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FACTORS ASSOCIATED WITH THE INCIDENCE OF CHRONIC RENAL FAILURE IN THE HEMODIALYSIS ROOM

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ABSTRACT

Chronic kidney disease takes place continuously from time to time. The incidence of chronic kidney disease is heavily influenced by various incident factors such as predisposing factors, biomedical factors, behavioral factors. The purpose of this study was to determine the factors associated with the incidence of chronic kidney failure in the hemodialysis room at Dumai City General Hospital. The design of this study is a correlation description with a cross sectional approach. The research was conducted in March–August 2020. The population in this study were 137 hemodialysis patients with a sample of 102 respondents. Sampling technique with purposive sampling. Data were analyzed univariately and bivariately with a computerized system. The results of the study found that there was a relationship between age, gender, education, family history, history of UTI, history of BSK, history of DM, history of hypertension, history of consuming drugs, history of smoking, history of consuming supplementary drinks and history of drinking water with the incidence of chronic kidney failure in the hemodialysis room at Dumai City General Hospital (pvalue = 0.000). There is no relationship between a history of consuming alcohol and the incidence of chronic kidney failure in the hemodialysis room at the Dumai City General Hospital (pvalue = 0.828). It is expected that health workers will improve health promotion regarding the risk factors that cause chronic kidney failure. There is no relationship between a history of consuming alcohol and the incidence of chronic kidney failure in the hemodialysis room at the Dumai City General Hospital (pvalue = 0.828). It is expected that health workers will improve health promotion regarding the risk factors that cause chronic kidney failure. There is no relationship between a history of consuming alcohol and the incidence of chronic kidney failure in the hemodialysis room at the Dumai City General Hospital (pvalue = 0.828). It is expected that health workers will improve health promotion regarding the risk factors that cause chronic kidney failure.

Keywords: Factors, Chronic Renal Failure, Hemodialysis.

INTRODUCTION

Chronic kidney failure is a pathophysiological process with various etiologies resulting in a progressive decline in kidney function and generally ends in kidney failure. Chronic kidney disease takes place continuously from time to time, where the value of the Glomerular Filtration Rate (GFR) is less than 60 mL/min/1.73 for three months or more (Yusuf, 2012). When the patient has experienced kidney damage and needs enough to get permanent kidney replacement therapy, the patient has entered stage five or the final stage of Chronic Kidney Disease (CKD) or End Stage Renal Disease (ESRD).(Smeltzer, et al, 2010).

According to the United States Renal Data System (USRDS) the number of incidents of ESRD cases in America at the end of 2013 was 117,162, this number of events was adjusted for a population of 363 million/year. The incidence rate of ESRD is approximately 3 times higher in black/African Americans than in other races. (USRDS, 2015).

According to Basic Health Research (RISKESDAS) in 2018, the prevalence of chronic kidney failure based on a doctor's diagnosis in Indonesia increased from 2% per mil in 2013 to 3.8% per mil in 2018. The highest prevalence of kidney failure was in North Kalimantan at 6.4% per mil, followed by Maluku, Gorontalo and North Sulawesi with 4% per mil. The Eleventh Report of the Indonesian Renal Registry (2019) reports that of all patients diagnosed with kidney disease, 2% are ESRD patients. In 2019, there were 1,273 patients diagnosed with ESRD in Indonesia. In Riau, it was reported that there was an increase in the number of patients diagnosed with ESRD by 1.7% in 2018 (Indonesian Nephrology Association (PENEFRI), 2019).

The incidence of chronic kidney disease is influenced by many factors. There needs to be a role for risk factors together (common underlying risk factor) for the occurrence of chronic kidney disease, in other words, one factor alone is not enough to cause chronic kidney disease (Restianika, 2014). According to the Australian Institute of Health and Welfare (2019), which has systematized risk factors for chronic kidney disease undergoing hemodialysis. Risk factors for chronic kidney disease are divided into four groups, namely: 1) social-environmental factors which include socioeconomic status, physical environment and availability of health care institutions, 2) biomedical risk factors which include diabetes, hypertension, obesity, metabolic syndrome, urinary tract infections, kidney stones and urinary tract stones, glomerulonephritis, streptococcal infections and drug poisoning; 3) behavioral risk factors which include smoking or tobacco use, lack of movement and exercise and lack of food, and 4) predisposing factors which include age, gender, race or ethnicity, family history and genetics.

The results of research conducted by Sutopo (2016) showed that there was a relationship between gender ($p=0.005$; $OR=4.364$), level of education ($p=0.028$; $OR=7.385$), history of UTI ($p=0.005$; $OR=9.286$), history of BSK ($p=0.049$; $OR=9.156$), history of DM ($p=0.003$; $OR=10.333$), history of hypertension ($p=0.000$; $OR=14.50$), history of drug use ($p=0.003$; $OR = 7.727$) and history of consumption of supplements ($p = 0.020$; $OR = 7.286$) with the incidence of chronic kidney disease.

The Dumai City General Hospital in Riau Province is a reference for several other health services apart from Dumai City itself, including Rohil Regency and Bengkalis Regency. The number of procedures performed at the Hemodialysis Installation has increased over the last 5 years. In 2015 there were 1,425 patients with 10,664 procedures, in 2016 there were 1,557 patients with 11,077 procedures, in 2017 there were 1,644 patients with 11,364 procedures and in 2019 there were 7,211 hemodialysis procedures. The average patient who performs hemodialysis at the Dumai City Hospital Hemodialysis Unit is around 20 people/day (Dumai City Hospital Medical Records, 2019).

