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Correlation between Compliance of Protein Diet and Clinical Symptoms among Patients with Chronic Kidney Disease Who Are Undergoing Hemodialysis

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Abstract

The compliance of protein diet of CKD patient is undergoing hemodialysis has an important role in reducing the kidney works and maintaining the weight. The symptoms will emerge due to the patients inability to processing the metabolism waste as the organ failure. An effort to reduce those symptoms is by dieting. The objective of this research is to find out the correlation between compliance of protein diet and clinical symptoms among patients with CKD who are underging hemodialysis. Method used a quantitative correlation with *cross sectional* approach, was conducted involving 90 people as respondents. A convenience sampling has been used to recruit the participan. The compliance of protein diet measured by *food record* and the clinical symptoms measured by Dialysis Symptom Index (DSI). The result of this research showed that 76,7% of respondents are categorized as non-compliance to the protein diet and 85,6% of the respondents categorized as feeling the reaction of the clinical symptoms. there is poor correlation between the compliance of protein diet and the clinical symptoms with *p-value* 0.010 ($p<0.05$) with value correlation coefficient (+0,284). This study shows most of patients not following the diet and result in the clinical symptoms burden, better understanding of factors that contribute to clinical symptoms need to be developed to improve patients outcomes.

Keywords: Clinical symptoms, Hemodialysis, Compliance of protein diet

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1. Introduction

Chronic Kidney Disease (CKD) is a situation when the work of kidney progressively and irreversibly decreased, when the kidney cannot balance the metabolic, fluid, and electrolyte together it could be causing uremia dan azotemia [1]. According to Infodatin (2017), about 1 of 10 global population has CKD in certain stages, and the result of the *systematic review* and metanalysis have done by Hill *et al*, 2016 resulted in 13,4% of CKD global prevalence. Prevalence of people with ESRD undergoing hemodialysis in Indonesia was 19,3%[2]. West Java is one of provinces that has sent the most data of

hemodialysis patients that consists of new patients as many as 7.444 and active patients as many as 21.051 [3].

As Aisara et al. (2018) [4] points out, in their research showed clinical symptoms that happens to the most of CKD patients who are under hemodialysis treatment such as feeling weak, tired, sluggish (30,8%), nausea (12,5%), vomiting (7,7%), losing appetite (13,5%), insomnia (11,5%) and ithching (1%). Diet is an effort that could be done by someone with restriction and control the foods to decrease the work of kidney and to maintain the weight [5]. NKF-K/DOQI (2000), recommend protein diet 1-1,2 gram/kg weight/day to the CKD patients who are under hemodialysis treatment. According to louis [6] research, expressed that about 50% patients consume protein less than needed. Low protein intake will cause mass muscle to decreased [5]. Patients who are under hemodialysis treatment need high protein intake because it is used to maintaining the conditions when dialysis is held. Yet if the protein intake is more than what is needed then it will cause the urea levels to increase. The protein intake that is lower than what is needed will have high risk at protein malnutrition. Malnutrition that happens to the hemodialysis patients is increasing risk at morbidity and mortality [7]. As stated by WHO (2003) in Relawati [8], expressed that compliance means that patients and their family have to take time to do the treatment the patient needed.

A research done by Yulia et al. [9], resulted that category that is non-compliance is more than the compliance category that is 53.1% and who have felt the symptoms of uremia as many as 89.1%. Also the research done by Stevenson et al. [10], resulted most of the (51%) patients feel better when they diet that has been recommended and see improvement of the symptoms such as itchy, not able to breath good and energy increased. Data about the compliance of protein diet with clinical symptoms of the CKD patients who are under hemodialysis treatment in Indonesia is not many yet available. So, the objective of this research is to see the correlation between the compliance of protein diet and clinical symptoms of CKD patients who are under hemodialysis treatment.

2. Methods

2.1. Study design

This research is a quantitative correlation that used cross sectional approach. This research is held in Dustira Stage 2 Hospital Cimahi.

