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Research

Path Analysis on Factors Affecting the Use of Hemodialysis in Patients Chronic Renal Disease at Dr. Soehadi Prijonegoro Hospital Sragen, Central Java

Anisa Andriani[1)], Didik Gunawan Tamtomo[2)], Bhisma Murti[3)]

[1)]Masters Program in Public Health, Universitas Sebelas Maret
[2)]Faculty of Medicine, Universitas Sebelas Maret

ABSTRACT

Background: Patient adherence can be influenced by several factors that can affect compliance with hemodialysis treatment. Adherence is highly treated while undergoing hemodialysis in order to achieve success in hemodialysis (HD) treatment. Adherence is one of the behaviors of a person in achieving successful HD treatment. The success of a treatment can be influenced by several factors, one of which is the use of HD. This study aimed to determine the effect of compliance with hemodialysis.
Subjects and Method: The was an observational analytic study with a cross-sectional design. The study was conducted in January 2020. The sample used was 120 chronic kidney failure patients undergoing hemodialysis at Dr. Soehadi Prijonegoro Sragen Hospital. The dependent variable was compliance with hemodialysis. The independent variables are: knowledge, length of care, family income. Data were collected by means of a questionnaire. Data analysis was performed using path analysis with Stata 13.
Results: The use of HD in patients with chronic renal failure had a positive association with high HD knowledge (b= 1.22; 95% CI= 2.21 to -3.98; p= 0.027), length of stay (b= 2.09; 95% CI= 4.29 to 3.05; p<0.001), and has no positive relationship with family income (b = 0.40; 95% CI = 0.80 to 1.41; p = 0.426). The use of HD in patients with chronic renal failure is influenced indirectly by family income and length of treatment.
Conclusion: The use of HD in chronic renal failure patients has a direct relationship with knowledge of HD and length of treatment, and has no direct relationship with family income. The use of HD in patients with chronic renal failure is influenced indirectly by family income and length of treatment.

Keywords: hemodialysis, chronic renal failure

Correspondence:
Anisa Andriani. Masters Program in Public Health, Universitas Sebelas Maret. Jl. Ir. Sutami 36A, Surakarta 57126, Central Java. Email: andrianianisa390@gmail,com. Mobile: +6282220826660.

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BACKGROUND

Chronic Renal Failure Disease is a non-communicable disease and the course of the disease is usually long or chronic, increased blood urea levels or uremic syndrome, with complaints that the patient requires action, one of which is hemodialysis. Adherence is one of the behaviors of a person in achieving successful HD treatment. The use of hemodilysis has a concerning impact because it will affect the occurrence of acute and chronic complications, the length of treatment and have an impact on productivity and reduce human resources.

According to the Indonesian Renal Registry Research in 2017, the prevalence

of HD units was 655 renal units. The proportion of HD Units in Central Java province reaches 46.9%. Hemodialysis measures have increased from year to year and in 2017 increased in line with the BPJS Kesehatan or JKN program so that they have full access and financing for chronic hemodial therapy. The number of HD actions in 2017 was 1,694,432 HD actions. The number of renal units in Indonesia has grown very rapidly since the launch of the JKN program because all people have access to become JKN members and hemodialysis services. HD patient financing in 2017 was as much as 89% of patient financing came from JKN PBI and Non PBI, JKN Non PBI financing totaled 20,252 patients (71%), while JKN PBI was 4,990 patients (17%), and the rest was divided by patients who paid alone as much as 9% of the total patients.

SUBJECTS AND METHOD

1. Study Design

The was an analytic observational study with a cross-sectional design. The study was conducted at the Regional General Hospital Dr. Soehadi Prijonegoro Sragen, in January 2020.

2. Population and Sample

The population was all chronic kidney failure patients undergoing HD care at Dr Soehadi Prijonegoro Sragen Hospital. Samples taken were as many as 120 study subjects. Sampling in this study was conducted using random sampling.

3. Variables

Dependent variable is compliance with hemodialysis. The independent variables in this study are knowledge, length of care, family income.

4. Operational Definition of Variables

Knowledge is the result of human sensing, or the result of a person's knowing of an object through the senses he has so that it produces knowledge. Knowledge in the operational definition of this variable is the patient's level of knowledge about hemodialysis. The measuring instrument used is a questionnaire. The data scale is Continuous, code 0 for low knowledge and 1 for high knowledge.