Based on the initial survey obtained on February 23, 2020, it was found that the average population of chronic kidney failure patients undergoing hemodialysis was 137 people in one year. The results of the author's interview on 10 chronic kidney failure patients undergoing hemodialysis, namely 3 patients undergoing hemodialysis due to hypertension. 2 patients due to drinking water intake, 1 patient due to Diabetes Mellitus, 2 patients due to frequent consumption of energy drinks and 2 patients due to other factors. Chronic kidney failure should

be a serious concern considering the increasing prevalence of chronic kidney failure in Riau, the many complications experienced and the losses experienced by patients with chronic kidney failure.

RESEARCH METHODS

ResearchaThis study uses a correlation description design with a cross sectional approach. The research location was carried out in the hemodialysis room at Dumai City Hospital. The sampling technique in this study used purposive sampling with a sample of 102 respondents.

Data in this study were collected using a questionnaire adopted from research conducted by Sutopo (2016) consisting of three parts. The first part contains a predisposing factor questionnaire (age, sex, education level, and family history), the second part contains a biomedical factor questionnaire (history of urinary tract infection, history of urinary tract stone disease, history of diabetes mellitus, history of hypertension and history of use drugs), and the third part contains a behavioral factor questionnaire (history of smoking, alcohol consumption, consumption of supplementary drinks and intake of drinking water). This study uses univariate and bivariate data analysis. Bivariate analysis in this study used the Chi Square test..

RESULTS AND DISCUSSION

Table 1 Frequency Distribution of Respondents' Predisposing Factors in the Hemodialysis Room of Dumai City Hospital in 2020

No	Predisposing Factors	F	%
1	Age ≤ 60 years	40	39,2
	> 60 years	62	60,8
2	Gender Man	74	72,5
	Woman	28	27,5
3	Education Low	57	55,9
	Intermediate	33	32,3
	Tall	12	11,8
4	Family History Experience	81	79,4
	Not Experiencing	21	20,6
Amount		102	100

Table 1 shows that out of 102 respondents, the majority of 60.8% of respondents were aged > 60 years, the majority of 72.5% of respondents were male, the majority of 55.9% of respondents had a low level of education and the majority of 79.4% of respondents had a history of families with CRF.

Table 2 Frequency Distribution of Respondents' Biomedical Factors in the Hemodialysis Room

No	Biomedical Factors	f	%
1	UTI history		
	There is	80	78.4
	There isn't any	22	21,6
2	BSK history		
	There is	81	79.4
	There isn't any	21	20,6
3	DM history		
	There is	79	77.5
	There isn't any	23	22.5
4	History of hypertension		
	There is	76	74.5
	There isn't any	26	25.5
5	Drug history		
	There is	77	75.5
	There isn't any	25	24.5
	Amount	102	100

Based on table 4.2 shows that of the 102 respondents, the majority of 78.4% of respondents had a history of UTI, the majority of 79.4% of respondents had a history of BSK, the majority of 77.5% of respondents had a history of DM, the majority of 74.5% of respondents had a history of hypertension and the majority of 75.5% of respondents had a history of drugs.

Table 3 Frequency Distribution of Respondents' Behavioral Factors in the Hemodialysis Room

No	Alcohol consumption	f	%
1	Smoking history		
	There is	73	71.6
	There isn't any	29	28,4
2	History of alcohol consumption		
	There is	26	25.5
	There isn't any	76	74.5
3	Supplementary Drinks		
	There is	75	73.5
	There isn't any	27	26.5
4	Consumption of drinking water / white		
	Lots	54	52,9
	A little	48	47,1
	Amount	102	100

Based on table 4.3 shows that out of 102 respondents, the majority of 71.6% of respondents had a history of smoking, the majority of 74.5% of respondents did not have a history of consuming alcohol, the majority of 73.5% of respondents had a history of consuming supplementary drinks and the majority of 52.9% of respondents had a history of drink lots of water.

Table 3 Relationship between Age Factor and Chronic Kidney Failure in Hemodialysis Room

No	Age	Chronic Renal Failure		Total	%	α	<i>p.s-value</i>
		f	%				
1	≤60 Years	40	39,2	40	39,2	0.05	0.029
2	>60 years	62	60,8	62	60,8		
Total		102	100	102	100		

Based on table 3, it was found that out of 102 respondents, 62 (60.8%) respondents were aged > 60 years and had chronic kidney failure, and as many as 40 (39.2%) respondents were aged ≤ 60 years and had chronic kidney failure.

The results of the chi square statistical test showed that the value of $p = 0.029 < 0.05$, then H_0 was rejected, which means that there is a relationship between the age factor and the incidence of chronic kidney failure in the hemodialysis room at the Dumai City General Hospital.

Table 4 Relationship between Gender and Chronic Renal Failure in the Hemodialysis Room

No	Gender	Chronic Renal Failure		Total	%	<i>A</i>	<i>p.s-value</i>
		f	%				
1	Man	74	72.5	74	72.5	0.05	0.000
2	Woman	28	27.5	28	27.5		
Total		102	100	102	100		

Based on table 4 , it was found that out of 102 respondents, 74 (72.5%) were male and had chronic kidney failure, and 28 (27.5%) were female and had chronic kidney failure. The results of the chi square statistical test showed that the value of $p = 0.000 < 0.05$, then H_0 was rejected, which means that there is a relationship between the sex factor and the incidence of chronic kidney failure in the hemodialysis room at the Dumai City General Hospital.

