Indonesian Journal of Global Health Research
Volume 8 Number 3, June 2026
e-ISSN 2715-1972; p-ISSN 2714-9749
http://jurnal.globalhealthsciencegroup.com/index.php/IJGHR

THE EFFECT OF THE INFORMATION MOTIVATION BEHAVIORAL SKILLS (IMB) MODEL ON FLUID ADHERENCE OF HEMODIALYSIS PATIENTS

Safruddin[1]*, Nurul Husnah[2], Rika Novita[3], Arya Zahwa Abila Junaedi[3]
[1]Nurse Professional Study Program, Faculty of Public Health, Universitas Muslim Indonesia, Jl. Urip Sumoharjo Km. 05, Karuwisi Utara, Panakukkang, Makassar 90231, Indonesia
[2]Midwifery Study Program, Faculty of Public Health, Universitas Muslim Indonesia, Jl. Urip Sumoharjo Km. 05, Karuwisi Utara, Panakukkang, Makassar 90231, Indonesia
[3]Nursing Study Program, Faculty of Public Health, Universitas Muslim Indonesia, Jl. Urip Sumoharjo Km. 05, Karuwisi Utara, Panakukkang, Makassar 90231, Indonesia
*safruddin.safruddin@umi.ac.id

ABSTRACT
Patients undergoing hemodialysis therapy often experience problems with excessive Interdialytic Weight Gain (IDWG) increase. The Information–Motivation–Behavioral Skills (IMB) model has been widely used in health behavior modification, but its application to fluid management of hemodialysis patients is still limited. Therefore, IMB-based interventions are needed to improve fluid adherence. This study aims to determine the influence of the IMB model on fluid adherence (IDWG) of hemodialysis patients. This study uses a quasi-experiment design with a two-group pretest-posttest approach, namely the intervention group and the control group. A total of 70 hemodialysis patients were divided into two groups, each of which was given different treatment. The intervention group received IMB-based education for 4 weeks, including information improvement, personal and social motivation, and behavioral skills. Data were collected from haemodialysis patients who met the inclusion criteria through observation sheets. Interdialytic weight gain (IDWG) was assessed by calculating the difference between post-dialysis and pre-dialysis body weight. Statistical analysis using Wilcoxon and Mann–Whitney tests. There was a significant effect on IDWG in the intervention group with p = 0.000, while the control group showed no significant change (p = 0.165). There was a significant difference between the two groups in IDWG after intervention with p = 0.003. The application of the Information Motivation Behavioral Skills (IMB) Model education has proven to be effective in improving fluid adherence of patients undergoing hemodialysis therapy. The application of the Information Motivation Behavioral Skills (IMB) model education is recommended as part of standard practice in fluid management of hemodialysis patients.

Keywords: behavioral; CKD; hemodialysis; IDWG; motivation

How to cite (in APA style)
Safruddin, S., Husnah, N., Novita, R., & Junaedi, A. Z. A. (2026). The Effect of the Information Motivation Behavioral Skills (IMB) Model on Fluid Adherence of Hemodialysis Patients. *Indonesian Journal of Global Health Research*, *8*(3), 895–902. https://doi.org/10.37287/ijghr.v8i3.1052.

INTRODUCTION

Chronic kidney failure is a clinical condition characterized by a progressive and irreversible decline in kidney function. CKD disease is the leading cause of morbidity and mortality globally. According to the Global Burden of Disease study in 2019, chronic kidney failure is among the top ten risks associated with the highest number of deaths worldwide, with a death toll of 3.16 million deaths (Luyckx et al., 2018). The results of the Basic Health Research (Riskesdas) show that the prevalence of chronic kidney failure has increased from 2.0% in 2013 to 3.8 people per 1000 population in 2018 (Basic Health Research, 2018).

