RELATIONSHIP OF BODY MASS INDEX AND BLOOD PRESSURE WITH QUALITY OF LIFE OF HEMODIALYSIS PATIENTS IN MEDAN RASYIDA KIDNEY HOSPITAL

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ABSTRACT

Background: Hemodialysis therapy performed in kidney failure patients can change the physical and psychological conditions of these patients. This is one of the factors that affect the quality of life in hemodialysis patients. Even though they has been doing hemodialysis therapy for the rest of their life, it is highly expected to have a good quality of life so that it can still be productive. The aim of this study was to determine the relationship between body mass index and blood pressure with the quality of life of hemodialysis patients in Medan Rasyida Kidney Hospital in 2019.

Materials and Methods : This study used a retrospective cohort method for the past 6 months (September 2018 to February 2019). The population was all outpatients who performed hemodialysis therapy in the hospital and sampling of 120 patients. The sample of this study was taken using purposive sampling technique. Quality of life data was obtained using the KDQOL^{TM}-36 questionnaire.

Results: The results of the Chi-Square Test showed that the body mass index variable (p value = 0.037, Relative Risk = 2, 95% CI 1.085-3.688) and blood pressure (p value = 0.004, Relative Risk = 3.106, 95% CI 1.387-6.955) associated with quality of life of hemodialysis patients.

Conclusion: Based on the results of the study it can be concluded that there is a significant relationship between body mass index and blood pressure with the quality of life of hemodialysis patients.

Keywords: Hemodialysis, quality, BMI, pressure, blood

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1.0 Introduction

The National Kidney Foundation (2019) estimates that there are as many as 37 million American adults or 15 percent of the adult population suffering from chronic kidney disease (CKD). The NKF also states that one in three American adults is at risk of developing chronic kidney disease. According to Prasad (2015), countries in Asia have a growing number of End Stage Renal Disease (ESRD) patients where annual growth in ESRD is more than 10 percent. This trend tends to occur due to progressive aging and an increasing number of people with diabetes and hypertension. The demographic population of kidney failure in Asian countries is at a relatively younger age, which is two decades younger than in developed countries and has a prevalence of 17-20 percent of chronic kidney disease with no known cause.

The results of the Riset Kesehatan Dasar (Basic Health Research/Riskesdas) in Indonesia in 2018 stated that there was an increase in chronic kidney disease by 0.18 percent from Riskesdas in 2013. Indonesian Renal Registry (IRR) data for 2017 stated that the highest proportion of patients was in the age group of 45 to 64 year (30.56%). The results of the data also showed that for patients aged less than 25 years contributed 2.64 percent.

Based on the description of these data, it is time to pay more attention to chronic kidney disease. Decreased kidney function slowly in patients with chronic kidney failure causing kidney failure so they have to do hemodialysis. Increased chronic kidney patients will cause an increase in hemodialysis. Hemodialysis is an action or process taken to remove waste that has accumulated from the blood. The goal of hemodialysis is to manage uremia, excess fluid and electrolyte imbalances that occur due to chronic kidney disease.

Hemodialysis in patients with kidney failure must be done to be able to maintain his life. In patients of productive age groups, in addition to being able to extend his life it is also expected to improve his quality of life. Quality of life is how an individual's perception of his condition in living his life according to the system and cultural values in his environment with the goals, expectations, standards and worries contained in him (WHOQOL, 2004). There are several factors that can affect the quality of life in hemodialysis patients such as blood pressure, hemoglobin levels, hemodialysis adequacy, nutritional status, mineral conditions and fluid balance (Cahyaningsih, 2009).

When the kidneys cannot function properly, it will cause metabolic waste products from what is eaten and drunk will accumulate in the body due to being unable to be removed by the kidneys. In addition, when hemodialysis patients do dialysis therapy, it will cause a lot of wasted nutrients because the dialysis machine does not recognize the important substances in the blood and this often makes the hemodialysis patient malnourished. Based on this, it is very important for hemodialysis patients to carry out dietary therapy and nutritional intervention on themselves. Kallenbach (2016) states that dietary requirements in hemodialysis patients are very individualistic, this depends on factors such as height, weight, nutritional status, level of kidney function, laboratory data, comorbid or recurrent illnesses, and prescribed drugs. such diets are individualized, but basically have certain diet similarities to a large extent in hemodialysis patients.