Table 5 Relationship between educational factors and the incidence of chronic kidney failure in the hemodialysis room

No	Education	Chronic Renal Failure		Total	%	α	<i>p.value</i>
		f	%				
1	Low	57	55,9	57	55,9	0.05	0.000
2	Intermediate	33	32,3	33	32,3		
3	Tall	12	11,8	12	11,8		
Total		102	100	102	100		

Based on table 5 it was found that out of 102 respondents, 57 (55.9%) respondents had low education and had chronic kidney failure, 33 (32.3%) respondents had secondary education and had chronic kidney failure, and, 12 (11.8) % educated respondents and has chronic renal

failure. The results of the chi square statistical test obtained the results of $p = 0.000 < 0.05$, then H_0 was rejected, which means that there is a relationship between educational factors and the incidence of chronic kidney failure in the hemodialysis room at the Dumai City General Hospital.

Table 6 Relationship between family history and chronic kidney failure in the hemodialysis room

No	Family History	Chronic Renal Failure		Total	%	α	$p.s$ -value
		F	%				
1	Experience	81	79.4	81	79.4	0.05	0.000
2	Not Experiencing	21	20,6	21	20,6		
Total		102	100	102	100		

Based on table 6 , it was found that out of 102 respondents, 81 (79.4%) respondents had a family history of kidney failure and chronic kidney failure. Whereas 21 (20.6%) respondents who had a family history did not experience kidney failure and experienced chronic kidney failure. Statistical test results *chi square* The results obtained were $p = 0.000 < 0.05$, then H_0 was rejected, which means that there is a relationship between family history and the incidence of chronic kidney failure in the hemodialysis room at the Dumai City General Hospital.

Table 7 Relationship between UTI history and chronic kidney failure in the hemodialysis room

No	UTI history	Chronic Renal Failure		Total	%	α	$p.s$ -value
		F	%				
1	There is	80	78.4	80	78.4	0.05	0.000
2	There isn't any	22	21,6	22	21,6		
Total		102	100	102	100		

Based on table 7 , it was found that out of 102 respondents, 80 (78.4%) respondents had a history of UTI and chronic kidney failure. Meanwhile, 22 (21.6%) respondents did not experience a UTI and experienced chronic kidney failure. Statistical test results *chi square* the results obtained are $p = 0.000 < 0.05$, then H_0 is rejected, which means that there is a historical factor relationship

Table 8 Relationship between BSK history factors and chronic kidney failure in the hemodialysis room

No	BSK history	Chronic Renal Failure		Total	%	α	$p.s$ -value
		f	%				
1	There is	81	79.4	81	79.4	0.05	0.000
2	There isn't any	21	20,6	21	20,6		
Total		102	100	102	100		

Based on table 8 , it was found that out of 102 respondents, 81 (79.4%) respondents had BSK and had chronic kidney failure. Meanwhile, 21 (20.6%) respondents did not experience BSK and had chronic kidney failure.

The results of the chi square statistical test showed that the value of $p = 0.000 < 0.05$, then H_0 was rejected, which means that there is a relationship between the history of BSK and the incidence of chronic kidney failure in the hemodialysis room at the Dumai City General Hospital.

Table 9 Relationship between DM History and Chronic Kidney Failure in the Hemodialysis Room

No	DM history	Chronic Renal Failure		Total	%	α	$p.s$ -value
		f	%				
1	There is	79	77.5	79	77.5	0.05	0.000
2	There isn't any	23	22.5	23	22.5		
Total		102	100	102	100		

Based on table 9 , it was found that out of 102 respondents, 79 (77.5%) respondents had DM and had chronic kidney failure. As well as 23 (22.5%) respondents who did not have DM and had chronic kidney failure.

The results of the chi square statistical test obtained the results of $p = 0.000 < 0.05$, then H_0 was rejected, which means that there is a relationship between the history of DM and the incidence of chronic kidney failure in the hemodialysis room at Dumai City Hospital.

Table 10 Relationship between factors with a history of hypertension and chronic kidney failure in the hemodialysis room

No	History of Hypertension	Chronic Renal Failure		Total	%	α	$p.s$ -value
		f	%				
1	There is	76	74.5	76	74.5	0.05	0.000
2	There isn't any	26	25.5	26	25.5		
Total		102	100	102	100		

Based on table 10 , it was found that out of 102 respondents, 76 (74.5%) respondents had hypertension and had chronic kidney failure. Meanwhile, 26 (25.5%) respondents did not have hypertension and had chronic kidney failure.

The results of the chi square statistical test showed that the value of $p = 0.000 < 0.05$, then H_0 was rejected, which means that there is a relationship between the history of hypertension and the incidence of chronic kidney failure in the hemodialysis room at the Dumai City General Hospital.

Table 2 Relationship between history of drug consumption and chronic kidney failure in the hemodialysis room

No	History Consuming Drugs	of Chronic Renal Failure		Total	%	α	<i>p.s-value</i>
		f	%				
1	There is	77	75.5	77	75.5	0.05	0.000
2	There isn't any	25	24.5	26	25.5		
Total		102	100	102	100		

Based on table 2, it was found that out of 102 respondents, 77 (75.5%) respondents who consumed drugs experienced chronic kidney failure. Meanwhile, 25 (24.5%) respondents did not consume drugs and experienced chronic kidney failure. The results of the chi square statistical test obtained the results of $p = 0.000 < 0.05$, then H_0 was rejected, which means that there is a relationship between the history of taking drugs and the incidence of chronic kidney failure in the hemodialysis room at Dumai City Hospital.