Chronic kidney failure disease that is not treated properly will reach a critical stage known as End Stage Renal Disease (ESRD). ESRD patients require kidney replacement therapy to survive, such as hemodialysis (HD), peritoneal dialysis, and kidney transplant, (Rivara & Mehrotra, 2018). Chronic kidney failure disease that is not treated properly will reach a critical stage known as End Stage Renal Disease (ESRD). ESRD patients require kidney replacement therapy to survive, such as hemodialysis (HD), peritoneal dialysis, and kidney transplant(Jung & Park, 2011). This process in

addition to removing waste materials, several important products are added to the blood (Wanek et al., 2012).

Patients who undergo hemodialysis therapy experience improvement, but patients still face many physical, mental, and social problems. Physical symptoms such as fatigue, cramps, pain, sleep disturbances, dyspnea, pruritis, depression, nausea, vomiting, and constipation all affect an individual's daily life and quality of life (Kaplan Serin et al., 2020). Patients undergoing HD therapy will experience changes in their lives, so they must adhere to a strict therapy regimen, including diet control, fluid restriction, and medication adherence. Non-compliance can result in increased Interdialytic Weight Gain (IDWG), serious deterioration in health, and prolonged hospital stays (D'Onofrio et al., 2017; Naderifar et al., 2019). This can have an impact on the prevalence of increasing the duration of hemodialysis therapy.

Research conducted by Dantas identified an increase in IDWG as the cause of all causes of death among HD patients (Dantas et al., 2019). Ibrahim's research reported that 36% of HD patients did not adhere to the duration of HD treatment, while Goma found that 55% did not adhere to dietary restrictions (Ibrahim et al., 2015). Ketidakpatuhan terhadap durasi dialisis dan melewatkan sesi HD menyebabkan hiperkalemia, yang merupakan prediktor utama kematian kardiovaskular di antara pasien HD (Bernier-Jean et al., 2021). The results of previous research also obtained an increase in understanding after educational interventions there was an increase in participants' understanding of the importance of a liquid diet and nutrition in patients (Safruddin et al., 2022). Self-efficacy to improve fluid adherence, quality of life of hemodialysis patients (safruddin Safruddin & Andi Mappanganro, 2020), (S. Safruddin & Ulfah Mutthalib, 2024).

Interdialytic weight gain (IDWG) should be lower than 4.0 to 4.5% dry weight (Depner et al., 2006). Unfortunately, many patients undergoing hemodialysis therapy have IDWGs that are higher than these standard values (Bossola et al., 2018; Wong et al., 2017). Adherence to dietary restrictions is significantly associated with improved patient health, while non-compliance carries a risk of complications leading to death (Kimmel et al., 2020). These conditions can lead to additional dialysis sessions resulting in a decrease in quality of life and a significant increase in costs. Therefore, an intervention is needed to comply. Previous research has shown that conventional approaches have not been fully successful in addressing the issue of fluid adherence and quality of life of hemodialysis patients because no one has focused on the IMB model approach to the integration of nutritional aspects and often ignores the psychological and behavioral factors that affect patient adherence. Therefore, an intervention is needed to comply and improve the quality of life.

One of the interventions that can be carried out to improve fluid adherence is the Behavioral Motivational Information Skills Model (IMB) which has been recognized as one of the effective theoretical frameworks in improving self-management in hemodialysis patients. Recent studies have shown that this model is able to predict the success of patients' health behaviors through strengthening three main elements, namely relevant information, personal and social motivation, and adequate behavioral skills. The effectiveness of this model is seen in particular in improving patient adherence to dietary and fluid restrictions, which are important components in the management of hemodialysis (Kim et al., 2019)(S Hi Arsan et al., 2024). Thus, the IMB serves not only as a conceptual tool, but also as a basis for the implementation of educational interventions oriented towards better clinical outcomes. This study designed an educational program to increase knowledge and motivation as well as behavior specifically aimed at nurses who treat end-stage CKD patients undergoing hemodialysis therapy. Through this approach, the intervention is expected to contribute to improved fluid adherence to the control of interdialytic weight gain in chronic kidney disease patients undergoing hemodialysis. Therefore, this study aims to evaluate the effect of the Behavioral Motivational Information Skill Model (IMB) on the adheren fluid ce of interdialytic waight gain in patients undergoing hemodialysis therapy.

