



# Relationship between self-efficacy and interdialytic weight gain (IDWG) index in people with chronic renal failure

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## ARTICLE INFO

Hubungan antara efikasi diri dan indeks penambahan berat badan interdialytic (IDWG) pada penderita gagal ginjal kronik

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## ABSTRACT

**Background:** Weight gain due to excess fluid in patients undergoing hemodialysis leads to shortness of breath and heart failure. Self-efficacy plays an important role in a person's ability to organize and carry out the programs of action needed to cope with situations that arise.

**Purpose:** To analyze the correlation between self-efficacy and IDWG index in patients with chronic kidney disease.

**Methods:** This study was conducted on chronic kidney disease patients in the hemodialysis room of RSUD Otanaha using a correlational research design with a cross-sectional approach. A total of 60 respondents were recruited using the purposive sampling technique. Data collection was done using a self-efficacy questionnaire and an IDWG observation sheet. Data analysis using the Pearson correlation test.

**Results:** The results of this study showed a mean self-efficacy of 23.4 and a mean IDWG of 2.7. The results of the Pearson correlation test analysis yielded a p-value of 0.03 (<0.05), indicating that self-efficacy is related to IDWG scores in patients with chronic kidney disease.

**Conclusion:** It can be concluded that good self-efficacy can reduce the IDWG index, and it is recommended that this research be used as reference material and provide nursing interventions in the form of education on the application of self-efficacy.

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## 1. Background

Chronic kidney failure is a health problem that is increasing in both developed and developing countries. Indonesia is one of the countries facing this problem. Chronic kidney failure cannot be cured; hemodialysis therapy is only a therapy to replace kidney function. Complications in patients with chronic renal failure undergoing hemodialysis often become serious problems, one of which is interdialytic weight gain, which cannot be tolerated by the body. Weight gain due to excess fluid in patients undergoing hemodialysis leads to shortness of breath and heart failure. This condition can be a triggering factor for death in patients undergoing hemodialysis[1], [2].

Globally, the prevalence of chronic kidney failure increased by 21.3% and the mortality rate increased by 41.5% between 1990 and 2017 [3].

Chronic kidney failure is the 12th leading cause of death worldwide [4]. Based on WHO data, in 2022, there were 697.5 million patients with chronic kidney failure, and as many as 1.2 million patients died. Meanwhile, the prevalence of increasing interdialytic weight gain (IDWG) values has increased in several countries, approximately 9.7%–49.5% in the American Union and 9.8%–70% in Europe[5]–[7]

According to the Indonesia Renal Registry report in 2018, there was a fairly high increase in the number of chronic kidney failure patients; in 2017, there were 32,831 new patients and 77,892 active patients undergoing hemodialysis therapy last year 2018 recorded a patient increase that was two times increased by 66,433 new patients and 132,142 active patients who underwent hemodialysis therapy.

North Sulawesi is a province with a significant increase in cases of chronic kidney failure over the last 10 years, namely 4,796 new patients. Based on data from SIM-RSUD Otonaha, there is an increase in cases of chronic kidney failure; namely, in 2021, there were 103 patients, while in 2022, there were 115 patients. In 2023, January–April, there will be 83 patients[7]–[9].

Patients undergoing hemodialysis must continue to limit or manage fluids and diet. Excessive fluid and food intake will have an impact on weight gain between the two dialysis times. Increasing the IDWG score has a serious impact; 60–80% of patients die due to excess fluid and food intake in the interdialytic period because this can result in pulmonary edema or congestion. There are several factors that influence the increase in IDWG scores, one of which is self-efficacy. Self-efficacy plays an important role in a person's ability to organize and carry out the programs of action needed to cope with situations that arise. In previous research, good self-efficacy was influenced by the experience of patients who had undergone hemodialysis for a long time, namely  $\geq 12$  months, and had strong confidence and motivation to comply with hemodialysis. So this research was only conducted on respondents with a hemodialysis duration of  $\geq 12$  months[8], [10]–[13].

Based on data from preliminary studies conducted by researchers on March 6, 2023, in the hemodialysis room at Otonaha District Hospital, it was found that the patient's body weight measurements before and after hemodialysis. The results of observations made on 5 patients showed that 2 patients experienced an increase in IDWG of 2.5%, 2 patients experienced an increase of 4%, and 1 patient experienced an increase of 7%. Self-efficacy is closely related to an individual's desire and belief to engage in healthy behaviors, namely fluid control (Reeves et al., 2017). This may be one of the factors that leads to a normal IDWG score. [14]–[17]. The aim of this study was to analyze the correlation between self-efficacy and IDWG index in patients with chronic kidney disease.

