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CORRELATION BETWEEN FATIGUE AND PHYSICAL ACTIVITY IN CHRONIC KIDNEY DISEASE PATIENTS EXPERIENCING HEMODIALYSIS

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Abstract

Chronic kidney disease is a disease that results in a decrease in kidney function so that it cannot filter blood and the remains of the body's metabolism. One of the renal replacement therapies for patients with chronic kidney disease is hemodialysis therapy. Hemodialysis therapy is a kidney replacement therapy using a dialysis machine, this therapy has side effects, one of which is fatigue. This fatigue incident causes the patient's physical activity to be reduced or decreased. Physical activity is a movement or activity that requires energy; one factor that disrupts physical activity is fatigue. This study aimed to determine the correlation between fatigue and physical activity in patients with chronic kidney disease experiencing the hemodialysis method used. The technique used in this study is a correlation study with research design cross-sectional with a sample of 88 respondents using the purposive sampling technique. Data collection using questionnaire FSS (Fatigue Severity Scale) and IPAQ (International Physical Activity Questionnaire). Data analysis using Chi-Square correlation test with SPSS 25 for windows.The results showed that almost all of the respondents experienced fatigue as many as 62 respondents (70.5%) and had a low level of physical activity , as many as 47 respondents (53.4%). After statistical analysis, the value of Pearson Chi-Square 51,983 with Asymptotic Significance (2-sided) 0.000 (<0.05) means that there is a rejection of H0 and acceptance of Ha, so there is a significance. The correlation between fatigue and physical activity in chronic kidney disease patients experiencing hemodialysis therapy at the Blambangan Hospital, Banyuwangi.The level of fatigue experienced by respondents causes trouble in daily activities or physical activity of respondents undergoing therapy hemodialysis.

Keywords: *Chronic Kidney Disease, Fatigue, Physical Activity*

Introduction

Hemodialysis is a treatment or therapy for patients with chronic kidney disease to maintain life. This therapy has side effects for sufferers, which occur in physical activity or the patient's physical and psychological condition (Kementrian Kesehatan RI, 2018). Fatigue is an unpleasant subjective feeling evidenced by weakness and limited energy. Fatigue can occur in someone with disorders of the nervous system, metabolism, and chronic inflammation (Nugraha & Ramdhanie, 2018; Asman, 2020). Physical activity is body movements that increase energy expenditure above the basal metabolic level. This needs to be done regularly to feel the benefits (Dian, Novita Putri, 2018). The frequency of hemodialysis therapy is 2-3 times a week and carried out for a lifetime is a supporting factor that causes patients to experience fatigue and affects their usual physical activities.

According to the World Health Organization (WHO), in 2011, it was identified that 20%-30% of low physical activity was one of the factors causing chronic disease and a cause of death globally. In 2017 WHO stated that as many as 6% of the reasons for highest mortality are due to not doing physical activity. According to RISKESDAS 201,8 as many as <50% do not do physical activity in Indonesia. A previous study discussing physical activity in hemodialysis patients found that the patient's physical activity was 20%-50% lower. The World Health Organization (WHO) in 2015 stated that the incidence of chronic kidney disease in the world was 730,000,000 people, while chronic kidney disease patients experiencing hemodialysis therapy were estimated at 1.5 million people worldwide. This figure is estimated to increase by 8% annually. Based on data from the Basic Health Research (Riskesdas) in 2018, the prevalence of chronic kidney disease patients in Indonesia was 499,800 people. The Indonesian Renal Register (IRR) in 2015 showed me that most CKD patients who registered to the hemodialysis unit continued to increase by 10% yearly. In 2016, 98% of patients with CKD experienced hemodialysis therapy; the remaining 2% experienced peritoneal dialysis. In 2017 patients undergoing

hemodialysis increased to 77,892 people (Putri, E. et al., 2020). The latest data reset from the IRR in 2018 stated an increase in active patients and new patients experiencing hemodialysis compared to 2017. In 2018, there were 66,433 new patients, while 132,142 active patients. The number of new patients in East Java Province in 2018 reached 9,607 people (IRR, 2018). A numbSeveraldialysis Patients in Blambangan Hospital, Banyuwangi in 2020, as many as 1,773 people. The Preliminary Study on November 10, 2021, on hemodialysis patients at the Blambangan Hospital, Banyuwangi with observation and interview methods, obtained results from 10 respondents complaining of fatigue and five people doing no physical activity at all, two people doing light physical activity, and three people doing moderate physical activity. Based on data in the hemodialysis room, the usual number of patients from August to October 2021 was 112 people experiencing hemodialysis therapy.