METHOD

The research methodology used in this study is a quantitative approach that aims to explore the influence of the information motivation behavioral skills (IMB) model on the fluid adherence of hemodialysis patients. This study uses a quasi-experimental design with a two-group pretest–posttest approach. This design was chosen because it allows the evaluation of the effectiveness of the Model Information Motivation Behavioral Skills (IMB) intervention in hemodialysis patients, while maintaining routine clinical conditions without interfering with the therapy schedule. The intervention group received an information motivation behavioral skills (IMB) education program, while the control group received standard education from the hemodialysis unit. The study lasted for 4 weeks, according to the duration of behavioral interventions recommended in the previous IMB study. The sample was obtained through consecutive sampling with a total of 70 respondents who met the inclusion criteria: ≥18 years old, able to communicate, and willing to participate in interventions. Respondents were divided into two groups, namely the intervention group and the control group, each consisting of 35 patients. Before and after the intervention, both groups underwent IDWG measurements.

The IMB Model Intervention was carried out for 4 weeks through four structured educational sessions that included three main components, namely information in the form of education about fluid restriction, IDWG risk, and thirst management, motivation through strengthening personal motivation and family support, and behavioral skills in the form of fluid intake recording exercises, self-monitoring IDWG, and problem-solving skills against the trigger of excessive drinking. The intervention was administered face-to-face during the hemodialysis session, with a duration of 20–30 minutes per session. The control group received standard education according to the procedure of the hemodialysis unit. Data analysis was carried out by the Kolmogorov-Smirnov test to assess the distribution of data. In this study, data were obtained with a normal deficit. while statistical tests were carried out using the Wilcoxon Signed Rank Test for analysis in paired groups and the Mann–Whitney U Test for comparison between unpaired groups. when the data were not normally distributed. The significance level was set at $p < 0.05$. This research has been approved by the University's Research Ethics Committee (Approval Number: 930/A.1/KEP-UMI/2025) and has received permission from the local research site authority. All respondents had given informed consent prior to participating in the study. The confidentiality of all participants was strictly maintained during the research process

RESULT

The results of the study on the effect of the Information Motivation Behavioral Skills (IMB) Model on fluid compliance. The respondents in this study were patients with chronic kidney failure who underwent routine hemodialysis therapy as many as 70 patients. The study was conducted by dividing respondents into two groups, namely 35 people for the control group who did not receive education about the Information Motivation Behavioral Skills model, 35 people in the educational intervention group about the Information Motivation Behavioral Skills model. Design This study is quasi-experimental aiming to find out a symptom or influence that arises as a result of a certain treatment using a *two-Group Pretest-Postest design.* Based on the results of the data processing carried out, the characteristics of the respondents, Univariate analysis and bivariate analysis can be obtained as follows:

Table 1.
Distribution of Respondent Frequencies by Age and Duration of Hemodialysis

Variabel		n	Mean	SD	Min-Mak	95% CI
Age	Intervention	35	49.54	14.41	22-80	44.59-54.50
	Control	35	52.31	11.38	36-81	48.40-56.22
Long live HD	Intervention	35	21.89	19.71	1-71	15.11-28-66
	Control	35	18.03	16.86	1-60	12.24-23.82

In table 1. The average age in the Intervention group was 49.54 years (SD±14.41). The youngest age is 22 years old and the oldest is 80 years old. From the results of the interval estimation, it can

be concluded that 95% are believed to have an average lifespan between 44.59 years and 54.50 years. Meanwhile, the average age in the control group was 52.31 years (SD±11.38). The youngest age is 36 years old and the oldest is 81 years old. From the results of the interval estimation, it can be concluded that 95% are believed that the average age is between 48.40 years to 56.22 years. Meanwhile, the average length of time patients underwent hemodialysis in the intervention group was 21.89 months (SD±19.71). The most recent hemodialysis period was 1 month and the longest was 71 months. From the results of the interval estimation, it can be concluded that 95% are believed to have an average fatigue level between 15.11 and 28.66 months. Meanwhile, the average length of time patients underwent hemodialysis therapy in the control group was 18.03 (SD±16.86). The most recent hemodialysis period is 1 month and the longest is 60 months. From the results of the interval estimation, it can be concluded that 95% are believed to have undergone hemodialysis on average between 12.24 and 23.82 months.

