The Effect of Coaching Support Method on Interdialytic Weight Gain (IDWG) Changes Among Hemodialysis Patients

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ABSTRACT
This research aimed determine impact of Coaching Support Method on IDWG values in CKD patients receiving hemodialysis. This quasi-experimental analysis, conducted in 2023, engaged 28 hemodialysis patients in Garut, Indonesia. Subjects were randomly assigned to the control (n = 14) and intervention (n = 14) groups, The intervention was performed in case group as 4 training sessions during 2 weeks based on coaching support. IDWG values were rechecked before and after intervention. Data analysis was performed using SPSS, applying dependent and independent t-tests, with statistical significance set at $p < 0.05$. The mean scores of IDWG values showed statistically difference before and after intervention in the intervention group (p-value < 0.05)). Additionally, the mean scores of IDWG values showed statistically difference in intervention group and control group (p-value < 0.05) following the two-week session. Coaching Support Method can be done as an effective method in hemodialysis patient for reducing IDWG values in CKD patients receiving hemodialysis.

1. Introduction

Chronic Kidney Disease (CKD) is characterized by a gradual decline in kidney function, showed by a glomerular filtration rate (GFR) below 60 ml/min per 1.732 m², persisting for more than three months. This impairment hampers the body ability to regulate metabolism and maintain fluid and electrolyte balance, leading to an accumulation of urea and nitrogen waste products in the bloodstream(CDC, 2022; S. Vaidya & Aeddula, 2022). Consequently, CKD disrupts body homeostasis, resulting in complications affecting multiple organ systems, including cardiovascular disease (Fujii et al., 2019; Tang et al., 2022), digestive issues (Tang et al., 2022; Thomas et al., 2013), respiratory problems (Alosayfir et al., 2016), nervous system diseases (Arnold et al., 2016), and in severe cases, mortality (Ferreira et al., 2020; Lee & Son, 2021). Timely intervention is essential to prevent and alleviate these life-threatening complications, with hemodialysis serving as the primary treatment modality frequently chosen by CKD patients (Jin et al., 2016; Lakshminarayana et al., 2017). Over time, there has also been a rise in the number of individuals in need of renal replacement therapy, specifically hemodialysis (HD) (Murdeshwar & Anjum, 2024; S. R. Vaidya & Aeddula, 2024) . HD is the most often utilized treatment for individuals with CKD in Indonesia, where 98% of patients use it (IRR, 2018)

Optimal fluid volume management in hemodialysis patients is a crucial aspect of dialysis adequacy; however, large fluctuations in volume remain a significant clinical challenge (Perl et al., 2017; Siriopol et al., 2017) . Proper fluid volume management in hemodialysis patients is crucial for both their experience and overall health outcomes (Dasgupta et al., 2019; La Porta et al., 2021). Excess fluid accumulation can lead to symptoms like peripheral edema and shortness of breath, and over time, it may contribute to conditions such as hypertension, left ventricular hypertrophy, and heart failure, all of which are linked to increased mortality ((Loutradis et al., 2021; Zoccali et al., 2017)). An indicator of successful fluid management in hemodialysis patients is the control of body weight. A rapid increase in body weight may signify a rise in body fluid volume, termed Interdialytic Weight Gain (IDWG). IDWG is a parameter easily measured at the onset of a dialysis session and is crucial for guiding fluid intake recommendations in patients with kidney failure (Murdaningsih et al., 2023). It shows the increment in fluid volume, as evidenced by weight gain, serving to be a baseline for determining fluid intake during the interdialytic period. IDWG is attributed to salt and water intake between consecutive hemodialysis sessions and is used as a parameter for fluid intake, considering daily urine output (Ipema et al., 2016). Elevated IDWG levels are associated with heightened mortality risk (15,16), and the optimal increase in body weight between hemodialysis sessions should not exceed 3% (Bayhakki & Hasneli, 2018).

In order for this hemodialysis procedure to run optimally, it is better if the patient maintains an ideal dry weight, which is the weight when the patient does not have excess fluid in the body. However, patients often fail to maintain an ideal dry weight, one of the causes is compliance in fluid management. in patients with chronic

kidney disease (CKD) undergoing hemodialysis indicates that patients experience significant suffering and sadness due to adherence to fluid restrictions (Mailani et al., 2021). The study emphasizes the importance of adequate compliance for improving patients' quality of life and survival (Putri et al., 2019; Stevenson et al., 2018). Several challenges implicated in poor adherence include nonspecific and inaccurate education and information delivery, which can lead to confusion and personal decisions regarding dietary intake .