2.2. Sample

Population in this research is CKD patients who are under Hemodialysis treatment. The researchers use *convenience sampling*. Inclusion Criteria used in this research is patients who are in a good condition, composmentic, and stable, able to do verbal, aged >17 years old, and capable to be respondents. Though there are exclusion criteria in this research, patients who suffer other diseases that interfere the measure also the interpretation results such as mental disorders. Sample size count by *G*Power Software* 3.1.9.2. using *t test* and *statistical test* that is *correlation point biserial model* by assumption α=0.05, *medium effect size*=0.3, *power level*= 0.8. The total of sample size are 82 patients. Yet to avoid failure, 10% of the sample is added so the total sample recruited in this research is 90 patients.

2.3. Instrument

Instrument used to measure the protein diet compliance is *food record* as long as 3x24 hours and to measure the clinical symptoms use Dialysis Symptom Index (DSI) that consist of 30 questions, each of it explains physical symptoms and certain emotional (Weisbord et al., 2004).

2.4. Data collection procedure

Permission to carry out the research was obtained from the west java STIKep PPNI and had received permission from the hospital concerned. Researchers look for respondents according to predetermined criteria. Patients who met the criteria were given an explanation of the purpose of the study and were asked to fill out a informed consent, than fill out the questionnaire to fill out the food record questionnaire for 3 days and brought home. After the respondents filled out all the questionnaires, the questionnaire was handed back to the researchers.

2.5. Data analysis

The analysis of this research is univariate analysis to discover variable distribution observed and bivariate analysis to discover the correlation between protein diet compliance and clinical symptoms that happens to CKD patients who are under hemodialysis treatment using *chi square* test. As doing this research, researchers pay attention to

ethical issues such as: *Informed Consent, Non-Maleficence, Confidentiality, Veracity,* dan *Justice.*

3. Results

The results from the research that have been done include frequency distribution of respondent characteristics, protein intake, protein diet compliance, clinical symptoms, and the relationship of protein diet compliance with clinical symptoms are as follows:

Table 1: Respondent Characteristics.

Characteristics	Frequency (n)	Percentage (%)
Gender		
Man	46	51,1
Woman	44	48,9
Age		
< 40	20	22,2
40 – 60	55	61,1
> 60	15	16,7
Hemodialysis Period		
< 12 months	34	37,8
12 – 24 months	17	18,9
> 24 months	39	43,3
Total	90	100,0%

According to the data above showed more than half of men respondents (51,1%). According to the age obtained that more than half of the respondents aged 40-60 years (61,1%) and less than half of respondents are categorized as long time period of hemodialysis that is > 24 months (43,3%).

Table 2: Description of Respondents Protein Intake.

Category	Dry weight average	Intake average	Intake		
			Mean ± SD	Min.	Max.
Protein Intake (gram/day)	57	62,7	45,93 ± 17,77	12,3	93,5

According to the data above showed that dry weight average is 57 kg as the protein intake needs is in the average 62,7 g/day, for average protein intake 45,93 g/day also the highest intake is 93,5 g/day.

According the data above showed that most of the respondents is in non-compliance category as many as (76,7%).

Table 3: Description of Protein Diet Compliance.

Protein Diet Compliance	Frequency (n)	Percentage (%)
Compliance	21	23,3
Non-compliance	69	76,7
Total	90	100,0%

Based on the data above showed that most of the respondents are in the category of the symptoms felt by (85,6%) and more than half of the respondents complain about the itch symptoms by (56,7%). The average of the symptoms felt is 5,24 by 4,959 deviation standard and the number of the lowest symptoms is 0 also the number of the highest symptoms is 25. The average of severe or dialysis symptom burden is 9,79 and the standard deviation is 12,549 with total of burden of the symptoms is 0 also the highest is 80.

Based on the data above showed that there is correlation between the compliance of protein diet and clinical symptoms by the *p-value* $0{,}010 < p < 0.05$. The closure test results in contingency coefficient point (+0,284) means that correlation between the compliance of the protein diet and clinical symptoms have poor closure. Positive correlation means that the correlation between the compliance of the protein diet and clinical symptoms have poor closure.

4. Discussion

This study shows that more men than women are associated with poor lifestyle such as smoking, drinking alcohol, staying up late, drinking less water, lack of exercise, and irregular eating patterns [11]. The results of research that have been done show that the intake of protein consumed by respondents is less than necessary, the lack of protein intake in hemodialysis patients is caused by uremia toxin and by hemodialysis procedures [12]. Patients who undergoing hemodialysis experience various symptoms and all the symptoms have the potential to reduce the functioning of their daily activities and well-being. A study from Weisbord in 2005 on physical and emotional symptoms found that there were four reported symptoms of hemodialysis patients including dry skin (72%), feeling tired and not energized (69%), itching (54%), and bone / joint pain (50%).