Table 11 Relationship between smoking history and chronic kidney failure Hemodialysis Room

No	Smoking History	Chronic Renal Failure		Total	%	α	<i>p.s-value</i>
		f	%				
1	There is	73	71.6	73	71.6	0.05	0.000
2	There isn't any	29	28,4	29	28,4		
Total		102	100	102	100		

Based on table 11, it was found that out of 102 respondents, 73 (71.6%) respondents had a history of smoking and experienced chronic kidney failure. Meanwhile, 29 (28.4%) respondents did not have a history of smoking and experienced chronic kidney failure. The results of the chi square statistical test showed that the value of $p = 0.000 < 0.05$, then H_0 was rejected, which means that there is a relationship between the smoking history factor and the incidence of chronic kidney failure in the hemodialysis room at the Dumai City General Hospital.

Tabel 12 Relationship between history of alcohol consumption and chronic kidney failure in the hemodialysis room

No	History Consuming Alcohol	of Chronic Renal Failure		Total	%	α	<i>p-value</i>
		f	%				
1	There is	26	25,5	26	25,5	0,05	0,552
2	There isn't any	76	74,5	76	74,5		
Total		102	100	102	100		

Based on table 12, it was found that out of 102 respondents, 26 (25.5%) respondents had a history of consuming alcohol and experienced chronic kidney failure. Meanwhile, 76 (74.5%) respondents had no history of consuming alcohol and had chronic kidney failure. The results of the chi square statistical test showed that the value of $p=0.552 > 0.05$, then H_0 is accepted, which means that there is no relationship between the history of alcohol consumption and the incidence of chronic kidney failure in the hemodialysis room at the Dumai City General Hospital

Table 13 Correlation between History of Supplementary Drinks and Chronic Kidney Failure in the Hemodialysis Room

No	History of Supplementary Drinks	Chronic Renal Failure		Total	%	α	$p.s$ -value
		f	%				
1	There is	75	73.5	75	73.5	0.05	0.000
2	There isn't any	27	26.5	27	26.5		
Total		102	100	102	100		

Based on table 13 , it was found that out of 102 respondents, 75 (73.5%) respondents had a history of consuming supplementary drinks and experienced chronic kidney failure. Meanwhile, 27 (26.5%) respondents had no history of consuming supplementary drinks and had chronic kidney failure. The results of the chi square statistical test showed that the value of $p = 0.000 < 0.05$, then H_0 was rejected, which means that there is a relationship between the history of consuming supplementary drinks and the incidence of chronic kidney failure in the hemodialysis room at the Dumai City General Hospital.

Table 14 Relationship between history of water and chronic kidney failure in the hemodialysis room

No	White History	Water	Chronic Renal Failure		Total	%	α	$p.s$ -value
			f	%				
1	Lots		54	52,9	54	52,9	0.05	0.000
2	A little		48	47,1	48	47,1		
Total			102	100	102	100		

Based on table 14, it was found that out of 102 respondents, 54 (52.9%) respondents had a history of drinking lots of water and experienced chronic kidney failure. Meanwhile, out of 48 (47.1%) respondents who did not have a history of drinking little water and experienced chronic kidney failure. The results of the chi square statistical test obtained the results of $p = 0.000 < 0.05$, then H_0 was rejected, which means that there is a relationship between the history of drinking water and the incidence of chronic kidney failure in the hemodialysis room at the Dumai City General Hospital.

Based on the results of the study, it was found that out of 102 respondents, 62 (100%) respondents were > 60 years old, with each 53(93.5%) of respondents had chronic kidney failure

and as many as 4 (6.5%) of respondents had terminal kidney failure. Meanwhile, out of 40 (100%) respondents who were aged ≤ 60 years, 22 (55%) each had chronic kidney failure and 18 (45%) had terminal kidney failure.

The results of the chi square statistical test showed that the value of $p = 0.000 < 0.05$, then H_0 was rejected, which means that there is a relationship between the age factor and the incidence of chronic kidney failure in the hemodialysis room at the Dumai City General Hospital.

The results of this study are in line with research conducted by Arifa, Azam and Handayani (2017) which showed that there was a relationship between the age factor and the incidence of chronic kidney failure. Research conducted by Gonzalez et al (2017) also found that there was a relationship between age and the incidence of chronic kidney failure.

Increasing age will affect the anatomy, physiology and cytology of the kidneys (Tjekyan, 2014). After the age of 30 years, the kidneys will atrophy and the thickness of the renal cortex will decrease by about 20% every decade. Other changes that will occur with age include thickening of the glomerular basement membrane, expansion of the glomerular mesangium and the occurrence of extracellular matrix protein deposits causing glomerulosclerosis (Tjekyan, 2014).

According to the researchers, with the majority of ages experiencing chronic kidney failure over 60 years, this indicates that there is a decrease in the function of the body's organs, especially the kidneys. The kidneys experience a decrease in function so that they are no longer able to secrete urine and metabolic waste left out of the body because the kidneys are unable to filter substances in the body which is caused by damage to the tissues in the kidney organs.

Relationship between Gender and Chronic Renal Hemodialysis Room

Based on the results of the study it was found that out of 102 respondents, 74 (100%) of the respondents were male, with each 62 (83.3%) of respondents had chronic kidney failure and as many as 12 (16.2%) of respondents had terminal kidney failure. Meanwhile, of the 28 (100%) respondents who were female, 18 (64.3%) each had chronic kidney failure and 10 (35.7%) had terminal kidney failure.

The results of the chi square statistical test showed that the value of $p = 0.033 < 0.05$, then H_0 was rejected, which means that there is a relationship between the sex factor and the incidence of chronic kidney failure in the hemodialysis room at the Dumai City General Hospital.