Therefore, it is recommended that nurses provide clear information on fluid prescriptions or the exact consumable amount per day. Support from family, friends, and dialysis staff is also a significant factor in promoting acceptance and adherence to fluid restrictions. The study suggests modifying structured education with a personal approach to ensure detailed information regarding "fluid prescribing (Mailani et al., 2021)

The necessity to monitor patients fluid intake arises from the lack of information regarding strategies for restricting fluids (Tovazzi & Mazzoni, 2012). Despite awareness among patients regarding the fatal consequences of unrestricted fluid intake, a significant proportion (59.5%) fail to adhere to recommended fluid intake restrictions (Perdana & Yen, 2021). The provision of effective support consists of supervision, guidance, and attention to patients' responsibilities Coaching methods, which comprise providing information and skill development, serve as an approach to offer such support. The coaching principle shows behavior formation aimed at fostering patients' independence.

Coaching refers to the provision of direction and guidance to attain specific objectives, commonly used to enhance knowledge, attitudes, and skills. This process typically covers five stages, including connect, outcome, awareness, course, and highlights. During the connect stage, the focus is on establishing a relationship with the client through discussions about their life experiences. Subsequently, the outcome stage is dedicated to identifying key topics and the clients' priorities. In the awareness stage, the coach engages in questioning and active listening to facilitate deeper understanding. The course stage aims to determine action with the client, and the Highlights stage is dedicated to reviewing previously learned concepts and experiences(Darby A, 2022).

Table 1. The Main menu of content, strategies and media used of coaching intervention support

Content	Coaching activities	Strategies and Media
Problem Solving	Sharing experience and Obsctacle Fluid Management in hemodialysis patient Goal Setting	Individual discussion
Narrative	Face to face education on fluid management Update information	Face to face education Video Series Modul
Mindfullness based Coaching	Emotional Support Empowering Patient's Achievement Positive Communication	Telephone Consultation
Skill Based Coaching	Face to face training: Assessment Symptom Hyporvolemia fluid management, Dietary Control	Face to face training Video Series Modul
Follow Up	Follow Up IDWG Measurement	Telephone call Face to face Follow

2. Methods

This research used a quasi-experimental design with a pretest-posttest control group. The convenience sampling method and the inclusion criteria were followed in the recruitment of the samples. sample size formulas for paired sample t Test was used to compute the sample size based on the findings of the previous study(Patimah et al., 2015). The sample size was determined to be 28 subjects by taking into account the effect size (β=0.73) and error probability (α<0.05). Two groups of 14 people each—a case group and a control group—were randomly selected from the research units. By using a coin toss to designate the intervention and control groups, odd days were allocated to the control group while even days were the intervention group. The inclusion criteria comprised individuals age ≥ 18 years, receiving hemodialysis for a minimum of six months, receiving hemodialysis at least twice a week, having reading proficiency, and experiencing weight gain exceeding 2 kg. The intervention consisted of coaching sessions conducted over two weeks, with each session lasting 30-45 minutes. IDWG assessments were performed at the first and fourth sessions. Data were analyzed using SPSS software (version 18) and paired t, analysis of covariance and independent t test. Data distribution and homogeneity of variances were investigated by Shapiro-Wilkes. Bivariate analysis included the independent t-test to assess the impact of Coaching Support Program on IDWG scores between intervention and control groups, and the dependent t-test to analyze changes in IDWG before and after therapy within each group.

3. Results and Discussion

Table 2. Characteristics of Respondents and IDWG

No	Respondent Characteristics	Control Group F (%)	Intervention Group F (%)	P-value
1	Gender			
	Men	7 (50%)	4 (28.6%)	0.246*
	Woman	7 (50%)	10 (71.4%)	
2	Age			0.771*
	Mean±SD	47.35±10.1	48,5±10.4	
	(Min-Max)	(32-72)	(33-66)	
	26-25 Years	2 (14.3%)	2 (14.3%)	
	36-45 Years	4 (28.6%)	3 (21.4%)	
	46-55 Years	6 (42.9%)	6 (42.9%)	
	56-65 Years	1 (7.1%)	2 (14.3%)	
	>65 Years	1 (7.1%)	1 (7.1%)	
3	Education			
	Elementary School	3 (21.4%)	5 (35.7%)	0.29*
	Junior High School	4 (28.6%)	4 (28.6%)	
	Senior High School	7 (50%)	1(7.1%)	
	Bachelor	0 (0%)	4 (28.6%)	
4	Work			
	Working	0 (0%)	2 (14.3%)	0.246*
	Not Working	14 (100%)	12 (85.7%)	
5	Long Hemodialysis			
	Mean±SD	28.5±32	58.5±37.1	0.08*
	(Min-Max)	5±120		
	< 12 Months	4 (28.6%)	1 (7.1%)	
	12-24 Months	6 (43.2%)	2(14.3%)	
	>24 Months	4 (28.6%)	11 (78.6%)	
6	Hemodialysis Frequency			
	2x/weeks	14 (100%)	14 (100%)	

