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Relation Interdialytic Weight Gain (IDWG) Score and Adherence Dietary Restriction with Restless Legs Syndrome Symptoms for Hemodialysis Patient

Hubungan Interdialytic Weight Gain (IDWG) *Score dan Kepatuhan* Dietary Restriction *dengan Gejala* Restless Legs Syndrome *pada Pasien Hemodialisa*

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Abstract

Objective: This study aims to analyze and determine the relationship between the Intradialytic Weight Gain (IDWG) value and adherence to dietary restrictions on the occurrence of Restless Legs Syndrome in patients undergoing hemodialysis at the HD Clinic Apotik Berkat Pangkal Pinang in 2020.

Methods: This research is a descriptive analytic study with a cross sectional approach. This study involved 28 hemodialysis patients at the HD Clinic Apotik Berkat Pangkal Pinang as respondents.

Results: The study results with the Chi-Square analysis obtained a p-value for IDWG was 0.006, and a p-value of 0.030 for dietary restrictions. Patients adhering to dietary restrictions would minimize the increase in IDWG values and reduce the impact of RLS. Suggestions that could be given based on this study were expected to improve compliance with dietary and fluid restrictions in HD patients so that complaints of RLS were reduced.

Conclusion: This study ultimately concluded that there was a relationship between IDWG scores and dietary restriction compliance with the occurrence of RLS.

Keywords: Interdialytic Weight Gain, adherence dietary restriction, restless legs syndrome, hemodialysis patient

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Introduction

According to World Health Organization (WHO) data, chronic kidney disease and urinary tract have contributed to 850,000 deaths each year. This proves that chronic kidney disease ranks the 12th highest in the mortality rate or the 17th in the disability rate, 2015 WHO estimated that as many as 36 million people in the world die from chronic kidney disease[1] and based on reports of the United State Renal Disease Data System (USRDS) in the United States, the prevalence of chronic kidney disease increases by 20-25% each year. The United States Renal Data System (USRDS) records 100,000 new patients annually in America. The condition is also currently happening in Indonesia. In Indonesia, chronic kidney disease is among the top 10 chronic diseases. The Indonesian Nephrology Association (PERNEFRI) reports that every year there are 200,000 new cases of end-stage CKD[2].

The estimated prevalence in Southeast Asia in 2025 will reach more than 380 million people, influenced by population growth factors, increased aging processes, urbanization, obesity, and unhealthy lifestyles. Based on annual report data from the Indonesian Nephrology Association, Data in the National Kidney and Urologic Disease Information Clearinghouse (NKUDIC, 2012) shows that the incidence of ESRD in Asian tribes has continued to increase from 1980 to 2009 and ranks third in terms of the ratio incidence of 400 per million population. Whereas in Indonesia in 2011, there were 15,353 new patients undergoing hemodialysis, and in 2012, there was an increase in patients undergoing hemodialysis, including 4,268 people, so that in total, there were 19,621 new patients undergoing hemodialysis by the end of 2012 in 244 hemodialysis units in Indonesia (Indonesian Renal Registry / IRR), 2013[3]. Hemodialysis procedures cause complications; one of the complications arising from hemodialysis is Restless Legs Syndrome.

Currently, Restless Legs Syndrome is one of the problems experienced by hemodialysis patients; where Restless Legs Syndrome is a general sensory-motor neurological disorder characterized by intense anxiety and uncomfortable sensations in the extremities which are more common in patients with chronic kidney disease than with other populations, the prevalence in hemodialysis patients shows 20-80% and some studies also show that 33% of End Stage Renal Disease (ESRD) patients experience RLS. RLS is a sensorimotor disorder characterized by uncomfortable conditions on the feet

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with symptoms in the form of aches and pains, a burning sensation, spreading in nature, twitching in the legs, itching, tingling, and cramps in the leg muscles[4]. And, tnumber of hemodialysis patients who experienced RLS was 40% of 235 respondents. RLS can be minimized by keeping the IDWG value.