This study is in line with research conducted by Sutopo (2016) where there is a relationship between gender and the incidence of chronic kidney failure ($p=0.005$). The results of research conducted by Arifa, Azam and Handayani (2017) show that there is a relationship between gender and the incidence of chronic kidney failure. Gonzales, et al. (2017) also proved that there is a relationship between gender and a decrease in eGFR values.

The results of the study also found that more men had chronic kidney failure than women. Statistically there is a significant relationship between male and female gender with the incidence of chronic kidney disease in hemodialysis patients. Clinically, men have a risk of experiencing chronic kidney disease 2 times greater than women. This is because women pay more attention to health and maintain a healthy lifestyle than men, so men are more susceptible to chronic kidney disease than women (Pranandari 2015).

According to Friends of the Kidneys (2010), the lifestyle of men who like to smoke and drink coffee, where in general CRF is preceded by hypertension and some others suffer from strokes, these diseases can be caused by smoking and consumption of caffeine. Prolonged hypertension can be a risk factor for CKD.

According to the researchers' assumptions, gender, especially men, pays less attention to their health level. There are many causative factors that influence men's health status, such as work, lifestyle, diet, comorbidities (DM and hypertension) and behavior.

Relationship between Education Level and Chronic Kidney Hemodialysis Room

Based on the research results, it was found that out of 102 respondents, 57 (100%) respondents had low education, with each 55 (96.5%) of respondents had chronic kidney failure and as many as 2 (3.5%) of respondents had terminal kidney failure. Meanwhile, 33 (100%) respondents had secondary education, with 18 (54.5%) each having chronic kidney failure and 15 (45.5%) having terminal kidney failure. Then, out of 12 (100%) highly educated respondents, with each as much 7 (58,3%) of respondents had chronic kidney failure and as many as 5 (41.7%) of respondents had terminal kidney failure

The results of the chi square statistical test showed that the value of $p = 0.000 < 0.05$, then H_0 was rejected, which means that there is a relationship between educational factors and the incidence of chronic kidney failure in the hemodialysis room at the Dumai City General Hospital.

The results of this study are in line with research conducted by Sutopo (2016) where there is a relationship between education level and the incidence of chronic kidney failure. The results of a study conducted by Umayah (2016) showed that there was a relationship between education level and patient compliance in limiting fluid intake in patients with chronic kidney failure ($p=0.019$). Research conducted by Ismail et al (2012) with the subject of chronic kidney failure patients at DR. Wahidin Sudirohusodo Makassar showed that there was a relationship between education, knowledge and motivation with dietary adherence in chronic kidney failure patients.

The level of education is one element that is often seen in relation to morbidity and mortality rates, because it can affect various aspects of life including health care. The higher a person's education level, it is hoped that exposure to disease can also decrease (Smeltzer et al, 2010).

Education is a planned process of changing behavior in individuals, groups or communities to be more independent in achieving healthy living goals. Education is a learning process for individuals, groups, or communities from not knowing about the value of health to knowing, and from being unable to deal with health problems on their own to becoming independent (Notoatmodjo, 2010).

According to the assumptions of researchers, the level of education can be related to patient knowledge, especially about maintaining health. The higher the education level of a person, the more information will be obtained and the easier it will be to modify the degree of health.

Relationship of Family History Factors with Chronic Renal Failure Incidence Hemodialysis Room

Based on the results of the study it was found that out of 102 respondents, 81 (100%) respondents had a family history of kidney failure, with each 71 (87.7%) of respondents had chronic kidney failure and as many as 10 (12.3%) of respondents had terminal kidney failure. Meanwhile, 21 (100%) respondents who had a family history did not experience kidney failure, with 9 (42.9%) each having chronic kidney failure and 12 (57.1%) having terminal kidney failure.

The results of the chi square statistical test showed that the value of $p = 0.000 < 0.05$, then H_0 was rejected, which means that there is a relationship between family history and the incidence of chronic kidney failure in the hemodialysis room at the Dumai City General Hospital. The results of this study are in line with the results of a study conducted by Sutopo (2016) where there is a relationship between family history and the incidence of chronic kidney failure ($p=0.03$). The results of research conducted by Pranandari and Supadmi (2015) also show that there is a relationship between family factors and the incidence of chronic kidney failure.

Genetics is one of the predisposing factors for diabetic nephropathy and chronic glomerulus nephritis. Immunoglobulin A (IgA) nephropathy, is the most common cause of glomerulonephritis in developing countries, 1 in 7 patients has a relationship between a family history of chronic kidney disease and chronic kidney disease. The thing that underlies the existence of mono-genetic disorders in patients with chronic kidney disease is Polycystic Kidney Disease (PKD), which is inherited in an autosomal dominant hereditary manner (Scolari et al, 2017).

According to Price & Wilson (2012) the four main risk factors in the development of chronic kidney disease or Chronic Kidney Disease (CKD) are age, race, gender, and family history. The incidence of diabetic kidney disease increases greatly with age. Chronic kidney disease caused by hypertensive nephropathy is 6.2 times more common in African Americans than Caucasians. Overall, the incidence of chronic kidney disease is greater in men (56.3%) than women (43.7%), although systemic diseases that cause chronic kidney disease (such as type 2 diabetes mellitus and SLE) are more common in women. Ultimately, family history is a risk factor in the development of diabetes and hypertension.