Table 2.
Gender of the Intervention and Control Group of Clients Undergoing Hemodialysis Therapy

Gender	Intervention Groups		Control Group		Total	
	f	%	f	%	f	%
Man	15	21.4	18	25.7	33	47.1
Woman	20	28.6	17	24.3	37	52.9

Table 2. showed that the male sex was 33 patients in the intervention group of 15 patients (21.4%) and the control group of 18 patients (25.7%). Meanwhile, 37 female respondents were female with an intervention group of 20 patients (28.6%) and a control group of 17 (24.3%).

Table 3.
Fluid Compliance Distribution (IDWG) Before and After Treatment in the Hemodialysis Patient Intervention and Control Group

variabel	N	Mean	SD	Min-Mak	95% CI
IDWG pre					
Intervention	35	3.600	±1.530	1.3-7.7	3.07-4.12
Control	35	3.886	±1.694	1.6-6.5	3.30-4.46
IDWG Post					
Intervention	35	2.511	±0.936	1.0-5.0	2.19-2.83
Control	35	3.771	±1.579	1.6-8.1	3.22-4.31

Table 3. The average percentage of Interdialytic Weight Gain (IDWG) before treatment in the intervention group was 3,600% (SD±1,530), the lowest score was 1.3% and the highest score was 7.7%. From the results of the interval estimation, it can be concluded that 95% believe that the IDWG score before treatment in the intervention group is between 3.07% and 4.12%. While the mean value of Interdialytic Weight Gain (IDWG) in the control group was 3.886% with (SD±0.985), the lowest IDWG was 1.6% and the highest score was 6.5%. From the results of the interval estimation, it can be concluded that 95% believe that the IDWG score ranges from 3.30% to 4.46%. Meanwhile, the average score of Interdialytic Weight Gain (IDWG) after treatment in the intervention group was 2.511% with (SD±0.936). The lowest IDWG score was 1.0% and the highest score was 5.0%. From the results of the interval estimation, it can be concluded that 95% believe that the IDWG score is between 2.19% to 2.80%. Meanwhile, in the control group, the average IDWG score was 3,771% (SD±1,579), the lowest IDWG was 1.6% and the highest score was 8.1%. From the results of the interval estimation, it can be concluded that 95% believe that the IDWG score ranges from 3.22% to 4.31%.

In table 4. The results of the statistical test obtained a value *of p* = 0.000, so it can be concluded that there is a significant difference between Interdialytic Weight Gain (IDWG) before and after treatment in the intervention group. Statistical tests were carried out using *the wilcoxon* statistical test.Meanwhile, in the group, the results of the statistical test showed a value *of p* = 0.165, so it can be concluded that there was no significant difference between IDWG before and after treatment in the control group.

Table 4.

Analysis of Mean Liquid Compliance/Interdialytic Weight Gain (IDWG) Score before and after treatment in the Intervention Group and Control Group

Variabel	n	Mean	SD	*T*	Effect Size	*p Value*
Intervention						
Before After	35	1.088	1.318	4.886	0.826	0.000
Control						
Before After	35	0.114	0.476	1.41	0.240	0.165

Table 5.
Analysis of Differences in Fluid Compliance/Interdialytic Weight Gain (IDWG) After Treatment in the Control and Intervention Groups

IDWG	n	Mean	SD	*P Value*
Intervention	35	2.511	±0.936	
Control	35	3.771	±1.579	0.003

In table 5. Showing that the results of the statistical test obtained a value of p = 0.003, it can be concluded that there is a significant difference between IDWG after treatment in the intervention and control groups.