Interdialytic Body Weight Gain (IDWG) is an increase in the amount of fluid that causes weight gain as a basis for knowing the amount of fluid intake during the interdialytic period[5]. The problems experienced by patients undergoing hemodialysis therapy are related to their non-compliance in limiting fluid and food intake. In the United States, 9.7% - 49.5% of patients undergoing HD experienced weight gain (IDWG). In Europe, as many as 9.8% - 70% of hemodialysis patients experienced an increase in IDWG[6]. The rise in IDWG was due to the non-compliance of kidney failure patients in maintaining their diet, which can lead to excess bodily fluid.

On this basis, the ability of hemodialysis patients to maintain a normal IDWG must be influenced by patient compliance in maintaining body weight under dietary restrictions. Therefore, adherence to dietary restrictions is one of the factors that can minimize hemodialysis complications[7]. Thus, this study attempts to examine the relationship between the Intradialytic Weight Gain (IDWG) value and adherence to dietary restrictions on the occurrence of Restless Legs Syndrome in patients undergoing hemodialysis at the HD Clinic Apotik Berkat Pangkal Pinang.

Methods

Research Design

The research design used is descriptive-analytic, which systematically describes essential events happening in the present and places more emphasis on factual data than conclusions[8]. This study uses a cross-sectional approach, a type of research that emphasizes the time of measurement of independent and dependent variable data only once[9].

Population

The population in this study were patients with end-stage chronic kidney disease who were undergoing a hemodialysis program in the Bangka Belitung region and had been selected by the HD Clinic at the Blessing Pharmacy, Pangkal Pinang. The population

as a result of a preliminary study at the Blessing Pharmacy HD Clinic in April 2020, it is known that temporary data for patients undergoing hemodialysis is 28 people.

Time and Place

This research was conducted from April to June 2020 at the Bangka Belitung Apotik HD Clinic in Pangkal Pinang, the choice of this location was because the clinic is a referral for people in the Bangka Belitung region who provide hemodialysis therapy.

Research Ethics

After obtaining approval, research information is conveyed to respondents, who will be examined by applying research ethics to conduct this research. The ethical principles applied are Autonomy, Confidentiality, and Non-Maleficience.

Data Collection Tools and Procedures

The measurement tool used in this study is to use an instrument in the form of a questionnaire. The procedure for collecting research data was carried out in 3 stages: "preparatory stage, implementation stage, and termination."

Data processing

This study has four stages of data processing carried out in the form of editing, coding, processing, and cleaning.

Data Analysis

Data analysis uses a computerized data analysis program, namely univariate analysis, to get an overview of the frequency distribution of the respondents' demographic data and each independent and dependent variable and then interpreted—and Bivariate Analysis combines two related variables and gets the p-value results from the two related variables.

Results

Univariate Analysis

Univariate analysis in this study describes the characteristics of each variable in the demographic data of respondents, namely based on age, gender, education, occupation, and duration of hemodialysis. In addition, the univariate analysis also described the characteristics of the independent and dependent variables, namely IDWG

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values, adherence to dietary restrictions, and RLS. The following data results from this univariate analysis:

Frequency Distribution of Respondents Based on Demographic Data Characteristics

Table 1. Frequency Distribution of Respondents Based on Demographic Data at the Bangkal Pinang Pharmacy Hemodialysis Clinic in 2020, (n=26)

Variables	Frequencies	(%)
Age		
Minimal	32 years	
Maximal	79 years	
Sex		
Male	6	23.1
Female	**20**	**76.9**
Education		
SD	**12**	**46.2**
SMP	6	23.1
SMA	5	19.2
College	3	11.5
Work		
Yes	4	15.4
No	**22**	**84.6**
HD Duration		
<1 year	**7**	26.9
1-3 years	**11**	**42.3**
>3th years	8	30.8

Source: processed data

In table 1 above, it is shown that the majority of respondents in this study were women (76.9%) with the maximum age having primary school education (46.2%) and not working (84.6%), and experiencing 1- 3 years old HD (42.3%).