Haemodialysis therapy will cause side effects, one of which is fatigue. According to Dermawan et al. (2019), the results of fatigue experienced are the lack of a person's ability to carry out daily activities or physical activities and disruption of the survival of patients undergoing hemodialysis. This happens because of the side effects of hemodialysis, one of which is anemia the patient experiences weakness, resulting in a lack of ability to carry out daily physical activities. Haemodialysis patients who don't do physical activity will increase morbidity and mortality, such as an increased risk of cardiovascular disease which is the highest complication to cause death in patients experiencing hemodialysis therapy in Indonesia (Rosiah et al., 2017).

Treatment performed for physical activity in hemodialysis patients is to assist patients in fulfilling their needs for physical activity that is considered heavy or supports the patient to carry out physical activity according to their abilities (Rosiah et al., 2017). In addition, a study conducted by Laoli, D et al (2019) showed that patients who do physical exercise more often will increase the patient's muscle strength, so that patients with chronic kidney disease experiencing hemodialysis therapy can perform physical activities such as work, exercise, or just walking around as usual. Physical exercise is ROM (Range Of Motion). Providing support and explanations about the importance of physical activity will also help patients to be motivated and enthusiastic about doing physical activities according to their abilities. The National Kidney Foundation (2019) states that patients with chronic kidney disease may engage in sustained light exercises such as walking, swimming, cycling, aerobic exercise, or other mild sports but can increase muscle strength. This exercise does not need to be too long, just 30 minutes, or you can stop if you are tired. These things can be a solution to increasing physical activity in patients experiencing hemodialysis therapy. This makes researchers interested in research "The Correlations between Fatigue and Physical Activity in Chronic Kidney Disease Patients Experiencing Haemodialysis at Blambangan Hospital Banyuwangi in 2022".

Methods

Research is quantitative analytics with a study cross-sectional. The research location was at a Blambangan Hospital, Banyuwangi. The population of this study is 112 people with experiencing hemodialysis therapy, and the sample is 88 people with technique sampling is purposive sampling. Data collection uses interviews using questionnaires, that is FSS (Fatigue Severity Scale) to measure fatigue, FSS has validity is r=0,349 and reliability with Cronbach's Alpha is 0,880 and IPAQ (International Physical Activity Questionnaire) to measure Physical Activity, IPAQ hahasalidity is an r=0,40 and reliability with Cronbach's Alpha is a 0,914. Data were analyzed using univariate and bivariate (Chi-Square) with SPSS 25 for windows with α=0,05. In this study, there is no compulsion to become a respondent and the confidentiality of the data is guaranteed.

Results

Respondent characteristics were age, education level, marital status, anemia status, hemodialysis time, frequency, and fatigue. As can be seen in Table 1

Table 1. The Characteristics of Respondents

No	Characteristic	Fatigue				Physical Activity					
		Fatigue		Not Fatigue		Low		Moderate		High	
		N	(%)	N	(%)	N	(%)	N	(%)	N	(%)
1	Age										
	17-25 years	2	3,2	2	8,4	0	0	2	7,7	2	14,3
	26-35 years	1	1,6	1	4,1	1	2,1	0	0	1	7,1
	36-45 years	3	4,7	1	4,1	1	2,1	2	7,7	1	7,1
	46-55 years	22	34,3	11	45,8	18	37,5	9	34,6	6	42,8
	56-65 years	2	37,5	7	29,2	18	37,5	10	38,5	3	21,4
	>65 years	4	18,7	2	8,4	10	20,8	3	11,5	1	7,1
		12									
2	Education Level										
	No School	9	14,1	2	8,4	5	10,4	4	15,4	2	14,3
	Graduated Primary School	20	31,2	8	33,3	16	33.3	9	34,6	3	21,4
	Graduated Junior High School	11	17,2	3	12,5	10	20,9	2	7,7	2	14,4
	Graduated Senior High School	16	25	8	33,3	11	22,9	9	34,6	4	28,5
	Graduated from University	8	12,5	3	12,5	6	12,5	2	7,7	3	21,4
3	Marital Status										
	Unmarried	1	1,6	2	8,3	0	0	1	3,9	2	14,3
	Married	56	87,5	20	83,4	43	89,5	22	84,6	11	78,6
	Widow/Widower	7	10,9	2	8,3	5	10,5	3	11,5	1	7,1
4	Anemia Status										
	Anemia	61	96,8	8	32	46	97,9	18	66,7	5	35,7
	Not Anemia	2	3,2	17	68	1	2,1	9	33,3	9	64,3
5	Hemodialysis Time										
	<12 month	26	40,6	7	29,1	21	43,7	7	26,9	5	35,7
	12-24 month	12	18,8	6	25	8	16,7	7	26,9	3	21,4
	>24 month	26	40,6	11	45,9	19	39,6	12	46,2	6	42,9
6	Hemodialysis Frequency										
	1x/weeks	0	0	0	0	0	0	0	0	0	0
	2-3x/weeks	64	100	24	100	47	100	27	100	14	100
7	Fatigue										
	Fatigue	-	-	-	-	46	97,9	16	59,3	0	0
	Not Fatigue					1	2,1	11	40,7	14	100