DISCUSSION

In this study, the Wilcoxon statistical test and the Mann-Whitney test were used. Before carrying out the inferential statistical test, a normality test was carried out using the Kolmogorov–Smirnov test to see whether the data was normally distributed. The results showed that the data was not normally distributed, so a non-parametric test was carried out as an alternative in the form of the Wilcoxon and Mann–Whitney tests. The findings of the sample characteristics in this study indicate that the average age of hemodialysis patients ranges from 49.5 to 52.3 years. Meanwhile, the average duration of hemodialysis is approximately 18 to 22 months. Epidemiological data supports that chronic kidney disease (CKD) and the need for dialysis increase significantly in the adult age group approaching old age (≥ 45 years). This strengthens the research's relevance to the high rates of chronic kidney disease with a high clinical burden (Hill et al., 2016). Meanwhile, the gender distribution showed that female patients (37 people) were slightly more than men (33 people), both in the intervention and control groups. This composition is in line with epidemiological reports in several Asian countries that women tend to undergo hemodialysis more. Other studies also reported that women underwent higher levels of HIV than men and had a higher symptom burden, greater symptom severity, poorer quality of life, longer recovery time after dialysis sessions, 18% higher risk of withdrawal from dialysis, and 20% higher hospitalization ratesi(Caplin et al., 2011). Similar research also said that women undergoing hemodialysis often reported higher physical symptoms, anxiety, and depression, resulting in lower quality of life than men (Feroze et al., 2011).

Patients who have been on hemodialysis therapy for a long time are often associated with increased symptoms such as fatigue, sleep disturbances, cognitive dysfunction, and pruritus (Sharif-Nia et al., 2024). This condition has the potential to affect the effectiveness of educational interventions, adherence to therapy, and the patient's ability to manage independent care. The results showed that there was a significant difference between Interdialytic Weight Gain (IDWG) before and after treatment in the intervention group, with a value of p = 0.000. These findings indicate that the interventions provided that allegedly focused on fluid restriction education, increased motivation, and improved fluid management skills were able to produce meaningful behavioral changes in fluid intake control during the inter-dialysis period. In line with these results which show that educational and behavioral interventions significantly lower IDWG in hemodialysis patients (Bossola et al., 2022a). These findings reinforce the evidence that behavior-change-based therapies are effective in optimizing fluid management.

In contrast to the intervention group, the control group showed a value of p = 0.165 indicating no

significant change between the IDWG before and after the measurement. The absence of this difference indicates that without educational or behavioral interventions, patients tend to maintain previous patterns of habits, including in terms of adherence to fluid restriction and a low-sodium diet. This is in line with Junika's research which shows that without structured education, patients' IDWG remains high and does not show any significant changes (Junika et al., 2023).

The results of the statistical test on the post-test measurement showed a value of p = 0.003, which means that there was a significant difference between the Interdialytic Weight Gain (IDWG) of the intervention group and the control group after the treatment was given. The results of this study show that improving knowledge, motivation, and behavioral skills including fluid intake management, self-monitoring, and consumption pattern management are effective in helping patients adjust fluid intake as recommended. These findings are consistent with meta-analytic studies on educational, counseling/behavioral, or psychological interventions in hemodialysis patients that can significantly reduce IDWG compared to the non-intervention group (Bossola et al., 2022b), (Sharp et al., 2005). Arsan's research also showed that the implementation of IMB significantly improved fluid dietary adherence and fluid restriction compared to the control group (p = 0.001) (S Hi Arsan et al., 2024). Similar findings were reported in studies using individualized education, where the intervention group showed a significant decrease in IDWG compared to controls, as well as improvements in dialysis parameters (Kt/V) three months after the intervention ended (Sajjadi et al., 2024). Similarly, research on structured education accompanied by visual media (images/videos/leaflets) was able to increase patients' self-efficacy perception of fluid restriction and significantly reduce IDWG (p = 0,04)