Frequency Distribution of Respondents Based on Independent Variables

Table 2. Frequency Distribution of Respondents Based on Independent Variables (n=26)

Variable	Frequencies	(%)
IDWG Value		
Lenient rise	12	46.2

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Moderate rise	**14**	**53.8**
Kepatuhan Diet		
Not comply	**18**	**69.2**
Comply	8	30,8

Source: processed data

Based on table 2, it can be seen that the majority of respondents experienced a moderate-to-severe increase (53.8%). Whereas in terms of dietary compliance, the majority of respondents did not comply as many as 18 respondents (69.2%) did not comply (69.2%).

Frequency Distribution of Respondents Based on the Dependent Variable

Table 3. Frequency Distribution of Respondents Based on the Dependent Variable (n=26)

Variable	Frekuensi	Presentase (%)
Kategori RLS		
Tidak dirasakan	13	50.0
Dirasakan	13	50.0

Source: processed data

Table 3 shows that the two groups, whether perceived or not, have the same percentage (50.0%).

Bivariate Analysis

Relationship between Interdialytic Weight Gain Value and Restless Legs Syndrome

Tabel 4. Frequency Distribution of Respondents Based on IDWG and RLS Values in Patients (n=26)

	RLS events								
IDWG value	**Not felt**		**felt**		**Total**		**OR**	**95% CI**	**P Value**
	N	**%**	**N**	**%**	**N**	**%**			
Lenient rise	10	83.3	2	16.7	12	100	18.333	2.522 - 133.260	0.006
Moderate rise	3	26.7	11	78.6	14	100			
Total	13	50.0	13	50.0	26	100			

Source: processed data

Based on table 4 above, it can be concluded that most respondents were respondents with a moderate increase and felt RLS totaling 11 respondents with a percentage (78.6%).

The statistical test results obtained p value = 0.006 < α 0.05), so it can be concluded that there is a significant relationship between the IDWG value and the incidence of RLS in patients undergoing hemodialysis at the Blessing Pharmacy HD Clinic, Pangkal Pinang. From the analysis results, OR = 18,333 was also obtained, which means that patients with moderate to severe increases in IDWG values have an 18,333 times higher risk of experiencing RLS compared to patients with mild increases in IDWG values.

Relationship of Compliance with Dietary Restrictions to the Occurrence of Restless Legs Syndrome

Table 5. Frequency Distribution of Respondents Based on Compliance with Dietary Restrictions and RLS in Patients, (n=26)

Dietary Restriction Compliance	RLS events						OR	95% CI	P Value
	Not felt		felt		Total				
	N	%	N	%	N	%			
Not comply	6	33.3	12	66.7	18	100	0.071	0.007 - 0.722	0.030
Comply	7	87.5	1	12.5	8	100			
Total	13	50.0	13	50.0	26	100			

Source: processed data

Based on table 5 above, it can be concluded that the highest number of respondents were non-compliant, and 18 respondents felt RLS with a percentage of 67.7%. While the results of statistical tests obtained p value = 0.030 < α 0.05), it was concluded that there was a significant relationship between adherence to dietary restrictions and the incidence of RLS in patients undergoing hemodialysis at the Blessing Pharmacy HD Clinic, Pangkal Pinang. From the analysis results, the value of OR = 0.071 was also obtained, which means that patients with non-adherent adherence to dietary restrictions have a 0.071 times higher risk of experiencing RLS than patients who adhere to adherent dietary restrictions.

Discussion

The results of the study showed that the analysis of the relationship between the IDWG value and the incidence of RLS in patients undergoing hemodialysis showed that 11 respondents (78.6%) experienced an increase in moderate-severe IDWG values.