Based on the result of the biverate analysis by *chi square* test showed there is correlation between the compliance of protein diet and clinical symptoms of the hemodialysis patients. This is same as the research done by Ayunda & Priyantini [13], the result gotten

Table 4: Description of Respondents Clinical Symptoms.

Category	Frequency (n)	Percentage (%)
Clinical Symptoms		
Non-symptoms	13	14,4
Symptoms	77	85,6
Types of clinical symptoms		
Itch	51	56,7
Dizzy	43	47,8
Appetite decreased	39	43,3
Nausea	33	36,7
Feeling weak or do not have energy	32	35,5
Insomnia	30	33,3
Anxiety	29	32,2
Shortness of breath	22	24,4
vomiting	22	24,4
Muscle cramps	15	16,7
Decreased interest in sex	15	16,7
Dry skin	14	15,5
Chest pain	14	15,5
Trobble falling asleep	14	15,5
Cough	13	14,4
Swelling legs	12	13,3
Difficulty becoming sexually aroused	9	10
Constipation	8	8,9
Headache	8	8,9
Feeling sad	7	7,8
Dry mouth	7	7,8
Numbness or tingling in feet	7	7,8
Bones or joint pain	7	7,8
Feeling anxious	4	4,4
Muscle soreness	4	4,4
Feeling irritable	4	4,4
Worrying	3	3,3
Restless legs or difficulty keeping legs still	3	3,3
Concentration difficulty	2	2,2
Diarrhea	1	1,1

Total	Mean ± SD	Min	Max
Number of symptoms felt (0 – 30)	5,24 ± 4,959	0	25
Dialysis symptom burden (0 – 150)	9,79 ± 12,594	0	80

Table 5: Correlation Between the Compliance of the Protein Diet and Clinical Symptoms.

Compliance of protein diet	Clinical Symptoms				Total		Correlation coefficient	*P-Value*
	Symptoms		Non-symptom					
	n	%	N	%	N	%		
Compliance	14	15,5	7	7,8	21	23,3		
Non-compliance	63	70,0	6	6,7	69	76,7	0,284	0,010
Total	77	85,5	13	14,5	90	100,0		

is there is correlation between the compliance of the protein diet and life quality by *p-value* 0,000 ($p<0.05$). The compliance of protein diet holds important role on handling nutrition of the CKD patients who are under hemodialysis treatment. According the research done by Fahmia *et al* (2012) highlights, there is correlation between protein intake and nutrition status of the CKD patients who are under hemodialysis treatment. Yet, commonly patients who have nutrition status less than needed having problem such as anorexia, change in taste, dialysis that is non-adequate, psychosocial moreover caused depression [14]. Protein diet that is less than needed could cause higher morbidity, hospitalized, and death of hemodialysis patient [15]. On the hemodialysis patients, compliance of protein diet has an important role in minimizing uremia symptoms and avoiding complications to happen. Certain factors related to hemodialysis procedure such as membrane bio-incompatibility, protein lose, amino acids, inflammation, also metabolic acidosis are condition that needs nutrition intake especially high protein [16]. Clinical description on CKD patients could be seen real if blood urea level is more than 200 mg/dl because the blood urea concentration is an indicator if there is metabolism residual of protein in the body (Sukandar, 2006). The common cause of uremia is CKD who lead to excretion disorder. Urine that contains urea will be diffused back to the blood flow. Uremia in the kidney could cause diseases or toxicity that affected the glomerular and renal micro vascularization or renal tubules [16]. Uremia caused the dysfunction of almost all part of the body like fluids and electrolyte, endocrine-metabolic, neuromuscular, cardiovascular and lungs, skin, gastrointestinal, hematology, also immunology, those manifestation included queasy, throw up, apathetic, weakness, dry skin, and tiredness [17]

5. Conclusion

Since there is a correlation between compliance of protein diet and clinical symptoms among patients with CKD who are undergoing hemodialysis. Hence, hospitals are expected to be truly understand and able to inform the CKD patients who are

undergoing hemodialysis about the compliance of protein diet so improvement of the clinical symptoms could be seen from the patients.

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