Discussion: *=Chi-Square, **=t- test,

Based on Table 2, The characteristics table showed no significant differences between the intervention and control groups in terms of gender, age, education, occupation, duration, and frequency of hemodialysis. In the control group, seven individuals (50%) were female, while in the intervention group, the majority consisted of 10 females (71.4%). Regarding age, approximately half of both groups comprised individuals aged between 46 to 55 years (42.9%). In terms of education, half of the control group had completed high school (50.0%), while nearly half of the intervention group had completed primary school (35.7%). All respondents in the control group were unemployed (100%), whereas in the intervention group, nearly all were unemployed (85.7%). The duration of hemodialysis mostly ranged from 12 to 24 months in the control group (43.2%), while in the intervention group, nearly all had been receiving hemodialysis for more than 24 months (78.6%).

Table 3. Independent T-Test and Dependent T-Test IDWG in the Intervention and Control Groups

Group	Mean±SD		P value
	1st IDWG	2nd IDWG	
Intervention	5.34±1.01	3.95±0.66	0.014*
Control	5.52±0.66	5.85±0.69	0.109*
P value	0.578**	0.000**	

Discussion: *=Dependent T-test, **= Independent t- test

Based on Table 3, the control group had an average IDWG I value of 5.52, ranging from 4.35 to 6.67, and an average IDWG II value of 5.85, ranging from 4.35 to 6.98. Meanwhile, the intervention group had an average IDWG I value of 5.34, ranging from 3.09 to 6.98, and an average IDWG II value of 3.95, ranging from 2.59 to 4.95. The normality test using Shapiro Wilk showed that the data for pre and post IDWG in the intervention group (0.150) with pre-control group IDWG (0.835) and post-control group IDWG (0.659) were normally distributed ($p > 0.05$). The dependent t-test showed a p-value of 0.109 in the control group and a p-value of 0.014 in the intervention group, with a confidence level of 5% (0.05). Consequently, it could be concluded that there was a difference in IDWG in the intervention group, while no difference was observed in IDWG values in the control group.

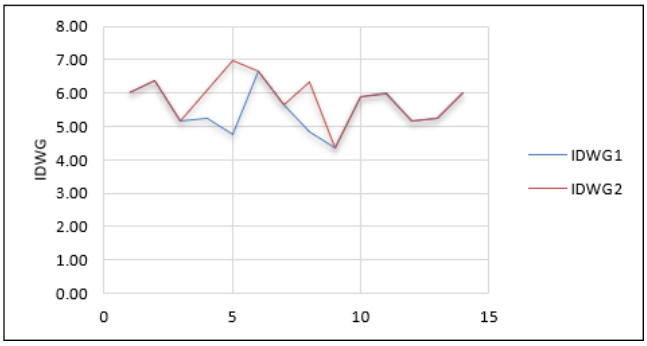

Figure 1. Interdialytic Weight Gain (IDWG) Changes in Control Groups

Fig1. Line Blue depicts the first measurement IDWG and the line Red depicts the second measurement IDWG. in the control group tends to have no change compared to first IDWG, even for some respondents the second IDWG value has increased.

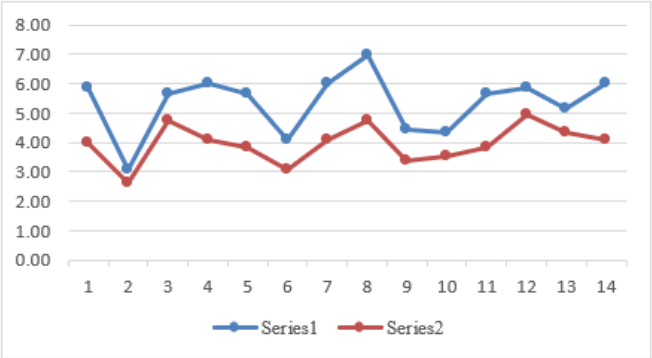

Figure 2. Interdialytic Weight Gain (IDWG) Changes In Intervention Groups

Fig. 2. Line Blue depicts the first measurement IDWG and the line Red depicts the second measurement IDWG . the IDWG 2 value in the intervention group is below the IDWG1 value, which means that the IDWG has decreased compared to the previous IDWG.