The statistical test results obtained p value = 0.006 < α 0.05), so it can be concluded that there is a significant relationship between the IDWG value and the incidence of RLS in patients undergoing hemodialysis at the Blessing Pharmacy HD

Clinic, Pangkal Pinang. From the analysis results, the OR value = 18,333 means that patients with moderate to severe increases in IDWG values have an 18,333 times higher risk of experiencing RLS than patients with mild increases in IDWG values.

Until now, the cause of RLS is unknown; most of them refer to idiopathic conditions, which means that the cause of RLS is unknown[10]. According to research conducted by Salman YS entitled "Restless Legs Syndrome in Patients On Hemodialysis,"[11] said that the pathophysiological relationship between RLS events and chronic kidney failure is still unclear. Still, previous hypotheses said that anemia plays a significant role in developing uremic, a body condition. The inability to maintain metabolism and fluid and electrolyte balance cause uremia[12].

This is also in line with research conducted by Rahayu G et al.[13] with the title "Relationship of Urea Levels to Restless Legs Syndrome in Chronic Kidney Disease Patients," where there is a relationship between urea levels and the Restless Legs Syndrome scale, which means that the higher the urea level, the larger scale of RLS the more severe the perceived RLS.

On the other hand, from the results of the second analysis, from the results of the study, it was found that the results of the analysis of the relationship between Compliance with Dietary Restrictions and RLS Incidents obtained the results of respondents who were not compliant and felt RLS by 12 respondents (66.7%).

Statistical test results obtained p value = 0.030 < α 0.05), so it can be concluded that there is a significant relationship between adherence to dietary restrictions and the incidence of RLS in patients undergoing hemodialysis at the Blessing Pharmacy HD Clinic, Pangkal Pinang. The results of the analysis also obtained an OR value = 0.071, which means that patients with adherence to dietary restrictions are not adherent to having a 0.071 times higher risk of experiencing RLS than patients who are adherent to adherent dietary restrictions.

This is to Smeltzer's theory (2002) compliance is a description of behavior that shows changed behavior. The compliance is non-compliance (non-compliance/nonadherence) to a treatment plan related to complexity, cost, duration, boredom, cultural influences, health beliefs, motivational strength, and spiritual values. Complex treatment regimens will make clients more non-compliant (Renal Rehabilitation Report, 2007).

Compliance is patient obedience in carrying out therapeutic measures. Patient compliance means patients and families must take the time to undergo the necessary treatment. One of the critical factors in the management of CRF patients undergoing hemodialysis is diet. Diet depends on the frequency of dialysis, residual kidney function, and body weight measures. Diet regulation aims to avoid the accumulation of waste products of protein metabolism, maintain fluid and electrolyte balance and meet nutritional needs to achieve optimal nutritional status[14].

Generally, RLS in patients undergoing hemodialysis is associated with a decrease in iron in the patient's body when undergoing hemodialysis, in which iron is absorbed through food which is then digested by the digestive tract[15]. A decrease in iron can result in a reduction of dopamine in the extrapyramidal lot, which ends in motor disturbances, besides that iron also plays a role in regulating glutamate reproduction, which production will increase in patients with iron deficiency anemia[16,17].

Disruption of dopamine and glutamate production will cause sensorimotor abnormalities according to the location affected, which will later cause several symptoms such as the desire to move the legs, itching, pain, itching, cramps which will cause a syndrome, namely Restless Legs Syndrome[17].

Conclusion

This study ultimately concluded that there was a relationship between IDWG scores and dietary restriction compliance with the occurrence of RLS. There is a significant relationship between IDWG values and the incidence of RLS in patients undergoing hemodialysis. The analysis showed that patients with moderate to severe increases in IDWG values had an 18,333 times higher risk of experiencing RLS than patients with mild increases in IDWG values. On the other hand, we get an overview of the relationship between adherence to dietary restrictions and the occurrence of RLS. Also, there is a significant relationship between adherence to dietary restrictions and the incidence of RLS in patients undergoing hemodialysis. The analysis also showed that non-adherent commitment to dietary restrictions had a 0.071 times higher risk of experiencing RLS than patients who adhered to adherent dietary restrictions.

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