Self-Efficacy And Compliance Fluid Intake Restriction As A Determinant Of The Interdialytic Weight Gain (IDWG) Level

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Abstract

Higher interdialytic Weight Gain (IDWG) is commonly experienced by patients with chronic kidney disease (CKD). Increased IDWG can cause various complications that result in risk of death. CKD patients who had undergoing hemodialysis in the Public Regional Hospital of Indramayu would have different weight gain, but it is not known what factors affect the increase in IDWG. The purpose of this study was to determine the factors that were significantly related to the IDWG level in CKD patients in the Public Regional Hospital of Indramayu. This research design is descriptive-analytic. The number of samples was 86 respondents who were selected by consecutive sampling technique. Data collection tools are questionnaires and the data analysis technique is the Pearson chi-square test. From the result from 86 respondents, it is known that 44 (51.2%) respondents experienced an increase in IDWG level at the mild category (<4%). It is known that the factor influencing to level of IDWG are self-efficacy (p-value = 0.000; 95% CI) and fluid intake compliance (p-value = 0.042; 95% CI). Meanwhile, age, sex, education level, family support, and duration of hemodialysis are not influencing the IDWG level (p-value > 0,05; 95% CI). Self-efficacy and fluid intake compliance are the most significant factor on the IDWG level in CKD patients who had hemodialization. Patients with high self-efficacy can reduce the IDWG level accompanied by compliance with fluid restriction. Recommendation for hemodialysis nurses needs to increase the patient's self-efficacy in limiting fluid so that can be controlled at the IDWG level.

Keywords: Chronic Kidney Disease, IDWG, Self Efficacy.

Introduction

Chronic Kidney Disease (CKD) is a condition in which the kidneys fail to carry out their functions and are irreversible. The process of decreasing kidney function develops progressively and slowly, lasting for several years (Price & Willson, 2013). This situation causes the body to fail to maintain metabolism and to balance the fluid and electrolytes. This is caused by the progressive destruction of kidney structures.

This disease is usually characterized by the accumulation of fluid and metabolic waste in the body such as water, urea, creatinine, and other metabolic wastes. This condition can threaten the sufferer's life because it can cause death (Smeltzer & Bare, 2015).

The incidence rate of CKD has increased up to 14.8% and is the 9th leading cause of death in the United States (USRDS, 2014). The results of the Riset Kesehatan Dasar (RIKESDAS) data show that there was an increase in the prevalence of chronic kidney disease, which was 0.2% in 2013 up to 3.8% in 2018 (Badan Penelitian dan Pengembangan Kesehatan, 2018). Based on these data, the increase is 3.6%. Other data taken from the Indonesian Renal Registry (IRR) in 2018 states that the number of new CKD patients has doubled compared to 2017, from 30831 to 66433 patients (Indonesia Renal Registry, 2018).

CKD diseases consist of 3 stages. Stage 1 is referred to as the stage of decreased kidney reserves. At this stage, the urine concentration decreased, characterized by polyuria and nocturia occurs. Stage 2 is called the stage of insufficiency and usually has symptoms of kidney disease. And stage 3 is called end-stage renal disease (ESRD). At this stage, the kidneys have reached the stage of requiring renal replacement therapy. There are two types of renal replacement therapy, namely peritoneal dialysis and hemodialysis (DeWit & Kumagai, 2013). Hemodialysis is the treatment method when toxic substances need to be removed from the body quickly through a semi-permeable membrane out of the diffusion, osmosis, and ultra-filtration processes using a device called a dialyzer (Black & Hawk, 2014; Smeltzer & Bare, 2015).

Data were taken from the Indonesian Renal Registry/IRR (2018). states that the number of CKD patients undergone hemodialysis until the end of 2017 was 77,892 people. Meanwhile, there were 30,843 new patients. From the data, not all patients receive hemodialysis therapy, but only 98% who undergone hemodialysis therapy. While the rest did not receive hemodialysis services

CKD patients would experience weight gain problems. Losing kidney function usually causes fluid retention, it affects the accumulation of fluid from daily intake which causes weight gain. The increase in the patient's weight indicates an increase in the amount of fluid retention. By hemodialysis therapy, the patient's weight can be controlled by removing excess fluid through a hemodialysis machine. Weight gain between two times of hemodialysis therapy is called Interdialytic Weight Gain (IDWG). (DeWit & Kumagai, 2013; Black, & Hawk, 2014; Smeltzer dan Bare, 2015)