However, it should be noted that significant IDWG reductions are often relatively small quantitatively, so from a clinical perspective the effects may be limited if not accompanied by long-term efforts and regular monitoring (Bossola et al., 2022a). Thus, it should also be noted that the success of the intervention is highly dependent on the patient's consistency in applying behavioral skills, as well as environmental support (family, HD team). Previous studies have shown that low self-advocacy or patient communication with the team can be an obstacle in self-management (Natashia et al., 2019). Therefore, the results of this study show that a 1.088% decrease in IDWG is not only relevant but also strengthens the evidence that IMB-based interventions, especially elements of improving knowledge, motivation and behavioral skills can be an effective strategy in controlling fluid volume in HD patients. These results can be used as the basis for evidence-based treatment to systematically incorporate the components of education and behavioral training into hemodialysis nursing care, in order to improve fluid adherence and potentially improve the quality of life of patients undergoing hemodialysis therapy

CONCLUSION

The application of the Information Motivation Behavioral Skills (IMB) Model education has proven to be effective in improving fluid adherence of patients undergoing hemodialysis therapy. The results of statistical tests showed a significant influence between the application of the Information Motivation Behavioral Skills (IMB) Model and the compliance of hemodialysis therapy fluids as seen based on the patient's IDWG. Thus, the application of education is recommended the Information Motivation Behavioral Skills (IMB) model as part of standard practice in fluid management of hemodialysis patients.

REFERENCES

Bernier-Jean, A., Wong, G., Saglimbene, V., Ruospo, M., Palmer, S. C., Natale, P., Garcia-Larsen, V., Johnson, D. W., Tonelli, M., Hegbrant, J., Craig, J. C., Teixeira-Pinto, A., & Strippoli, G. F. M. (2021). Dietary Potassium Intake and All-Cause Mortality in Adults Treated with Hemodialysis. Clinical Journal of the American Society of Nephrology, 16(12), 1851–1861. https://doi.org/10.2215/CJN.08360621

Bossola, M., Pepe, G., Antocicco, M., Severino, A., & Di Stasio, E. (2022a). Interdialytic weight gain and educational/cognitive, counseling/behavioral and psychological/affective interventions in patients on chronic hemodialysis: a systematic review and meta-analysis. In Journal of Nephrology (Vol. 35, Issue 8, pp. 1973–1983). Springer Science and Business Media Deutschland GmbH. https://doi.org/10.1007/s40620-022-01450-6

Bossola, M., Pepe, G., Antocicco, M., Severino, A., & Di Stasio, E. (2022b). Interdialytic weight gain and educational/cognitive, counseling/behavioral and psychological/affective interventions in patients on chronic hemodialysis: a systematic review and meta-analysis. Journal of Nephrology, 35(8), 1973–1983. https://doi.org/10.1007/s40620-022-01450-6

Bossola, M., Pepe, G., & Vulpio, C. (2018). The Frustrating Attempt to Limit the Interdialytic Weight Gain in Patients on Chronic Hemodialysis: New Insights Into an Old Problem. In Journal of Renal Nutrition (Vol. 28, Issue 5, pp. 293–301). W.B. Saunders. https://doi.org/10.1053/j.jrn.2018.01.015

Caplin, B., Kumar, S., & Davenport, A. (2011). Patients' perspective of haemodialysis-associated symptoms. Nephrology Dialysis Transplantation, 26(8), 2656–2663. https://doi.org/10.1093/ndt/gfq763

Dantas, L. G. G., De Seixas Rocha, M., Junior, J. A. M., Paschoalin, E. L., Paschoalin, S. R. K. P., & Sampaio Cruz, C. M. (2019). Non-adherence to Haemodialysis, Interdialytic weight gain and cardiovascular mortality: A cohort study. BMC Nephrology, 20(1). https://doi.org/10.1186/s12882-019-1573-x

Depner, T. A., Daugirdas, J. T., Goldstein, S., Ing, T. S., Kumar, V., Norris, K., Balk, E., Mahajan, A., Earley, A., Rebecca Persson, B., Gowri Raman, B., Kwack Yuhan, C., Chew, P., Stanley Ip, M., Chung, M., & Lau, J. (2006). Work Group Membership Work Group Co-Chairs Work Group. In Hemodialysis Adequacy.