Duration of treatment is the length of time for chronic renal failure patients undergoing hemodialysis treatment in the hospital dialysis unit, grouped into groups of less than 2 years undergoing hemodialysis and more than 2 years undergoing hemodialysis. The measuring instrument used is a questionnaire. The data scale is continuous and for analysis purposes the data is converted into a dichotomy with a code of 0 <3 years and 1 ≥ 3 years.

Family income is per capita income per month which is calculated by the average income received by a family expressed in rupiah. The measuring instrument used is a questionnaire. The data scale is continuous and for analysis purposes the data is transformed into a dichotomy with code 0 ≤ IDR 1,815,914 and 1 ≥ IDR 1,815,914

5. Data Analysis

Univariate analysis is used by researchers to perform data analysis and statistical tests on research data which include: univariate analysis, which describes each dependent and independent variable and grouped according to the type of data and entered. Bivariate analysis was performed using the chi square, which is knowing the relationship of each independent variable to the dependent variable.

Multivariate analysis was performed using multiple linear regression analysis using Stata 13. Linear regression is a useful model for analyzing the systematic relationship that occurs between the dependent variable Y and one or more independent variables X (Murti, 2013).

6. Research Ethics

This research was conducted based on research ethics, namely informed consent, confidentiality anonymity, and ethical feasibility. Ethical permission in this study was obtained from the Health Research Ethics Commission of Dr. Soehadi Prijonegoro Sragen Hospital, Indonesia, No. 004 / Etik-Crssp / XII / 2019.

RESULTS

1. Univariate Analysis

Table 1 shows the knowledge variable has a mean= 5.33 and SD= 1.84. The lowest knowledge score is 2 and the highest is 9. The length of treatment variable shows the mean= 3.56 and SD= 1.81. The lowest score of treatment duration is 1 and the highest is 9. The family income variable shows the mean= 1,948,333,33 and SD= 807,317.72. The lowest score of family income is 1,000,000 and the highest is 4,500,000.

2. Univariate Analysis of Categorical Data

Table 2 shows that of the 120 research subjects. It was obtained that 36 patients had low knowledge (30.0%) and high knowledge as many as 84 patients (70.0%).

Family income <Rp. 1,815,914, a total of 58 patients (48.3%) and an income ≥ Rp 1,815,914, there are 62 patients (51.6%). Length of stay <3 years there are 43 patients (35.8%) and ≥3 years there are 77 (64.1%).

Table 1.Univariate analysis (continuous data)

Variable	n	Mean	SD	Min.	Max.
Knowledge	120	5.33	1.84	2	9
Duration of treatment	120	3.56	1.81	1	9
Family Income	120	1,948,333.33	807,317.72	1,000,000	4,500,000

Table 2.Univariate analysis (dichotomous data)

Variable	Frequency (n)	Percentage (%)
Knowledge		
High	36	30.0
Low	84	70.0
Duration of treatment		
<3 years	43	35.8
≥ 3 years	77	64.1
Family income		
< Rp 1,815,914	58	48.3
≥ Rp 1,815,914	62	51.6

3. Bivariate Analysis

The bivariate analysis in this study aims to explain the relationship between the independent variables (knowledge, length of stay, family income and the dependent variable (use of hemodialysis).

Table 3. The results of the chi-square test of factors using hemodialysis on knowledge, length of care, family income

Variable	HD use						OR	95% CI	p
	1 time/week		2 times/week		Total				
	N	%	n	%	N	%			
Knowledge									
Lacking	20	55.56	16	44.44	36	100	3.12	1.28-7.60	0.005
Good	24	28.57	60	71.43	84	100			
Duration of treatment									
< 3 years	26	60.47	17	39.53	43	100	5.01	2.07-12.19	0.001
≥ 3 years	18	23.38	59	76.62	77	100			
Family Income									
< Rp.1,815,914	32	55.17	26	44.83	58	100	5.12	2.12-12.69	<0.001
≥ Rp.1,815,914	12	19.35	50	80.65	62	100			

Hemodialysis patients with the influence of knowledge on the use of hemodialysis showed that high knowledge had a higher effect on the use of hemodialysis (OR= 3.12; p= 0.005).