Relationship between UTI history and chronic kidney failure Hemodialysis Room

Based on table 4.11 it was found that out of 102 respondents, as many as 81 (100%) respondents had UTI, with each 72 (90%) of respondents had chronic kidney failure and as many as 8 (10%) of respondents had terminal renal failure. Meanwhile, of the 22 (100%) respondents who had no UTI, 8 (36.4%) each had chronic kidney failure and 14 (63.6%) had terminal kidney failure.

The results of the chi square statistical test obtained the results of $p = 0.000 < 0.05$, then H_0 was rejected, which means that there is a relationship between the history of UTI and the incidence of chronic kidney failure in the hemodialysis room at Dumai City Hospital. The results of a study conducted by Tjekyan (2014) found a significant relationship between chronic kidney disease and urinary tract infections ($p=0.004$, $OR=4.678$, $95\% CI = 1.589-13.777$), which means that respondents with a history of urinary tract infections had factors 4 times greater risk of developing chronic kidney disease. Likewise, research conducted by Sutopo (2016) also stated that there was a relationship between urinary tract infections and the incidence of chronic kidney failure.

Urinary tract infection is a risk factor for chronic kidney disease. The occurrence of urinary tract infections accompanied by Vesico Ureteral Reflux (RVU) will increase the formation of scars in the kidneys which will cause a decrease in kidney function. People with a history of urinary tract infections are 5 times more at risk of developing chronic kidney disease than people without a history of urinary tract infections (Price & Wilson, 2012).

Relationship between BSK history factors and chronic kidney failure Hemodialysis Room

Based on the research results, it was found that out of 102 respondents, as many as 80 (100%) respondents had UTI, with each 72 (90%) of respondents had chronic kidney failure and as many as 8 (10%) of respondents had terminal renal failure. Meanwhile, of the 22 (100%) respondents who did not have a UTI, 8 (36.4%) each had chronic kidney failure and 14 (63.6%) had terminal kidney failure.

The results of the chi square statistical test obtained the results of $p = 0.000 < 0.05$, then H_0 was rejected, which means that there is a relationship between the history of UTI and the incidence of chronic kidney failure in the hemodialysis room at Dumai City Hospital. According to a study conducted by Tjekyan (2014) there was a significant relationship between chronic kidney disease and a history of urinary tract stones ($p \text{ value} = 0.011$, $OR = 4.926$, $95\% CI = 1.435-16.907$). Meanwhile, based on a study conducted by Wardani (2014) patients who have a history of recurrent urinary tract stones 3 times or more have an increased risk of developing chronic kidney disease ($OR = 2.44$ with $p \text{ value} = 0.04$).

Common causes of obstruction are renal or urethral scarring, neoplasms, stones, prostatic hypertrophy, congenital abnormalities of the bladder neck and urethra, and urethral stricture. Obstruction to the outflow of urine that is located proximal to the urinary bladder can cause a

buildup of pressurized fluid in the renal pelvis and ureters. This can cause severe atrophy of the renal parenchyma which ultimately results in chronic renal failure (Wilson & Price, 2012).

Obstruction caused by urinary tract stones can cause an increase in intratubular pressure followed by vasoconstriction of blood vessels resulting in ischemia of the kidney. Long-term ischemia can cause glomerulosclerosis, tubular atrophy and interstitial fibrosis. Complete obstruction of the kidney within 24 hours will result in a permanent loss of nephron function by 15% (Black & Hawk, 2014).

Correlation between DM History Factors and Chronic Kidney Failure Hemodialysis Room

Based on this research, it was found that out of 102 respondents, 79 (100%) respondents had DM, with each 72 (91.1%) of respondents had chronic kidney failure and as many as 7 (8.9%) of respondents had terminal kidney failure. Meanwhile, of the 23 (100%) respondents who did not have DM, 8 (34.8%) each had chronic kidney failure and 15 (65.2%) had terminal kidney failure.

The results of the chi square statistical test obtained the results of $p = 0.000 < 0.05$, then H_0 was rejected, which means that there is a relationship between the history of DM and the incidence of chronic kidney failure in the hemodialysis room at Dumai City Hospital. The results of this study are in line with a study conducted by Widyantara (2016) which showed that there was a significant relationship between diabetes mellitus and the incidence of chronic kidney failure in hemodialysis patients at Tugurejo General Hospital Semarang with a value ($p=0.004$; $OR=5.333$) or patients suffering from diabetes mellitus. have a 5.333 times chance of experiencing chronic kidney failure compared to patients who do not suffer from diabetes mellitus. The results of this study are in line with the results of Sahid's study (2012) which stated that there was a relationship between the duration of diabetes and the incidence of kidney failure in patients at Moewardi Hospital, Surakarta.

High levels of sugar in the blood in people with diabetes mellitus make the kidneys have to work harder in the process of filtering blood, and cause leakage in the kidneys. Initially, the patient will experience leakage of albumin protein excreted by the urine, then it develops and results in a decrease in the filtering function of the kidneys. At that time, the body will get a lot of waste due to decreased kidney function. If this continues, it will result in chronic kidney failure (Muttaqin & Kumalasari, 2010).

Correlation between history of hypertension and chronic kidney failure Hemodialysis Room

Based on the results of the study it was found that out of 102 respondents, 76 (100%) respondents had hypertension, with each 71 (93.4%) of respondents had chronic kidney failure and as many as 5 (6.6%) of respondents had terminal kidney failure. Meanwhile, of the 26 (100%) respondents who did not have hypertension, 9 (34.6%) each had chronic kidney failure and 17 (65.4%) had terminal kidney failure.