D'Onofrio, G., Simeoni, M., Rizza, P., Caroleo, M., Capria, M., Mazzitello, G., Sacco, T., Mazzuca, E., Panzino, M. T., Cerantonio, A., Segura-Garcia, C., Andreucci, M., De Fazio, P., & Fuiano, G. (2017). Quality of life, clinical outcome, personality and coping in chronic hemodialysis patients. Renal Failure, 39(1), 45–53. https://doi.org/10.1080/0886022X.2016.1244077

Feroze, U., Noori, N., Kovesdy, C. P., Molnar, M. Z., Martin, D. J., Reina-Patton, A., Benner, D., Bross, R., Norris, K. C., Kopple, J. D., & Kalantar-Zadeh, K. (2011). Quality-of-Life and Mortality in Hemodialysis Patients. Clinical Journal of the American Society of Nephrology, 6(5), 1100–1111. https://doi.org/10.2215/CJN.07690910

Hill, N. R., Fatoba, S. T., Oke, J. L., Hirst, J. A., O'Callaghan, C. A., Lasserson, D. S., & Hobbs, F. D. R. (2016). Global Prevalence of Chronic Kidney Disease – A Systematic Review and Meta-Analysis. PLOS ONE, 11(7), e0158765. https://doi.org/10.1371/journal.pone.0158765

Ibrahim, S., Hossam, M., & Belal, D. (2015). Study of Non-Compliance among Chronic Hemodialysis Patients and its Impact on Patients' Outcomes. In Saudi J Kidney Dis Transpl (Vol. 26, Issue 2). http://journals.lww.com/sjkd

Jung, T.-D., & Park, S.-H. (2011). Intradialytic Exercise Programs for Hemodialysis Patients. Chonnam Medical Journal, 47(2), 61. https://doi.org/10.4068/cmj.2011.47.2.61

Junika, A., Susmiati, S., & Putra, H. (2023). Pengaruh Edukasi Berdasarkan Teori Efikasi Diri Terhadap Interdyalitic Weight Gain (Idwg) Pasien Gagal Ginjal Kronik Yang Menjalani Hemodialisis Di Unit Hemodialisa Rsup. Dr. M.Djamil Padang. Jurnal Ners, 7(1), 100–105. https://doi.org/10.31004/jn.v7i1.11796

Kaplan Serin, E., Ovayolu, N., & Ovayolu, Ö. (2020). The Effect of Progressive Relaxation Exercises on Pain, Fatigue, and Quality of Life in Dialysis Patients. Holistic Nursing Practice, 34(2), 121–128. https://doi.org/10.1097/HNP.0000000000000347

Kim, E. J., Lee, H. S., Shin, H. J., Hong, M. J., Kim, S. Y., Kim, S. A., & Kim, H. (2019). Effects of low intensity exercise training during hemodialysis on fatigue, activity of daily living, positive psychological capital, and blood pressure. Journal of the Korean Academy of Fundamentals of Nursing, 26(1), 63–73. https://doi.org/10.7739/jkafn.2019.26.1.62

Kimmel, P. L., Varela, M. P., Peterson, R. A., Weihs, K. L., Simmens, S. J., Alleyne, S., Amarashinge, A., Mishkin, G. J., Cruz, I., & Veis, J. H. (2020). Interdialytic weight gain and survival in hemodialysis patients: Effects of duration of ESRD and diabetes mellitus. Kidney International, 57(3), 1141–1151. https://doi.org/10.1046/j.1523-1755.2000.00941.x

Luyckx, V. A., Tonelli, M., & Stanifer, J. W. (2018). The global burden of kidney disease and the sustainable development goals. Bulletin of the World Health Organization, 96(6), 414-422C. https://doi.org/10.2471/BLT.17.206441

Naderifar, M., Tafreshi, M. Z., Ilkhani, M., Akbarizadeh, M. R., & Ghaljaei, F. (2019). Correlation between quality of life and adherence to treatment in hemodialysis patients. Journal of Renal Injury Prevention, 8(1), 22–27. https://doi.org/10.15171/jrip.2019.05

Natashia, D., Yen, M., Chen, H., & Fetzer, S. J. (2019). Self-Management Behaviors in Relation to Psychological Factors and Interdialytic Weight Gain Among Patients Undergoing Hemodialysis in Indonesia. Journal of Nursing Scholarship, 51(4), 417–426. https://doi.org/10.1111/jnu.12464

Riset Kesehatan Dasar. (2018). Laporan_Nasional_RKD2018_FINAL.pdf. In Badan Penelitian dan Pengembangan Kesehatan (pp. 221–222).