IDWG is a crucial problem for patients with chronic renal failure. The number of complications caused by IDWG affects a higher risk of death. According to Lewis, Stabler & Welch (2000) in Wayunah, Saefulloh & Aeni, 2016), it is recommended that interdialytic weight gain is not more than 1.5 kg. Meanwhile, according to Price and Wilson (2013), it is stated that the normal increase in IDWG is not more than 2% of dry weight. Furthermore, the excessive IDWG causes symptoms of edema, shortness of breath, and discomfort. An uncontrolled in IDWG can crease mortality and morbidity. As stated by Smeletzer & Bare (2015) explained that patients undergoing hemodialysis must comply with fluid restriction intake. If restrictions are ignored, it can cause complications that can lead to death, due to hyperkalemia and pulmonary edema that can occur.

IDWG can be classified into three categories, namely: addition of <4% is a mild addition, the addition of 4-6% is an average addition, and >6% is a severe addition (Yetti, 2001 in Wayunah, et al, 2016). Based on some research, it is known that many factors can affect the increase in IDWG including age, sex, education level, self-efficacy, fluid intake compliance, family support, and duration of

hemodialysis (Istanti, 2011; Mustikasari & Noorratri, 2017)

Based on information from the Public Regional Hospital of Indramayu, it is known that there are 143 patients undergoing hemodialysis. The results of the observation of weight gain between the two-time increase dialysis were on average in the mild category (< 4%), but many patients also experience excess weight gain, up to more than 6%. The increase in IDWG levels in patients undergoing hemodialysis in Public Regional Hospital of Indramayu varied. The presence of excessive interdialytic weight gain makes the patient come with several complaints, such as edema, shortness of breath, and discomfort. Some patients even have to be hospitalized to improve their health conditions before hemodialysis is carried out. It is not known what factors affect the IDWG level. Therefore, the purpose of this study was to determine what factors were significantly related to IDWG level in CKD patients undergoing hemodialysis in Public Regional Hospital of Indramayu.

Research Method

This research uses analytic descriptive with the cross-sectional approach. The independent variables are internal factors (including age, sex, education level, self-efficacy, and fluid intake compliance). Meanwhile, external factors (including family support and duration of hemodialysis). The dependent variable is the degree of Interdialytic Weight Gain (IDWG) in patients with chronic kidney disease.

The population in this research was 143 patients undergoing hemodialysis. The number of samples obtained was 86 respondents who were selected by consecutive sampling technique. The sample criteria include: willing to be a respondent, able to communicate well, maximum age 60 years, have undergoing hemodialysis therapy for at least 3 months, carry out routine hemodialysis therapy 2 times a week, and the interdialytic weight taken is at the same day interval, which is two days. This research applies ethical clearance which includes 3 principles, they are the principle of benefit, the principle of respecting human rights, and the principle of justice.

The data collection tool used was a questionnaire. The questionnaire used in this study consisted of 5 parts. The first part contains questions about the identity of the respondent, the patients' pre and post-HD weight, duration of hemodialysis, and quick of blood (QB) which consists of 11 questions. The second part is a questionnaire about self-efficacy which consists of 7 questions, using a sematic differential model scale. The third part is a questionnaire on compliance with fluid intake, using a Likert scale consisting of 7 questions. The four-part is a questionnaire about family support using a Likert scale, in this questionnaire, there are 11 questions. And fifth part is an observation sheet about Interdialytic Weight Gain (IDWG). The questionnaire has been tested for validity and reliability and is declared valid and reliable.

While the data analysis techniques included univariate and bivariate analysis. The univariate analysis includes analysis of respondent characteristics, IDWG degrees, self-efficacy, compliance with fluid restrictions, and family support. Bivariate analysis used the Pearson Chi-Square test because the data is in the form of a category.

Results

This research was conducted at hemodialysis room in the Public Regional Hospital of Indramayu, in August 2019 with 86 respondents. The results of his research are as follows:

1. Respondent Characteristic

Respondent characteristic included a description of the respondents' internal and external factors. Based on internal factors (age, sex, education level, occupation, self-efficacy, and compliance with fluid restrictions), can be seen in Table 1 as follows:

Table 1. Frequency Distribution Age, Sex, Education, Occupation, Self-Efficacy, and Fluid Intake

No	Variable	Category	Frequency (F)	Percentage (%)
1	Age	Old (≥43.42 y.o)	46	53,5
		Young (<43.42 y.o)	40	46,5
		Total	86	100
2	Sex	Male	47	54,7
		Female	39	45,3
		Total	86	100
3	Education	Elementary	33	38,4
		Junior High	20	23,3
		Senior High	25	29,1
		University	8	9,3
		Total	86	100
4	Work	Not Work	28	32,6
		Work	58	67,4
		Total	86	100
5	Self Efficacy	High	79	91,9
		Low	7	8,1
		Total	86	100
6	Fluid Intake	Obedient	20	23,3
		Disobedient	66	76,7
		Total	86	100