## 2. Methods

The methods follow the following structure:

### 2.1 Research design

This type of research is quantitative correlational with a cross-sectional approach, namely measurements or data collection are carried out simultaneously in one time.

### 2.2 Setting and sample

This research was conducted in the hemodialysis room at Otonaha Regional Hospital in North Sulawesi in March and April 2023. Samples were taken using a purposive sampling technique, so a sample of 60 respondents was obtained.

### 2.3 Instruments and data collection

The instruments used in this research were questionnaire sheets and observation sheets. Self-efficacy is measured using a questionnaire containing 8 items, including 7 positive and 1 negative question. Meanwhile, IDWG is measured using sheet observation with the method of writing the body weight of the first post-hemodialysis respondent and the pre-hemodialysis respondent. Collection of data using primary and secondary data. Primary data was obtained directly from respondents, while secondary data was obtained from respondents' medical records.

### 2.4 Data analysis

Data analysis in this research includes univariate analysis and bivariate analysis using the Pearson correlation test to determine the correlation between variables with a p-value  $< 0.05$ .

### 2.5 Research ethics

The ethical principles of this research are providing informed consent, the right to autonomy, confidentiality, justice, and anonymity.

## 3. Results

Results analysis showed that the type of respondent sex was more more than female respondents, with a percentage of 53.3% men and 46.7% women. The average respondent was 49.5 years old. Of the 60 respondents, it showed that the length of time they underwent HD was dominated by respondents who underwent HD  $> 24$  months, namely 36 people with a percentage of 60%. The demographic and clinical characteristics of the participants are shown in Table 1.

**Table 1. Respondent characteristics**

Characteristics	Frequency	Percentage
Age	years	
Mean:	49.5	
Maximum:	78	-
Minimum:	28	

Characteristics	Frequency	Percentage
Gender		
Male	32	53.3%
Female	28	46.7%
HD duration		
<12 months		
12 – 24 months	24	40%
> 24 months	36	60%

The average self-efficacy score of respondents was 23.4, and the results of the analysis showed that of

the 60 respondents, the average IDWG score of respondents was 2.7%. It is shown in Table 2.

**Table 2. Self-efficacy and IDWG score**

Characteristics	Frequency	Percentage
Self Efficacy		
Mean:	23.4	
Maximum	32	-
Minimum :	10	
IDWG score		
Mean:	2.7	
Maximum	10.3	
Minimum	0	

The results of the analysis between self-efficacy and the IDWG score in kidney failure patients obtained a p-value of 0.03 (p-value < 0.05), so it can be seen that there is a very strong relationship between self-efficacy and the IDWG score because the coefficient score is -0.940 and shows the direction of a negative relationship. So if the self-efficacy score is high, then the IDWG score is low, and vice versa, if the self-

efficacy score is low, then the IDWG score will increase. The statistical test results show that the hypothesis is accepted, which means that self-efficacy has a relationship with the interdialytic weight gain (IDWG) score in chronic kidney failure patients in the hemodialysis room at Otanaha Regional Hospital North Sulawesi.

**Table 3. Correlation of self-efficacy with interdialytic weight gain (IDWG) score**

Variables	Interdialytic Weight Gain (IDWG) (Frequency)	Pearson Correlation	P-value
<i>Self Efficacy</i>	60	-0.940	0.03

#### 4. Discussion

The results of the study show that the average value of respondents' self-efficacy is 23.4, with a minimum score of 8 and a maximum score of 40. The lower the score obtained, the worse the respondent's self-efficacy, and the higher the score obtained, the better the respondent's self-efficacy. Self-efficacy plays an important role in a person's ability to organize and carry out the programs of action needed to cope with situations that occur. Individuals who have the belief that they can carry out behaviors that can support their health will tend to have the desire to try and change. A person's self-efficacy not only influences their behavior in

maintaining health but also influences their mindset. Patients who have a history of chronic disease with low self-efficacy will also have low treatment adherence or commitment.[11], [14], [17], [18]

Therefore, patients with chronic kidney failure undergoing hemodialysis need good self-efficacy. Good self-efficacy will have an impact on the choices made and actions taken by the individual in carrying out their duties, where the individual is competent and confident so that the individual can control himself. Self-efficacy has a role in the initiation and maintenance of health behavior, so it is believed that increasing self-

efficacy in health behavior will result in improved health and a normal IDWG score, so that a person's IDWG score can be seen through self-efficacy itself. The average Interdialytic Weight Gains (IDWG) score from 60 respondents was 2.7, with a minimum score of 0 and a highest score of 10.3. The IDWG score range is normal and can be tolerated by the body because  $<3$ . increasing an IDWG that is too high can have negative effects on the patient[10], [12]–[14], [17], [19].

