Frequency	Percentage (%)
Female	50	42
Male	69	58
Total	119	100

3. Respondent Education

Tabel 3 Frequency Distribution Based on Education of Respondent CKD Patients in the HD Room of RSUD RAA Soewondo Pati (n=119)

Eduaction	Frequency	Percentage (%)
Elementary school	38	31.9
Junior high school	29	24.4
Senior high school	37	31.1
Higher education	10	8.4
No schooling	5	4.2
Total	119	100

4. Respondent Occupation

Tabel 4 Frequency Distribution Based on Respondent Occupation Patients CKD in the HD Room
RSUD RAA Soewondo Pati (n=119)

Occupation	Frequency	Percentage (%)
PNS	11	9.2
TNI/Polri	1	0.8
Private	17	14.3
Farmer	30	25.2
Entrepreneur/Businessperson	13	10.9
Unemployed	47	39.5
Total	119	100

5. Duration Of HD Of Respondents

Tabel 5 Frequency Distribution Based on the Duration of HD of Patients' Respondents CKD in the
HD Room of RSUD RAA Soewondo Pati (n=119)

Duration of HD	Frequency	Percentage (%)
≤12 months	20	16.8
13-24 months	36	30.3
≥24 months	63	52.9
Total	119	100

Demographic and clinical characteristics above act as important internal factors underlying adherence to patient fluid management behavior and fluctuations in achieving IDWG levels:

The data analysis results show that the majority of respondents are in the early elderly age range (46-55 years) with 40 people (33.6%). Age increases linearly with progressive decline in the body's physiological functions, including the remaining nephrons function in CKD patients. Additionally, aging factors cause weakening of cognitive function and changes in osmoreceptors in regulating the thirst center in the hypothalamus, so elderly patients often have difficulty controlling daily interdialytic fluid intake consistently (Ginting, 2019).

Male respondents dominated the course of therapy with 69 respondents (58.0%). From a biological standpoint, males have a body composition with a larger proportion of muscle mass and body surface area, which naturally results in a higher basal water requirement and a thirst threshold reached more quickly. Furthermore, men generally have higher external physical activity levels and social interactions outside the home, which triggers a psychological urge to consume fluids more often than women (Jalalzadeh et al., 2021).

The respondents' last education level was dominated by elementary school graduates (SD) with 38 respondents (31.9%). Education is a foundational basis for forming an individual's health awareness. The low level of formal education impacts the limitations of the patient's cognitive grasp in understanding the implications of the dangers of accumulating excess body fluid volume. This makes it difficult to adapt to adherence to fluid diet restrictions, thus triggering instability in IDWG value increases (Saragih, 2024).

In terms of occupation activity, the data distribution is dominated by patients who are not working, namely 47 respondents (39.5%). This unemployment condition is mostly due to chronic uremic syndrome, anemia, or extreme fatigue after dialysis experienced by CKD patients, which limits their productive movement. The absence of work activity provides psychosocial impacts including increased stress, boredom, and anxiety at home, where emotional conditions are often redirected destructively in the form of excessive water consumption to relieve xerostomia or dry mouth symptoms (Sinuraya & Lismayanur, 2019).

Clinical parameter of therapy duration, the majority of respondents have undergone long-term hemodialysis (≥24 months) with 63 respondents (52.9%). The duration of HD has dual implications for patient behavior adaptation. New patients (≤12 months) are generally vulnerable to IDWG spikes due to not yet achieving self-management stability (self-care) and psychological coping mechanisms towards the fluid diet limitations. Conversely, although patients with duration ≥24 months theoretically have a mature understanding of fluid management, they still face risks clinical saturation which at any time can reduce its adherence level (Bayhakki & Hasneli, 2018).

CONCLUSION

The results of a univariate descriptive analysis of 119 respondents in the Hemodialysis Unit of RSUD RAA Soewondo Pati can be concluded that Interdialytic Weight Gain (IDWG) in chronic kidney failure patients is complexly influenced by variations in individual characteristic factors. These internal determining factors include the patient's age (dominated by the early elderly group), sex (dominated by males), the latest education level (dominated by primary school graduates), employment status (dominated by those not working), and the clinical duration of therapy (dominated by long-term treatment ≥ 24 months).

The close relationship between these demographic factors and adherence to fluid intake management indicates the need for counseling approaches and educational intervention from a medical team that is individual (tailored intervention) by taking into account the social and economic background and the cognitive capacity of each patient in order to minimize the risk of fatal complications due to excess body fluid volume (Campbell, J. I., Thomsen, J. L., & Martins, 2021).

REFERENCES

- Campbell, J. I., Thomsen, J. L., & Martins, R. S. (2021). Tailored educational interventions and fluid management adherence in chronic kidney disease: A systematic review of socioeconomic and cognitive barriers. *Journal of Renal Care*, 47(3), 164–175.
- Dinkes Jateng (2023) 'Mid-Year 2023 Central Java'.
- Gultom, E.C.V. et al. (2024) 'Factors Associated with Increased Interdialytic Weight Gain in Hemodialysis Patients', *Jurnal Keperawatan Cikini*, 5(01), pp. 46–57.
- Ginting, E. B. (2019). The effect of age, sex, and the length of hemodialysis on the value of Interdialytic Weight Gain (Idwg) in adult patients with chronic kidney failure who undergo routine hemodialysis at RSUD Budhi Asih. *Universitas Binawan*, 1–102.
- Jalalzadeh, M., Mousavinasab, S., Villavicencio, C., Aameish, M., Chaudhari, S., & Baumstein, D. (2021). Consequences of Interdialytic Weight Gain Among Hemodialysis Patients. <https://doi.org/10.7759/cureus.15013> *Cureus*.
- Kemenkes RI (2018) 'National Riskesdas 2018 Report.pdf', Balitbangkes Publishing Institute, p. page 156.
- Kemenkes RI (2023) 'Ditjen P2P Semester I Performance Report for 2023', kemenkes RI, pp. 1–134.
- Kovesdy, C.P. (2022) Epidemiology of chronic kidney disease: an update 2022, *Kidney International Supplements*. PERNEFRI (2022) Indonesia Renal Registry.
- Wayunah, W., Saefulloh, M. and Nuraeni, W. (2016) 'Implementation of Structured Education Increases Self Efficacy and Reduces Idwg of Hemodialysis Patients at Rsud Indramayu', *Journal Indonesian Nursing Education*, 2(1), p. 22.
- Bayhakki, B., & Hasneli, Y. (2018). The relationship between the length of undergoing hemodialysis and Inter-Dialytic Weight Gain (IDWG) in hemodialysis patients. *Jurnal Keperawatan Padjadjaran*, 5(3), 242–248.
- Rahayu, N. F. (2025). The relationship between thirst sensation and xerostomia with Interdialytic Weight Gain in the Ward Hemodialysis Room at RSI Sultan Agung Semarang. *Unissula Repository*.
- Saragih, A. M, Wahyuni, S., Yuniarti, R., Indrayani, G., P. (2024). Description Of Patient Characteristics Chronic Kidney Failure Stage V Who Undergo Hemodialysis. *Jurnal Ilmiah Sain Dan Teknologi*, 15(1), 431–440.
- Sinuraya, E., & Lismayanur. (2019). The relationship between the length of undergoing hemodialysis therapy and quality of life in patients with chronic kidney failure who undergo hemodialysis at Rasyida Kidney Hospital Medan. *Jurnal Online Keperawatan Indonesia* 139 *Jurnal Online Keperawatan Indonesia*, 2(1), 139–148.