The independent t-test yielded a p-value of 0.578 for IDWG 1 and a p-value of 0.000 for IDWG 2, with a confidence level of 5% (0.05). Therefore, it could be concluded that differences in IDWG were observed in both the control and intervention groups after two weeks of coaching. The normality test using Shapiro Wilk showed that the data for pre and post IDWG in the intervention group (0.150) with pre-control group IDWG (0.835) and post-control group IDWG (0.659) were normally distributed ($p > 0.05$). The dependent t-test showed a p-value of 0.109 in the control group and a p-value of 0.014 in the intervention group, with a confidence level of 5% (0.05). Consequently, it could be concluded that there was a difference in IDWG in the intervention group, while no difference was observed in IDWG values in the control group. The independent t-test yielded a p-value of 0.578 for IDWG 1 and a p-value of 0.000 for IDWG 2, with a confidence level of 5% (0.05). Therefore, it could be concluded that differences in IDWG were observed in both the control and intervention groups after two weeks of coaching. the results of the research program supported coaching conducted on CKD patients for two weeks, which had a positive impact on reducing IDWG values, specifically after two weeks compared to the control group.

CKD necessitated comprehensive therapy and long-term care, focusing on specific patients' issues. To manage this chronic condition, the use of knowledge and skills was necessary. Coaching served as a suitable method for enhancing knowledge, attitudes, skills, and quality of life (Gong et al., 2020; Tosif et al., 2020). Additionally, coaching methods represented holistic nursing interventions, supporting the nursing practices that show holistic care such as the interconnectedness of the body, mind, and spirit. Nursing care should have assessed patients response to disease and ability to meet their needs (Asriyani et al., 2021).

Coaching represented an advanced method to assist individuals in managing chronic diseases (Yang et al., 2020). It facilitated the control of modifiable risk factors and adherence to effective self-management treatments related to their current condition (Browning et al., 2011). For CKD patients, coaching interventions assisted in identifying problems, beliefs, and concerns that may have hindered or facilitated lifestyle changes and health

responsibility. The primary objective of coaching was to enable patients to regulate fluid intake according to their kidney function, which was crucial for preserving kidney function and inhibiting disease progression. One of the kidney vital functions was regulating fluid and electrolyte balance. Integrating fluid restriction could alleviate the workload on the kidney to prevent excessive fluid accumulation in the body and lungs (Susanti & Bistara, 2021). Patients receiving hemodialysis commonly encountered physical challenges, with fluid overload being particularly difficult to manage. This was evident from the observed increase in patients' weight between dialysis sessions, known as IDWG. The tolerated increase in IDWG typically ranged from less than 4.0-4.5% of patients dry weight but many patients had IDWG levels exceeding 10-20% (National Kidney Foundation, 2015). In line with this study, (Kelly et al., 2020) discovered that coaching intervention improvements in several exploratory diet and clinical outcomes in the intervention group compared with the control group.

In this research, Coaching Support was administered for two weeks, comprising four sessions for the intervention group. The support coaching process covered four therapeutic steps, including identification of disturbances or issues experienced by patients, categorization based on the conditions or situations encountered, use of family system support, monitoring results and barriers, and evaluation of results and barriers. (Susanti & Bistara, 2021) Coaching represented an educational method to motivate patients and leverage their willingness to adopt lifestyle changes (Conn & Curtain, 2019). Coaching Support Method aimed to enhance self-management skills by empowering patients in healthcare and daily life. Healthcare empowerment consisted of engaging patients in personal decision-making, posing open-ended questions, and furnishing information about CKD. In daily life, patients were more inclined to adhere to treatment plans and embrace lifestyle modifications, thereby effectively managing their chronic conditions.

In coaching principle, emphasis was placed on shaping behavior to empower patients. The results supported Orem theory proposing that nurses should enhance client's self-care abilities and avoid fostering dependency. This showed the importance of nurses empowering clients according to their capabilities and believing in self-care. Nursing care was provided with the belief in individuals ability to meet their life needs, maintain health, and achieve well-being.

From the preceding discussion, it can be concluded that coaching intervention through WhatsApp influenced IDWG values. The use of coaching methods enabled individuals to gain awareness, identify desired changes, and take actionable steps toward achieving those changes. Additionally, follow-up through WhatsApp enhanced patients' motivation to use and adhere to fluid restriction management.

4. Conclusion

The research results were expected to contribute additional insights to the field of medical-surgical nursing regarding interventions for CKD patients receiving hemodialysis. The results were anticipated to guide the development of further interventions aimed at addressing fluid overload more effectively.

ETHICAL APPROVAL

This research received approval from the Ethics Committee of STIKes Karsa Husada Garut Indonesia (ethical code: 088/KEPK-STIKes-KHG/VII/2023). The authors thank Rumah Sakit Dr. Slamet Garut, particularly Hemodialysis Unit, and STIKes Karsa Husada Garut for their collaboration and assistance in conducting this analysis.

AUTHOR CONTRIBUTIONS:

IP: The conceptualization and design of the study SD: Data collection, data analysis and interpretation. AN: Drafting the manuscript, research report. All authors have approved the final version of the manuscript to be published.

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