IDWG is the weight gain between two hemodialysis sessions. The higher the IDWG, the more fluid in the body. IDWG that can be tolerated by the body is no more than 1.0–1.5 kg, or no more than 3% dry body weight. Adding an IDWG value that is too high can cause negative effects on the body, including hypotension, muscle cramps, shortness of breath, nausea, and vomiting [20]–[22]

An increase in the IDWG score in hemodialysis patients is often caused by the patient's lack of compliance with fluid and food salt restrictions. Self-efficacy in hemodialysis patients also has an impact on IDWG. Having good self-efficacy can increase patient compliance with treatment, so self-efficacy can be an effective strategy in managing treatment compliance and interdialytic weight gain, or IDWG[11], [21], [22]

The results of the Pearson correlation statistical test obtained a p-value of 0.03 ( $p$  value  $< 0.05$ ), which shows that the hypothesis is accepted or that self-efficacy is related to the Interdialytic Weight Gain (IDWG) score in patients with chronic kidney failure. The coefficient score obtained is  $-0.901$ , which states that the relationship between variables is very large or very strong with a negative relationship direction, which means that the higher the self-efficacy value, the lower the IDWG score or vice versa. This research is in line with research conducted by Priska et al. (2019) in their research showing a relationship between self-efficacy and IDWG ( $p$ -value 0.001). And research conducted by Making et al. (2022) using the chi-square statistical test with a p-value of 0.00 shows that there is a relationship between self-efficiency and the IDWG score[11], [12], [15].

In this study, there were more male respondents, namely 32 people, compared to female respondents, namely 28 people. This research is in line with research conducted by Wayunah et al. (2022) that found that there were more male respondents than female respondents, namely 49 male respondents and 36 female respondents. Men clinically have a high risk of developing chronic

kidney failure, two times greater than women. This happens because the majority of men smoke. Men who are active smokers are associated with an increase in high blood pressure because the nicotine contained in cigarettes will cause an increase in blood pressure. Apart from that, men also pay less attention to health and maintain their lifestyle than women[2], [12], [14], [23]

This study found the average age was 49.5 years. Age 40 years or older will see a progressive decrease in glomerular filtration rate (GFR) until age 70 years, approximately 50%. Tubular functions, including reabsorption capacity and concentration, are also reduced. This causes kidney failure. That is why most patients suffering from kidney failure are detected after they are over 40 years old. Meanwhile, for the duration of hemodialysis, respondents were dominated by those who had undergone HD  $>24$  months. Making et al. (2022) stated that there was a relationship between the duration of HD and IDWG, as evidenced by respondents who underwent HD  $> 12$  months having good IDWG. Apart from that, according to Khoiriyah et al. (2020), good self-efficacy is also influenced by patient experience. Patients who have been undergoing hemodialysis for a long time, namely  $\geq 12$  months, have a strong sense of self-confidence and motivation to comply. hemodialysis. Bayhakki et al. (2017) stated that the longer the patient undergoes HD therapy, the more opportunities the patient will have to adapt to the therapy program. Likewise, new patients undergoing HD therapy tend to be maladaptive to the therapy program they are undergoing; new patients have a high potential for violations such as diet rules because they are not used to it, which hinders compliance with the therapy program[12], [16], [17], [22], [24].