Abnormal blood pressure such as hypertension is a risk factor for chronic kidney failure. According to the IRR report in 2017, it states that the etiological proportion in chronic kidney disease patients is hypertension as much as 36% with the first rank. Aside from being a risk factor, abnormal blood pressure is also the incidence of complications during hemodialysis for patients. IRR data for 2017 obtained that the incidence of complications for hypotension was 21412 and for hypertension was 55533 and the figures obtained for hypertension were the highest rates for the incidence of complications in hemodialysis patients. This study received research permission from the hospital and showed that there was a relationship between BMI and blood pressure with quality of life in hemodialysis patients.

2.0 Materials and Methods

This research was conducted in Medan Rasyida Kidney Hospital in the period September 2018 to February 2019 with a retrospective cohort study design approach (historical cohort study). The study population was all outpatients undergoing hemodialysis therapy. Sampling is done by nonprobability sampling technique with the type of purposive sampling based on inclusion and exclusion criteria. Inclusion criteria were patients aged 18 years and over, patients who had undergone hemodialysis over six months and were willing to be respondents. Exclusion criteria are patients who have decreased consciousness or complications during the study so it is difficult to be interviewed, patients who have injuries, patients with disabilities and patients who do not have complete data. Based on the time period of the study and the inclusion and exclusion criteria, the study sample was obtained by 120 patients.

Primary data collection is done by interview and measurement of height. Quality of life data was obtained through filling the Kidney Disease Quality Of Life-36 (KDQOL-36) questionnaire and then the questionnaire answers were analyzed with the KDQOL^{TM}-36 Scoring Program (V 2.0) application (Rand, 2000). Secondary data obtained from medical record data consisting of data on body weight and blood pressure of patients.

3.0 Result

3.1 Characteristics of Respondents

In accordance with the inclusion criteria in this study, respondents were patients aged 18 years and over. Based on the results of data collection of 120 respondents, it was found that the most age groups were between 46-65 years, namely 67 patients (55.8%) then in the 26-45 years age group of 46 patients (38.3%). Age groupings based on the Republic of Indonesia Ministry of Health in 2009 divided the age categories of early adulthood between 26-35 years and late adulthood between 36-45 years (Ministry of Health, 2018).

The results showed that the most sexes were men by 72 people (60%) while women by 48 people (40%). Characteristics of the work obtained the most are patients who work for 72 people (60%). Based on interviews with hospital management it is known that in the

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beginning hospitals only accepted hemodialiasis patients from the general public and who have health insurance covered by companies or government or private institutions, causing many patients with employee status. In table 1, it can be seen the distribution of body mass index and blood pressure of patients in Medan Rasyida Kidney Hospital. The data obtained are the average value for 6 months of body weight, average blood pressure on systolic and diastolic before hemodialysis and after hemodialysis. The results showed that there were 64 patients (64%) who had a normal BMI while in blood pressure the highest rate was obtained in abnormal blood pressure by 71 patients (59.2%). Overall, the characteristics of respondents can be seen in table 1.

Table 1. Distribution of Respondent Characteristics in Medan Rasyida Kidney Hospital

Characteristics of Respondents	Amount (Persons)	Percent
Age		
> 65 years	2	1.7
46 - 65 years	67	55.8
26 - 45 years	46	38.3
18 – 25 years	5	4.2
Gender		
Men	72	60.0
Women	48	40.0
Occupation		
Not Employee	48	40.0
Employee	72	60.0
BMI		
Skinny	6	5.0
Obesity	50	41.7
Normal	64	53.3
Blood pressure		
Abnormal	71	59.2
Normal	49	40.8

Measurement of quality of life in hemodialysis patients at Rasyida Kidney Hospital was carried out using the Kidney Disease Quality Of Life 36 (KDQOL-36) instrument, a questionnaire consisting of 36 questions. Measurement of quality of life is divided into 5 types of measurements which are divided into measurements of physical components and mental components (12 Short-Form items), kidney disease burden (4 question items), symptoms/problems (12 question items), effects of kidney disease (8 question items). The results showed that of 120 patients there were 87 patients (72.5%) who had good quality of life and there were 33 patients (27.5%) who had poor quality of life.