The results of the chi square statistical test obtained the results of $p = 0.000 < 0.05$, then H_0 was rejected, which means that there is a relationship between the history of hypertension and the incidence of chronic kidney failure in the hemodialysis room at the Dumai City General Hospital. The results of this study are in line with Pranandari and Supadmi's research (2015) regarding the risk factors for chronic kidney failure in the hemodialysis unit at Wates Kulon Progo General Hospital showing that a history of hypertension has a relationship and is a risk factor for chronic kidney disease (OR=4.044). The results of a study conducted by Sutopo (2016) showed that there was a relationship between a history of hypertension and the incidence of chronic kidney disease ($p=0.000$; OR=14.50).

Hypertension is a major risk factor for heart disease, congestive heart disease, stroke, vision problems and kidney disease. Clinically, patients with a history of hypertension risk factors have a risk of developing chronic kidney disease 3.2 times greater than patients without a history of hypertension risk factors. Increased blood pressure is associated with the incidence of chronic kidney disease (Hsu et al., 2005). Hypertension can exacerbate kidney damage by increasing intraglomerular pressure which causes structural and functional disturbances in the glomerulus. High intravascular pressure flows through the afferent arteries into the glomerulus, where the afferent arteries experience constriction due to hypertension (Susalit, 2003). Besides that, Hypertension will cause the work of the heart to increase and damage the blood vessels of the kidneys. Damage to the renal blood vessels results in impaired filtration and increases the severity of hypertension (Saad, 2014).

Correlation between History of Consuming Drugs and Chronic Kidney Failure Hemodialysis Room

Based on the results of the study it was found that out of 102 respondents, 77 (100%) respondents consumed drugs, with each 69 (89.6%) of respondents had chronic kidney failure and as many as 8 (10.4%) of respondents had terminal renal failure. Meanwhile, of the 25 (100%) respondents who did not take drugs, 11 (44%) each had chronic kidney failure and 14 (56%) had terminal kidney failure.

The results of the chi square statistical test obtained the results of $p = 0.000 < 0.05$, then H_0 was rejected, which means that there is a relationship between the history of taking drugs and the incidence of chronic kidney failure in the hemodialysis room at Dumai City Hospital. The results of this study are in line with Sutopo's study (2016) which showed that there was a relationship between a history of drug use and chronic kidney disease ($p=0.003$; OR=7.25; 95% CI=2.002-29.826).

Medicine is a single ingredient or a mixture that is used for the inside and outside of the body to prevent, relieve and heal but has side effects that can trigger the emergence of new diseases (Suharmiati & Handayani, 2006). Several types of drugs are known to cause decreased kidney function or kidney damage by various mechanisms. These drugs are termed nephrotoxic. Drug nephrotoxicity will arise associated with high drug levels in plasma (Arsono, 2015).

The use of drugs for a certain period of time can trigger kidney disease, both acute kidney disease and chronic kidney disease. Some drugs that can trigger kidney disease include aminoglycosides, cisplatin and amphotericin B, penicillin, NSAIDs, ACE inhibitors, and others. In accordance with the function of the kidneys, namely filtering or cleaning the blood. The part of the kidney that performs this function is the nephron. Excessive use of drugs can increase the incidence of kidney damage or nephropathy. Nephropathy is nephron damage due to the use of drugs that are nephrotoxic. If a person's body has damaged nephrons, toxic buildup will occur in the body. The more toxins in the body, the more it will increase the work of the kidneys,

Relationship between smoking history and chronic kidney failure in Hemodialysis Room

Based on the results of the study it was found that out of 102 respondents, 77 (100%) respondents had a history of smoking, with each 70 (95.9%) of respondents had chronic kidney failure and as many as 3 (4.1%) of respondents had terminal renal failure. Meanwhile, of the 29 (100%) respondents who had no smoking history, 10 (34.5%) each had chronic kidney failure and 19 (65.5%) had terminal kidney failure.

The results of the chi square statistical test showed that the value of $p = 0.000 < 0.05$, then H_0 was rejected, which means that there is a relationship between the smoking history factor and the incidence of chronic kidney failure in the hemodialysis room at the Dumai City General Hospital. The results of this study are in line with research conducted by Pranandari and Supadmi (2015) regarding the risk factors for chronic kidney failure in the hemodialysis unit at RSUD Wates Kulon Progo showing smoking history (OR=1.987) is statistically related and is a risk factor for chronic kidney disease.

Patients with chronic kidney disease on hemodialysis who have a history of smoking have a risk of developing chronic kidney disease 2 times greater than patients without a history of smoking. The effects of acute phase smoking can increase sympathetic race which will result in increased blood pressure, tachycardia and accumulation of catecholamines in the circulation. In the acute phase, some blood vessels also often experience vasoconstriction, for example in the coronary arteries, so that in acute smokers it is often followed by an increase in renal vascular resistance resulting in a decrease in glomerular filtration rate and filter fraction (Black & Hawk, 2014).

Correlation between History of Consuming Alcohol and Chronic Renal Failure In Hemodialysis Room

Based on the research results, it was found that out of 102 respondents, 26 (100%) respondents had a history of consuming alcohol, with each 20 (95.9%) of respondents had chronic kidney failure and as many as 6 (23.1%) of respondents had terminal kidney failure. Meanwhile, of the 76 (100%) respondents who had no history of consuming alcohol, 60 (78.9%) each had chronic kidney failure and 16 (21.1%) had terminal kidney failure.