The problem faced by chronic kidney failure patients undergoing hemodialysis is that they are less able to suppress weight gain between two dialysis sessions, or IDWG. Weight gain in CKD patients will always occur because the kidneys fail to remove metabolic waste in the form of water, electrolytes, and other metabolic waste. IDWG is considered a measure of patient compliance when undergoing hemodialysis therapy[16]. Improvements in IDWG that are too high can cause negative effects on the body, including hypotension, muscle cramps, shortness of breath, nausea, and vomiting[20]

Restricting fluid intake in chronic kidney failure patients undergoing hemodialysis is an

important thing to pay attention to because excessive fluid intake can cause weight gain, edema, fluid accumulation in the lungs, swollen eyelids, and shortness of breath due to excess fluid volume. Chronic kidney failure patients are also advised to be able to carry out effective self-management to reduce the stress felt by the patient. This is related to the level of self-efficacy of each patient. The higher the self-efficacy, the more the patient's awareness of carrying out self-management will increase [11], [14], [16], [22].

## 5. Conclusion

It can be concluded that good self-efficacy can reduce the IDWG index in chronic kidney failure patients in the hemodialysis room at Otanaha Regional Hospital. The average self-efficacy score for chronic kidney failure patients in the hemodialysis room at Otanaha Regional Hospital is 23.9. The average IDWG value in chronic kidney failure patients in the hemodialysis room at Otanaha Regional Hospital is 2.7%. The relationship between self-efficacy and IDWG scores in chronic kidney failure patients in the hemodialysis room at Otanaha Regional Hospital is p-value 0.03, and it is recommended that this research be used as reference material and provide nursing interventions in the form of education on the application of self-efficacy.

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## 7. References

- [1] P. Yang *et al.*, "Fazriansyah et al, Hubungan Antara Kepatuhan," *Din. Kesehat.*, vol. 9, no. 2, p. 340, 2018.
- [2] A. Saroni, "Activities of daily living in chronic kidney disease patients undergoing hemodialysis at RSUD Subang ARTICLE INFO," *INJ Indones. Nurs. J. CC BY*, vol. 1, no. 1, pp. 2023–2045, 2023, [Online]. Available: [www.ejournal.polsub.ac.id/index.php/inj](http://www.ejournal.polsub.ac.id/index.php/inj)
- [3] GBD Chronic Kidney Disease Collaboration, "Global, regional, and national burden of chronic kidney disease, 1990-2017: a systematic analysis for the Global Burden of Disease Study 2017," *Lancet (London, England)*, vol. 395, no. 10225, pp. 709–733, Feb. 2020, doi: 10.1016/S0140-6736(20)30045-3.
- [4] PAHO, "Burden of Kidney Diseases," 2019. [Online]. Available: <https://www.paho.org/en/enlace/burden-kidney-diseases>
- [5] World Health Organization, *Noncommunicable Diseases Country Profiles 2022*. Geneva: WHO, 2022.
- [6] Riskesdas, "Riset Kesehatan Dasar (RISKESDAS) 2018." Kementerian Kesehatan Badan Penelitian dan Pengembangan Kesehatan, Jakarta, 2018.
- [7] Kemenkes RI, *Profil Kesehatan Indonesia 2022*. [Online]. Available: <https://www.kemkes.go.id/downloads/resources/download/pusdatin/profil-kesehatan-indonesia/Profil-Kesehatan-2021.pdf>
- [8] PERNEFRI, *Perhimpunan Nefrologi Indonesia (PERNEFRI)*, vol. 53, no. 9. 2013.
- [9] R. Otanaha, "Profil RSUD Otanaha," Manado, 2022.
- [10] S. Khoiriyah, E. S. Purbaningsih, and Wahyuni, "Hubungan Self Efficacy Dengan Kepatuhan Menjalani," *J. Kesehat. MAHARDIKA J. homepage www.jurnal.stikesmahardika.ac.id Hub.*, vol. 7, no. 26141663, pp. 19–26, 2020, [Online]. Available: [www.jurnal.stikesmahardika.ac.id%0AHUBUNGAN](http://www.jurnal.stikesmahardika.ac.id%0AHUBUNGAN)
- [11] L. Wijayanti, A. Jahriyah, A. Yusuf, and P. M. P. Winoto, "The Relationship of Self-efficacy With Increased Interdialytic Weight Gains in Hemodialysis Patients," *Malaysian J. Med. Heal. Sci.*, vol. 19, no. May, pp. 37–42, 2023.
- [12] N. Isnaini, D. A. Styandini, and D. Ratnasari, "The effect of using booklets on patients' self-efficacy knowledge and interdialytic weight gain," *Bali Med. J.*, vol. 10, no. 3 Special Issue ICONURS, pp. 1103–1106, 2021, doi: 10.15562/bmj.v10i3.2840.
- [13] W. Wayunah and M. Saefulloh, "Self-Efficacy Berhubungan dengan Interdialytic Weight Gain (IDWG) pada Pasien GGK di RSUD Indramayu," *Bima Nurs. J.*, vol. 3, no.