Hemodialysis patients with the influence of length of treatment on the use of hemodialysis, showed that the length of treatment ≥ 3 had more effect on the use of hemodialysis was higher (OR= 5.01; p= 0.001). Hemodialysis patients with a higher influence on family income ≥ Rp 1,815,914 used hemodialysis (OR= 5.12; p <0.001).

4. Multivariate Path Analysis

Multivariate analysis with the path analysis model was carried out using Stata 13. The variables in the model consisted of 3 endogenous variables and 1 exogenous variable. Degree of freedom (df) is 2, which means that df is over identified so that path analysis can be carried out.

Table 4. Path analysis Results of path analysis of factors that have a direct or indirect effect on the use of hemodialysis.

Endogenous Variables		Exogenous Variables	Path Coefficient (b)	95% CI		p
				Lower Limit	Upper Limit	
Direct Effect						
Use of HD	←	Knowledge (High)	1.57	2.88	2.64	0.004
	←	Duration of treatment (≥3 years)	2.09	4.29	3.05	0.001
	←	Income (≥ Rp. 1,815,914)	0.40	0.80	1.41	0.426
Indirect Effect						
Knowledge	←	Income (≥ Rp 1,815,914)	1.818	3.59	2.803	<0.001
	←	Duration of treatment (≥3 years)	1.83	3.50	1.41	<0.001
n observation = 120						
Log Likelihood = -109.83						

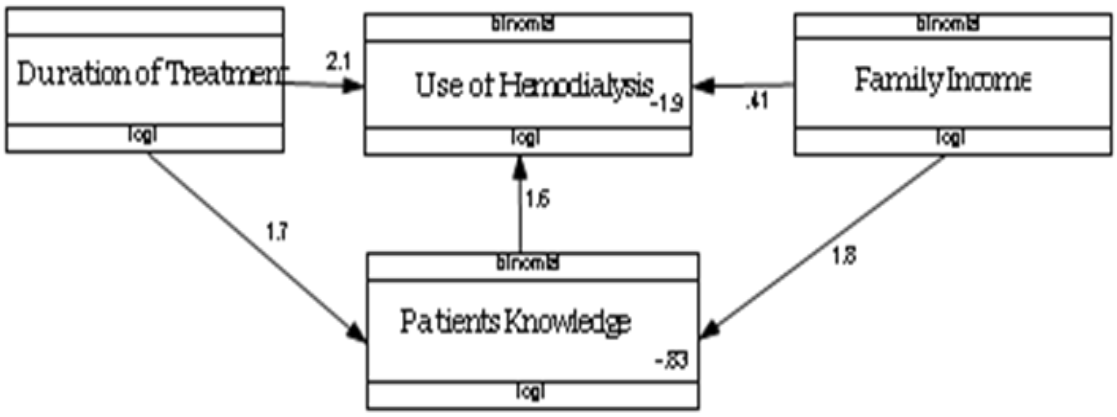

Figure 1. Path analysis model on the determinants of haemodialysis uptake

Path analysis shows that the use of hemodialysis directly increases with knowledge and length of treatment of the use of hemodialysis. The use of hemodialysis is indirectly affected by income.

Table 4 shows that knowledgeable use of hemodialysis was more likely (logodd) to use hemodialysis by 1.57 units (b= 1.57; 95% CI= 2.88 to 2.64; p= 0.004).

Chronic renal failure patients with a length of stay ≥3 years had a probability (logodd) to use hemodialysis 2.09 units greater than the length of treatment <3 years (b= 2.09; 95% CI= 4.29 to 3.05; p= <0.001).

Chronic renal failure patients with family income ≥Rp 1,815,914 have the possibility (logodd) to use hemodialysis 1.83 units greater than family income <Rp 1,815,914 (b = 1.83; 95% CI = 3.50 to 1.41; p = 0.426).

DISCUSSION

1. The effect of knowledge on the use of hemodialysis in patients with chronic renal failure

The results of the analysis show that knowledge has an influence on the use of hemodialysis in patients with chronic renal failure. The results of this study indicate how much the direct relationship is with the path coefficient value of 1.57 and p= 0.004 and it is statistically significant. High knowledge increases the use of hemodialysis by 1.57 units compared with less knowledge.