Based on table 1 above, it is known that the data obtained 46 (53.5%) respondents were in age group old (≥43,42 years old), 47 (54.7%) respondents were male, 33 (38,4%) respondent were education elementary, 58 (67.4%) respondents were employed, 79 (91.9%) respondents had high self-efficacy, and 66 (76.7%) respondents felt disobedient to fluid intake.
Meanwhile, based on external factors (family support, length of hemodialysis, quick of blood, and IDWG degree), can be seen in Table 2 as follows :

Table 2. Frequency Distribution Family Support dan Duration of Hemodialysis

No	Variable	Category	Frequency (F)	Percentage (%)
1	Age	Supportive	22	25,6
		Unsupportive	64	74,4
		Total	86	100
2	Sex	Longer, in months (>17,0)	44	51,2
		Shorter, in months (<17,0)	41	48,8
		Total	86	100
3	Education	< 200 ml/minute	12	14,0
		200-249 ml/minute	69	80,2
		≥ 250 ml/minute	5	5,8
		Total	86	100

Based on table 2 above, it is known that the data obtained 64 (74.4%) respondents felt that their families were not supportive in maintaining incoming fluids and food, 44 (51.2%) respondents

had >17 months undergone HD and 69 (80,2 %) with quick of blood at 200 – 249 ml/minute. The frequency distribution of IDWG degrees can be seen in Table 3 as follows:

Table 3. Frequency Distribution of Respondents Based on Interdialytic Weight Gain (IDWG) Degrees

No.	IDWG Category	Frequency (F)	Percentage (%)
1	Mild (<4%)	45	52.3
2	Average (4%-6%)	22	25.6
3	Hazard (>6%)	19	22.1
	Total	86	100.0

Based on table 3 above, it is known that 45 (52.3%) respondents were at a mild degree of IDWG (<4%).

2. Factors Associated with IDWG

Factors related to the IDWG level studied included age, sex, education level, self-efficacy, fluid intake compliance, family support, and duration of hemodialysis. The results can be seen in Table 4 as follows:

Table 4. Analysis Factors Influencing to Level of Interdialytic Weight Gain to CKD Patients

Variable	Category	Categoty_IDWG								P Value (α = 0,05)
		Mild <4%		Average 4%-6%		Severe >6%		∑		
		N	%	N	%	N	%	N	%	
Age	>43,42 y.o	24	52,2	12	26,1	10	21,7	46	100	0,992
	<43,42 y.o	21	52,5	10	25,0	9	22,5	40	100	
Sex	Male	24	51,1	13	27,7	10	21,3	47	100	0,888
	Female	21	53,8	9	23,1	9	23,1	39	100	
Education	Elementary	17	51,5	9	27,3	7	21,2	33	100	0,806
	Junior High	12	60,0	5	25,0	3	15,0	20	100	
	Senior High	12	48,0	5	20,0	8	32,0	25	100	
	University	3	37,5	4	50,0	1	12,5	8	100	
Self Efficacy	High	44	60,3	20	27,4	9	12,3	73	100	0,000 *
	Low	1	7,7	2	15,4	10	76,9	13	100	
Fluid Intake	Obedient	15	75,0	4	20,0	1	5,0	20	100	0,042 *
	Disobedient	30	45,5	18	27,3	18	27,3	66	100	
Family	Supportive	14	63,6	7	31,8	1	13,6	22	100	0,071
	Unsupportive	21	48,4	15	23,4	18	28,1	64	100	
Duration of Hemodialysis	Longer, in months (>17,0)	23	54,8	10	23,8	9	21,4	44	100	0,900
	Shorter, in months (<17,0)	20	50,0	12	27,3	10	22,7	42	100	

The age factor, knowing that 46 respondents aged > 43,42 years old, 24 (52.2%) respondents had a mild IDWG level (4% increase). The results of further analysis obtained that p-value = 0.992 (p-value > 0.05), meaning that there was no relationship between the age factor and the IDWG level.

The sex factor, known from 47 male respondents, 24 (51.1%) respondents had a mild IDWG level (increase <4%). The results of further analysis obtained that p-value = 0.888 (p-value > 0.05), meaning that there was no relationship between the sex factor and the IDWG level.