- 2, p. 93, 2022, doi: 10.32807/bnj.v3i2.872.
- [14] N. P. Priska and S. Herlina, "Efikasi Efikasi Diri Pembatasan Cairan Terhadap Intradialytic Weight Gain Pasien Gagal Ginjal Kronik di Ruang Hemodialisa RSUD Pasar Minggu," *J. Ilm. Ilmu Keperawatan Indones.*, vol. 9, no. 02, pp. 601–608, 2019, doi: 10.33221/jiiki.v9i02.226.
- [15] M. A. Makin, Y. Beta, and P. Selasa, "Analisis faktor interdialytic weight gains (IDWG) pasien hemodialisa di RSUD Prof. Dr. W. Z Johannes Kota Kupang," *Nurs. Updat. Ilm. ilmu keperawatan*, vol. 13, no. 3, pp. 192–205, 2022.
- [16] W. Wayunah, "Self-Efficacy and Compliance Fluid Intake Restriction as a Determinant of The Interdialytic Weight Gain (IDWG) Level," *J. Nurs. Care*, vol. 5, no. 1, pp. 21–29, 2022, doi: 10.24198/jnc.v5i1.36233.
- [17] M. D. S. LUMBAN GAOL, "The The Relationship of Self Efficacy of Fluid Control and Interdialytic Weight Gain (IDWG) at Hemodialysis Unit, Panti Rapih Hospital, Yogyakarta," *Caring J. Keperawatan*, vol. 10, no. 2 SE-Article, pp. 154–165, Aug. 2021, doi: 10.29238/caring.v10i2.1074.
- [18] W. Welly and H. Rahmi, "Self Efficacy Dengan Kualitas Hidup Pasien Gagal Ginjal Kronik Yang Menjalani Hemodialisa," *J. Keperawatan Abdurrab*, vol. 5, no. 1, pp. 38–44, 2021, doi: 10.36341/jka.v5i1.1791.
- [19] A. Ramadhanti, Bayhakki, and Jumaini, "Analisis Self Efficacy dan Interdialytic Weight Gain (IDWG) pada Pasien Hemodialisis : Literature Review," *J. Med. Utama*, vol. 03, no. 04, pp. 2997–3006, 2022, [Online]. Available: <http://jurnalmedikahutama.com>
- [20] Ginting and BrEmmi, "Pengaruh Usia, Jenis Kelamin, Dan Lamanya Hemodialisa Terhadap Nilai Interdialytic Weight Gain (IDWG) Pada Pasien Dewasa Gagal Ginjal Kronik Yang Menjalani Hemodialisa Rutin Di RSUD Budhi Asih," 2019. [Online]. Available: <https://repository.binawan.ac.id/3/>
- [21] M. D. S. L. Gaol, T. T. Pujiastuti, and Y. Wardani, "The The Relationship of Self Efficacy of Fluid Control and Interdialytic Weight Gain (IDWG) at Hemodialysis Unit, Panti Rapih Hospital, Yogyakarta," *Caring J. Keperawatan*, vol. 10, no. 2 SE-Article, pp. 154–165, Aug. 2021, doi: 10.29238/caring.v10i2.1074.
- [22] B. Bayhakki and Y. Hasneli, "Hubungan Lama Menjalani Hemodialisis dengan Inter-Dialytic Weight Gain (IDWG) pada Pasien Hemodialisis," *J. Keperawatan Padjadjaran*, vol. 5, no. 3, pp. 242–248, 2018, doi: 10.24198/jkp.v5i3.646.
- [23] I. Logani, H. Tjitrosantoso, and A. Yudistira, "Faktor Risiko Terjadinya Gagal Ginjal Kronik Di Rsup Prof. Dr. R. D. Kandou Manado," *J. Ilm. Farm.*, vol. 6, no. 3, pp. 128–136, 2017.
- [24] S. Mcguire, E. J. Horton, D. Renshaw, A. Jimenez, N. Krishnan, and G. Mcgregor, "Hemodynamic Instability during Dialysis: The Potential Role of Intradialytic Exercise," *Biomed Res. Int.*, vol. 2018, 2018, doi: 10.1155/2018/8276912.