Table 2. Distribution of Quality of Life in Hemodialysis Patients in Medan Rasyida Kidney Hospital

Quality of Life	Amount (person)	Percent
Good	87	72.5
Poor	33	27.5
Total	120	100

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Value of quality of life for each type of measurement has a score of 0-100. In table 3, it is a breakdown of the type of measurement of quality of life in hemodialysis patients in Medan Rasyida Kidney Hospital consisting of Mean, Median and Standard Deviation values. Measurement of the physical component obtained a Mean value of 41.14 which means that the average hemodialias patient has a physical condition that is not so strong and the mental component obtained a Mean value of 49.04 which means that the average hemodialysis patient also has a mental condition that is a little weak. In the measurement of the burden of kidney disease, the mean value is 40.42, which means that the average patient feels a burden in his family both physically, mentally and also financially. Measurement of symptoms/problems obtained a mean value of 77.00 which means that the average patient has symptoms/problems that are somewhat bothered in daily life. Measurement of the impact of kidney disease obtained a mean value of 80.73, which means that the average patient at the Rasyida Kidney Hospital in Medan felt not at all bothered about the impact of his kidney failure in his daily life.

Table 3. Distribution of Mean, Median and Standard Deviation Values on Measurement Types of Quality of Life in Hemodialysis Patients in Medan Rasyida Kidney Hospital

Types of measurements	Mean	Median	Standard Deviation	n
Physical components (6)	42.14	41.27	8.60	120
The mental component (6)	49.04	49.72	8.59	120
The burden of kidney disease (4)	40.42	37.50	27.74	120
Symptoms/problems (12)	77.00	77.08	15.36	120
Impact of kidney disease (8)	80.73	84.38	14.90	120

3.2 Description of Hemodialysis in Medan Rasyida Kidney Hospital

Every once a month, the management of Rasyida Kidney Hospital conducts routine laboratory examinations of blood, such as hemoglobin levels and the result of hemodialysis adequacy. The average result of hemodialysis adequacy for six months showed that all patients had good adequacy with Urea Reduction Ratio (URR) values above 65%. The duration of hemodialysis that has been undertaken by patients shows that for over three years there were 59 patients (49.2%), between 1-3 years there were 48 patients (40%) and those under one year there were 13 patients (10.8%). Rasyida Kidney Hospital has a number of hemodialysis frequencies consisting of 2 categories: twice a week and three times a week. Based on the results of interviews with the hospital stated that the frequency of hemodialysis assigned to the patient is based on the patient's needs.

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Table 4. Description of Hemodialysis in Hemodialysis Patients in Rasyida Kidney Hospital Medan

Variable	Amount(Person)	Percent
HD adequacy		
Not adequate	0	0.0
Adequate (URR ≥ 65%)	120	100.0
Duration of HD		
> 3 years	59	49.2
1-3 years	48	40.0
< 1 years	13	10.8
Frequency of HD		
2 times a week	98	81.7
3 times a week	22	18.3

3.3 Relationship Between Body Mass Index (BMI) and Quality of Life of Hemodialysis Patients in Medan Rasyida Kidney Hospital.

The results of the analysis using the Chi-Square Test obtained p value of 0.037 and the relative risk (RR) for poor quality of life of 2 (95% CI 1.085-3.688), which means that there is a significant relationship between BMI and quality of life in hemodialysis patients.

Table 5. Relationship between BMI with Quality of Life for Hemodialysis Patients in Medan Rasyida Kidney Hospital.

Variable	Quality of Life				Total		Relative Risk (95% CI)	P value
	Poor		Good					
	n	%	n	%	n	%		
BMI								
Abnormal	21	37.5	35	62.5	56	100.0	2.00	0.037
Normal	12	18.8	52	81.3	64	100.0	(1.085-3.688)	

3.4 Relationship Between Blood Pressure and Quality of Life of Hemodialysis Patients in Rasyida Kidney Hospital Medan.

Table 6 shows that the p value is 0.004 and the RR value is 3.106 (95% CI 1.387-6.955). Based on these results it is known that there is a relationship between blood pressure and quality of life in hemodialysis patients.

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Table 6. Relationship Between Blood Pressure and Quality of Life of Hemodialysis Patients in Medan Rasyida Kidney Hospital.