The education level factor, known from 33 respondents with elementary school education, 17 (51.5%) respondents had mild IDWG level (increase <4%). The results of further analysis obtained that p-value = 0.806 (p-value > 0.05), meaning that there was no relationship between the education level factor and the IDWG level.

The self-efficacy factor, known from 13 respondents who have self-efficacy in the low category, 10 (76,9 %) respondents had a severe IDWG level (increase >6%). The results of further analysis obtained that p-value = 0.000 (p-value <0.05), meaning that there was a relationship between the self-efficacy factor and the IDWG level.

The fluid intake compliance factor, known from 20 respondents who are obedient to fluid restriction, 15 (75,0%) respondents had mild IDWG level (<4% increase). The results of further analysis obtained that p-value = 0.042 (p-value > 0.05), meaning that there was a relationship between the fluid intake compliance factor and the IDWG level

The family support factors, known from 20 respondents who did receive family support in fluid restriction, 14 (63,6%) respondents had a mild IDWG level (increase <4%). The results of further analysis obtained that p-value = 0.071 (p-value > 0.05), meaning that there is no relationship between family support factors and the IDWG level.

The length of time on hemodialysis, known from 44 respondents who undergone hemodialysis first category (≥17.0 months), 23 (54.8%) respondents had mild IDWG level (<4% increase). The results of the further analysis can be seen that the p-value = 0.900 (p-value > 0.05), meaning that there was no relationship between the length of time on hemodialysis and the IDWG level.

Based on the results of the analysis above, it is known that the factors associated with IDWG are self-efficacy and fluid intake compliance (p-value < 0,05). However, self-efficacy is the most significant factor affecting IDWG, with a p-value = 0,000.

Discussion

IDWG is considered as a measure of patient compliance in undergoing hemodialysis therapy. Restriction of fluid intake is a difficult aspect for most patients. Several studies mention the factors that influence the compliance of chronic kidney disease patients in maintaining IDWG are patient knowledge, social support, and self-efficacy (Wayunah, et al, 2016).

Theoretically, age will affect a person's mindset in following a therapy program. However, based on the results of the study, it shows that there was no relationship between the age factor and IDWG level (p-value = 0.992; p-value > 0.05). It later shows that the age factor is not a determining IDWG level. The results of this research are similar to those by Mustikasari & Noorratri (2017) which states that there is no relationship between the age factor and IDWG (p-value = 0.47). However, based on the results of research conducted by Ipema, et al (2016) found that the factor most related to IDWG one of which is the age factor (p-value = 0,004), where younger ages have a higher tendency for IDWG than old age.

An increase in IDWG can occur at any age. It is usually associated with compliance in fluid intake regulation. Older people are not necessarily obedient to a fluid restriction if they are not supported by high knowledge and motivation in carrying out therapy programs.

Based on the sex factor, it shows that there is no relationship between the sex factor and the degree of interdialytic weight gain p-value = 0.888 (p-value > 0.05). It shows that the risk factor for sex is not a determining factor for IDWG. The result of this research is similar to those conducted by Istanti (2011) who concluded that there was no relationship between sex and IDWG (p-value > 0.05). The

results of this study indicate that an increase in IDWG can occur in all sexes, both male and female.

Based on the education level factor, it is known that there is no relationship between the education level factor and the IDWG level p-value = 0.806 (p-value > 0.05). It is similar to those conducted by Mustikasari & Noorratri (2017), who that mention the education level factor does not affect IDWG. This shows that the change in IDWG is not influenced by education level. Based on the results of the research, it can be seen that both high and low education levels have the same distribution to IDWG level from mild to hazard.

The self-efficacy factor is categorized into high and low. The higher the self-efficacy of the patient, the more awareness of the patient to carry out self-management increasingly. These results indicate that almost all respondents already have high confidence to control IDWG. In line with research conducted by Purba, Emaliyawati & Sriati (2018), it is stated that in general patients undergoing hemodialysis already have good self-management and self-efficacy. However, still need to be improved strategies, to improve self-management and self-efficacy in patients, especially in the caring aspect by providing emotional support between nurses and patients.

The results showed that p-value = 0.000 at (α 5%), meaning that there was a relationship between self-efficacy and the IDWG level in CKD patients at the hemodialysis room in Public Regional Hospital of Indramayu. It also shows that self-efficacy is a determinant factor for increasing IDWG levels in CKD patients who have undergone hemodialysis therapy. Based on the results of the study showed that self-efficacy is a determinant factor for increasing IDWG in CKD Patients undergoing hemodialysis therapy. It is known that patients who have high self-efficacy express confidence in being able to manage fluid intake, thirst, and can manage activities so that there is no tendency for patients to drink. Patients with good beliefs can motivate to behave as recommended so that the increase in IDWG can be controlled.