Rivara, M. B., & Mehrotra, R. (2018). Timing, Initiation, and Modality Options for Renal Replacement Therapy. In Chronic Kidney Disease, Dialysis, and Transplantation: A Companion to Brenner and Rector's The Kidney (pp. 286-296.e4). Elsevier. https://doi.org/10.1016/B978-0-323-52978-5.00019-7

S Hi Arsan, Z., Sjattar, E. L., & Arafat, R. (2024). Enhancing adherence to diet therapy and fluid restrictions in hemodialysis patients: a study using the information-motivation-behavioral skills model. Healthcare in Low-Resource Settings. https://doi.org/10.4081/hls.2024.13122

Safruddin, safruddin, & Andi Mappanganro. (2020). Efektivitas Pelatihan Efikasi Diri Untuk Meningkatkan Kepatuhan Intake Cairan pada Pasien yang Menjalani Terapi Hemodialisis di Rumah Sakit Tingkat II Pelamonia. Jurnal Penelitian Kesehatan Suara Forikes, 11.

Safruddin, Asfar, A., Hidayat, R., Faradillah, Y., & Jama, F. (2022). Edukasi Pentingnya Diet Cairan dan Nutrisi pada.

Safruddin, S., & Ulfah Mutthalib, N. (2024). Efikasi Diri Meningkatkan Kualitas Hidup Pasien Gagal Ginjal Kronik Yang Menjalani Terapi Hemodialisis. Bina Generasi : Jurnal Kesehatan, 16(1), 6–11. https://doi.org/10.35907/bgjk.v16i1.316

Sajjadi, S. L., Ghafourifard, M., & Tayebi Khosroshahi, H. (2024). A Randomized Controlled Clinical Trial of Individualized Patient Education on Hemodialysis Adequacy and Interdialytic Weight Gain. Journal of Caring Sciences, 14(1), 5–13. https://doi.org/10.34172/jcs.025.33604

Sharif-Nia, H., Marôco, J., Froelicher, E. S., Barzegari, S., Sadeghi, N., & Fatehi, R. (2024). The relationship between fatigue, pruritus, and thirst distress with quality of life among patients receiving hemodialysis: a mediator model to test concept of treatment adherence. Scientific Reports, 14(1), 9981. https://doi.org/10.1038/s41598-024-60679-2

Sharp, J., Wild, M. R., Gumley, A. I., & Deighan, C. J. (2005). A Cognitive Behavioral Group Approach to Enhance Adherence to Hemodialysis Fluid Restrictions: A Randomized Controlled Trial. American Journal of Kidney Diseases, 45(6), 1046–1057. https://doi.org/10.1053/j.ajkd.2005.02.032

Wanek, M. R., Horn, E. T., Elapavaluru, S., Baroody, S. C., & Sokos, G. (2012). Safe use of hemodialysis for dabigatran removal before cardiac surgery. Annals of Pharmacotherapy, 46(9). https://doi.org/10.1345/aph.1R081

Wong, M. M. Y., McCullough, K. P., Bieber, B. A., Bommer, J., Hecking, M., Levin, N. W., McClellan, W. M., Pisoni, R. L., Saran, R., Tentori, F., Tomo, T., Port, F. K., & Robinson, B. M. (2017). Interdialytic Weight Gain: Trends, Predictors, and Associated Outcomes in the International Dialysis Outcomes and Practice Patterns Study (DOPPS). American Journal of Kidney Diseases, 69(3), 367–379. https://doi.org/10.1053/j.ajkd.2016.08.030