Variable	Quality of Life				Total		Risk Relative (95% CI)	P Value
	Poor		Good					
	n	%	n	%	n	%		
Blood Pressure								
Abnormal	27	38.0	44	62.0	71	100.0	3,106	0.004
Normal	6	12.2	43	87.8	49	100.0	(1.387-6.955)	

4.0 Discussion

Adulthood is a time for a person to be very productive both in his work career and also in his life. As a person ages, his quality of life will also decrease both physically and also to his health (Martin, 2015). Hemodialis patients in the adult group are expected to have a good quality of life so that they can support their productivity. The results showed that the most sexes were men by 72 people (60%) while women by 48 people (40%). This shows that male gender tends to be affected by chronic kidney failure, which can be caused by unhealthy behaviors such as smoking, lack of exercise and drinking alcoholic beverages (Martin, 2015). In accordance with research conducted by Rustandi et al (2018), which states that there is a relationship between sex and quality of life for hemodialysis patients (p <0.001).

The BMI variable in the results of the study showed a p value of 0.037 with a relative risk value of 2 (95% CI 1,085-3,688), this was also the same as the results of a study conducted by Putri (2014) at Rasyida Kidney Hospital with a p value of 0.03. However, it is different from the results of research conducted by Astrini (2013) which shows that there is no relationship between BMI and the quality of life of hemodialysis patients (p = 0.067). The relative risk value in this study was obtained at 2 which means that patients who have an abnormal BMI will have a 2 times greater chance of poor quality compared to patients who have a normal BMI. Abnormal BMI in hemodialysis patients often occurs because when a kidney failure patient has to do hemodialysis, it will cause a decrease in appetite, or an improper diet often occurs because they do not know what kind of food to eat, causing an unbalanced weight loss (Kallenbach, 2016).

The blood pressure variable in the results of the study showed a p value of 0.004 with a relative risk value of 3 (95% CI 1,387-6,955) which means that in patients who have abnormal blood pressure will have a 3 times greater chance of a poor quality of life compared to patients who have normal blood pressure. The results of this study are not in line with the results obtained by Astrini (2013) at the Dokter Soedarso Hospital in Pontianak in April 2013, which showed that there was no significant relationship between blood pressure and quality of life in hemodialysis patients.The results of this study indicate that patients who have abnormal blood pressure can affect their quality of life. Clinically abnormal blood pressure such as hypertension can cause kidney damage and kidney damage causing hypertension which can cause cardiovascular complications and is the most common cause of death in hemodialysis patients (Kallenbach, 2016). Abnormal blood pressure can cause the patient's condition to become unstable, this will also cause the patient's activity to be disrupted so that it can affect

the patient's quality of life. Based on this, it is desirable that hemodialysis patients can maintain their blood pressure.

5.0 Conclusion and recommendation

5.1 Conclusion

The results of a retrospective cohort study of 120 hemodialysis patients in Medan Rasyida Kidney Hospital using the Chi-Square test showed that the BMI variable obtained a p value of 0.037 with a relative risk value of 2 (95% CI 1.085-3.688) and the blood pressure variable obtained p value of 0.004 with a relative risk value of 3.106 (95% CI 1.387-6.955). Both variables have a p value <0.05 which means that there is a significant relationship between body mass index and blood pressure on quality of life of hemodialysis patients in Medan Rasyida Kidney Hospital. In addition, the relative risk value obtained by the two variables shows that it is greater than one, which means that the BMI and blood pressure variables are risk factors for poor quality of life of hemodialysis patients in Medan Rasyida Kidney Hospital.

The results of this study are also the same as the results of research conducted by Putri (2014) at Rasyida Kidney Hospital with a p value of 0.03. However, it was different from the results of research conducted by Astrini (2013) which shows that there was no relationship between BMI and the quality of life of hemodialysis patients (p = 0.067). The relative risk value in this study was obtained at 2 which means that patients who have an abnormal BMI will have a 2 times greater chance of poor quality compared to patients who have a normal BMI.

5.2 Recomandation

A good quality of life for hemodialysis patients in Medan Rasyida Kidney Hospital is expected so that each patient can still be productive. Related to blood pressure, in general the higher the weight then the higher the blood pressure. Based on this, it is highly expected that hemodialysis patients can maintain their weight. A good quality of life can be obtained by maintaining nutrients in the body and also by maintaining blood pressure to be stable.

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Declaration

Author(s) declare that there are no conflicts of interest

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