The results of the chi square statistical test showed that the value of $p = 0.828 > 0.05$, meaning that there is no relationship between the history of alcohol consumption and the incidence of chronic kidney failure in the hemodialysis room at the Dumai City General Hospital. This study is in line with the research of Pranandari and Supadmi (2015) which showed that there was no relationship between a history of alcohol consumption and the incidence of chronic kidney disease ($p=1.000$; $OR=2.057$; $95\% CI=0.178-23.723$).

Alcohol if consumed has a toxic effect on the body either directly or indirectly (Panjaitan, 2003). One result of excessive alcohol (ethanol) consumption is an increased risk of kidney disease and liver disease. Consuming ethanol is very dangerous because the chemical reaction of this compound forms a strong nephrotoxic substance that causes dysfunction and cell death (necrosis) in proximal tubular cells. The results of this study were conducted on experimental animals of white wistar rats, which were given 20%, 30%, 40%, and 50% alcohol as much as 2 ml/day for 15 days, found necrosis of the proximal tubule cells of the kidney (Gunawan, 2010).

According to the researchers' assumptions, the number of patients who had consumed alcoholic beverages in this study was only a small number. However, it can be seen that patients who have consumed alcoholic beverages all experience CRF and GGT.

Correlation between History of Supplementary Drinks and Chronic Kidney Failure Hemodialysis Room

Based on the results of the study, it was found that out of 102 respondents, 75 (100%) of respondents had a history of consuming supplementary drinks, with each 66(88%) of respondents had chronic kidney failure and as many as 9 (12%) of respondents had terminal renal failure. Meanwhile, out of 27 (100%) respondents who had no history of consuming supplementary drinks, 14 (51.9%) each had chronic kidney failure and 13 (48.1%) had terminal kidney failure.

The results of the chi square statistical test showed that the value of $p = 0.000 < 0.05$, then H_0 was rejected, which means that there is a relationship between the history of consuming supplementary drinks and the incidence of chronic kidney failure in the hemodialysis room at the Dumai City General Hospital. The results of research conducted by Lathifah (2016) in Surakarta also showed that there was a significant relationship between consumption of energy drinks and the incidence of CKD in adulthood with a value ($p=0.001$). People who consume supplement drinks have 8.1 times the risk of experiencing CKD compared to people who do not consume supplement drinks.

Health supplements or also known as Dietary Supplements are health products that contain one or more substances that are nutritional or medicinal, nutritional in nature including vitamins, minerals and amino acids, while those that are medicinal are generally taken from plants or animal body tissues that have properties as drugs (Vitahealth, 2004).

Supplementary drinks contain several harmful substances, one of which is taurine (an average of 1,000 mg per pack). Taurine is a detoxifying amino acid that has the same effect as glycine

in neutralizing all types of toxins (xenobiotics). If consuming taurine in supplements exceeds the threshold, which is as much as 50-100 mg, it can cause the kidneys to work harder (Mukhlisin, 2011).

Relationship between history of white water and the incidence of chronic kidney failure Hemodialysis Room

Based on table 4.20, it was found that out of 102 respondents, 54 (100%) respondents had a history of drinking lots of water, with each 53 (98.1%) of respondents had chronic kidney failure and as many as 1 (1.9%) of respondents had terminal kidney failure. Meanwhile, out of 48 (100%) respondents who had no history of drinking a little water, 27 (56.2%) each had chronic kidney failure and 21 (43.8%) had terminal kidney failure.

The results of the chi square statistical test obtained the results of $p = 0.000 < 0.05$, then H_0 was rejected, which means that there is a relationship between the history of drinking water and the incidence of chronic kidney failure in the hemodialysis room at the Dumai City General Hospital. The results of this study are in line with Sutopo's study (2016) which showed a relationship between a history of drinking water intake and the incidence of chronic kidney disease ($p=0.247$; $OR=2.370$; $95\% CI=0.722-7.787$)

Water is a very important fluid in the body. Approximately 68% of body weight consists of water. Adequate drinking water intake every day is the best way to care for the body. Water as a fluid store in the body, if the body does not receive sufficient amounts of water, namely 2 liters/day or 8 glasses per day, the body will become dehydrated. It starts with decreased body water reserves which result in health problems (Siregar, 2011).

Vital organs are very sensitive to lack of water, one of which is the kidney. Kidneys cannot function properly if there is not enough water. In the process of filtering toxic substances, the kidneys do it more than 15 times every hour, this requires a large amount of water before it is circulated into the blood. If there is not enough fluid or not drinking enough, the kidneys cannot work properly, so the materials circulating in the body cannot be removed properly, which can cause blood poisoning and cause kidney disease (Siregar, 2011).

CONCLUSION

- a. There is a relationship between age and the incidence of chronic kidney failure in the hemodialysis room at Dumai City General Hospital ($p=0.000$).
- b. There is a relationship between gender and the incidence of chronic kidney failure in the hemodialysis room at Dumai Hospital ($p=0.033$).
- c. There is a relationship between educational factors and the incidence of chronic kidney failure in the hemodialysis room at Dumai City General Hospital ($p=0.000$).
- d. There is a relationship between family history and the incidence of chronic kidney failure in the hemodialysis room at Dumai City General Hospital ($p=0.000$).
- e. There is a relationship between the history of UTI and the incidence of chronic kidney failure in the hemodialysis room at Dumai City General Hospital ($p=0.000$).

- f. There is a relationship between the history of BSK and the incidence of chronic kidney failure in the hemodialysis room at Dumai City General Hospital ($p=0.000$).
- g. There is a relationship between the history of DM and the incidence of chronic kidney failure in the hemodialysis room at Dumai City General Hospital ($p=0.000$).

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