It is similar to that conducted by Wayunah (2016) who examined the relationship between self-efficacy and IDWG level, where the results were known that self-efficacy was influenced to IDWG (p-Value = 0.000). Also, the result of research by Wahyuni, Haloho, Asmoro & Laili (2019) said that self-efficacy has a significant relationship with an increase in IDWG (p-value = 0,035), where high self-efficacy will increase the patient's motivation to comply with therapy. In addition, with high self-efficacy, it will carry out good control in therapy management so that it can prevent an increase in IDWG.

Bandura (1994) defines self-efficacy as a belief about the ability to carry out certain activities that will affect his life. Self-efficacy will determine how a person feels, thinks, and motivates himself to act and behave. Someone who has high self-efficacy can create a constructive situation so that they can assess each situation and condition with a positive assessment.

Based on fluid intake compliance factors, the results showed that there was a relationship between fluid intake compliance factors and the degree of interdialytic weight gain p-value = 0.042 (p-value > 0.05). This shows that patient compliance with fluid restriction has been shown to reduce IDWG levels. In this research, both respondents who complied and did not comply with fluid restrictions had mild IDWG category. Whereas in theory, IDWG should be closely influenced by fluid intake.

This result is similar to the research conducted by Wahyuni, et al (2019) which found that there was a significant relationship between fluid intake and IDWG (p-value = 0,006). And this research explained that patients with excessive fluid intake tended to experience an increase in IDWG in the mild to severe category. Also, a similar study conducted by Istanti (2011) found that there was a significant relationship between fluid and IDWG (p-value = 0,000).

Fluid intake is an important factor that needs to be considered by hemodialysis patients given the effect of uremia due to failure of kidney function in maintaining fluid and electrolyte balance. The amount of fluid consumed by the patient every day is adjusted to the renal function, the presence of edema, and the patient's urine output. Good fluid intake settings can prevent complications that

can worsen the patient's condition so patients need to limit the amount of fluid intake according to recommended diet (Smeltzer & Bare, 2015; Black & Hawks, 2014).

Family support is needed because CKD patients will experience several changes in their lives so it eliminates the patients' enthusiasm for life. It is hoped that family members can support patients' compliance. Family support refers to deeds that are seen as something that can be provided. Internal Family support can be in the form of support from husband or wife, support from children, and support from siblings. External Family support such as support from friends, neighbors, schools, extended family, places of worship, health practitioners (Friedman, 2010).

Based on family support factors, it shows that there is no relationship between family support factors and the IDWG level (p-value = 0.520; > 0.05). It shows that family support is not a determining factor for IDWG level.

The result shows that there was no relationship between the length of time on hemodialysis and the level of interdialytic weight gain p-value = 0.813 (p-value > 0.05). The results of this study are similar to those conducted by Bayhakki & Hasneli (2018) which showed that there was no relationship between the length of time undergoing hemodialysis and IDWG in hemodialysis patients at Dumai Hospital (p-value = 0.952). It was found that there was no difference in the level of IDWG between patients who had just undergone hemodialysis (shorter therapy) and those who had undergone hemodialysis for a long time (longer therapy). The longer a person undergoes hemodialysis, the more able to adapt to the conditions and side effects of hemodialysis so that patients remain motivated to always comply and undergo hemodialysis therapy so it does not cause an increase in fluid accumulation.

Hemodialized patients need high support from health workers, especially nurses in maintaining the increased IDWG level. According to Kustimah, Siswandi, Djunaidi & Iskandarsyah (2020), it is explained that CKD patients undergoing hemodialysis will experience physical and mental disorders due to their illness which can limit patients''' from doing their activities. By limiting the increase in IDWG level, it can help reduce the burden on patients due to their disease. Therefore, nurses must remind patients to comply with fluid restrictions so that they do not experience an increase in IDWG exceeding the standard.

Conclusion

Self-efficacy and fluid intake compliance are factors that are significantly related to the IDWG level. Meanwhile, the factors of age, gender, education, family support, and duration of hemodialysis were shown to be unrelated to IDWG. Patients with high self-efficacy can reduce the IDWG level coupled with compliance with fluid intake restriction. Suggestion for hemodialysis nurses needs to increase the strengthening of self-efficacy patient's in fluid restriction so that the level of IDWG can be controlled.

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