This study is in line with Fadlalmola et al., (2020) which showed that there was a significant increase in the overall mean of knowledge from 48.6% before intervention to 86.3% after intervention. This is in line with Elata et al., (2015) which shows that the majority of respondents have a high level of knowledge about kidney dialysis. Someone's knowledge will be able to increase obedience in doing something. This is clear because someone knows the benefits of doing something and the impact that will arise if they do not do this, for example, the patient does not hemodilysis, the patient will feel various complaints that have discomfort and even helplessness and vice versa if the patient complies, the patient will feel healthy to be able to carry out the daily activities so they can feel their welfare fulfilled.

Knowledge arises when a person uses their intellect to recognize certain objects or events that have never been seen or felt before. Knowledge will lead someone to do

something, for that patients with kidney failure undergoing hemodialysis already know what things need to be done regarding hemodialysis therapy such as access to support sources, nutritional needs, dietary food, and being able to overcome complications of the disease have quality higher life (Barzegar et al., 2017; Spies et al., 2020; Ersan et al., 2017).

Knowledge means everything that is known about something, as well as knowledge about hemodialysis. Knowledge provides a correct understanding of what hemodialysis is, its purpose for it, indications, contraindications, diet, allowable fluid intake, complications that will arise if non-compliance and indicators of success in carrying out regular hemodialysis. With this knowledge, patients with kidney failure will comply with hemodialysis, knowledge or cognitive domains are very important domains in shaping one's actions (over behavior) (Notoatmojo, 2012; Alikari et al., 2018).

2. The effect of length of treatment on the use of hemodialysis

The analysis showed that the length of treatment had an influence on the use of hemodialysis in chronic renal failure patients. The results of this study indicate how much the direct relationship is with the path coefficient value of 2.09 and the value of p< 0.001 which is statistically significant. Length of stay ≥ 3 years increased the use of hemodialysis by 2.09 units compared to length of stay <3 years.

This study is in line with Pratiwi et al., (2017) which shows a positive and significant effect of hemodialysis frequency on the use of hemodialysis. The frequency of hemodialysis often had a quality of life logodd of 1.21, the rarest frequency. Patients who undergo longer hemodialysis treatments can get more nutrition through a higher frequency of hemodialysis will have a better quality of life, especially due to the effect of malnutrition on morbidity and mortality (Shafiee et al., 2017).

The duration of hemodialysis was significantly associated with hemodialysis. Each patient needs different times in adapting to the changes he experiences such as symptoms, complications and lifelong therapy. So that the quality of life in patients with chronic renal failure also fluctuates according to the time required for each stage of adaptation to hemodialysis therapy. Respondents who undergo longer hemodialysis have an adequate quality of life because the longer the patient undergoes hemodialysis, the patient will get used to and accept all the symptoms and complications. Patients who can accept their conditions well will have a good quality of life too, because the quality of life is focused on respondent acceptance of the condition they feel (Mailani et al., 2019; Indrarini et al., 2019).

3. The effect of family income on the use of hemodialysis,

The analysis showed that income had no effect on the use of hemodialysis in chronic renal failure patients. The results of this study indicate how much the direct relationship is with the path coefficient value of 0.40 and the p= 0.426 and it is statistically significant. Income ≥Rp 1,815,914 has no effect on the use of hemodialysis by 0.04 units.

This study is not in line with the research of Lemos et al., 2015 which states that family income is very influential with hemodialysis. Someone who has an income or an economy that is sufficient, that person can meet all his needs such as all the needs to improve the quality of health. However, hemodialysis in Indonesia is covered by BPJS Health, so that participants can be helped, including people with low income or less fortunate. Low-income or under-

privileged people can also improve the quality of their health by utilizing the BPJS they have (BPJS Kesehatan, 2020).

AUTHOR CONTRIBUTION

Anisa Andriani as the main researcher is as a research implementer, collects related articles, conducts research, analyzes data, and writes research papers. Didik Gunawan Tamtomo played a role in developing ideas, research designs and research hypotheses. Bhisma Murti played a role in compiling the research framework, processing research data, representing the results of research analysis, and preparing research papers.

CONFLICT OF INTEREST

There is no conflict of interest.

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