Table 2. Correlation Between Fatigue and physical activity

	Value	df	Asymptotic Significance (2-Sided)	95% CI	
				Fatigue	Physical Activity
Pearson Chi-Square	51.983[a]	2	0.000	0.000	0.000
Likelihood Ratio	60.648	2	0.000		
Linear by Linear Association	50.552	1	0.000		
N of Valid Case	88				

Discussions

Fatigue of Chronic Kidney Disease Patients Experiencing Hemodialysis Therapy at Blambangan Hospital Banyuwangi in 2022. Results Based on the research in table 1, almost all patients experiencing hemodialysis therapy at Blambangan Hospital Banyuwangi in 2022 experienced fatigue. This number is 62 respondents (70.5%). Several factors affect fatigue, age, hemodialysis frequency, and anemia status.

The factor that can affect the first fatigue is age, from table 1 shows that the age of respondents experiencing hemodialysis therapy is almost half in the range of 46-55 years, namely 33 respondents (36.5%). Of 88 and 62 respondents, 58 respondents aged >40 experienced fatigue. This result is in line with the research conducted by Maesaroh and Waluyo. A (2020) states that someone aged > 40 years will experience a decrease in organ function so that in this case, there is a progressive decrease in the glomerular rate until the age of 70 years, as much as 50% of the condition. Average and increasing age will also cause a person to have a higher risk of experiencing fatigue. The study by Mesaroh and Waluyo. A (2020) also stated that the growing age of patients undergoing hemodialysis therapy, the more likely they are to experience fatigue.

The next factor influencing fatigue is the length of hemodialysis. Based on table 1, almost half of the respondents (42%) who experienced hemodialysis therapy for >24 months or more than two years amounted to 37 respondents. Of these 37 respondents who experienced fatigue, as many as 26 respondents. This is to Cheek, Salman, and Sulaiman' (2015) theory, which states that most of the clients who experienced hemodialysis therapy had >24 months, as many as 68.3%. Patients who have been on hemodialysis therapy for a long time will have high urea and creatinine levels. High levels of urea and creatinine in the body will cause disturbances in the production of the hormone erythropoietin or red blood cell-forming hormone; this causes red blood cells to decrease, causing fatigue symptoms such as fatigue, fatigue, and lethargy.

The next factor influencing fatigue is the frequency of hemodialysis. Based on table 1, it is stated that all respondents (100%) have hemodialysis frequency 2 times in 1 week, it's 88 respondents, of these 88 respondents who experience fatigue, as many as 64 respondents. This is in line with research conducted by Rahayu, F et al. (2018), which states that almost all respondents (86.6%), totaling 58 respondents, have frequent hemodialysis frequencies, two times in 1 week. Most hemodialysis patients underwent therapy twice a week with a percentage (86.7%) (Putri et al., 2019). The frequency of hemodialysis two times in 1 week carried out by patients with chronic kidney failure can cause several different reactions in each individual, one of which is fatigue. Hemodialysis time of 4 hours/session with a frequency of 2x/week performed by patients with a lifetime is very likely to cause the patient to feel tired.

The next factor related to fatigue is the incidence of anemia experienced. A study by (Maesaroh & Waluyo. 2020) found that all patients undergoing hemodialysis therapy were anemic with an average Hb of 8.7 g/dL. Based on table 1, the results showed that most respondents had anemia, which amounted to 69 respondents (57.5%). Respondents who underwent hemodialysis therapy had very high urea and creatinine levels in their bodies. This excessive urea causes disturbances in hormone production erythropoietin. If there is a disturbance in the production of the hormone erythropoietin, it will cause red blood cells to decrease, and anemia occurs.

Physical Activity of Chronic Kidney Disease Patients Experiencing Hemodialysis Therapy at Blambangan Hospital Banyuwangi in 2022. Table 1 shows that most of the respondents who underwent hemodialysis therapy at the Blambangan Hospital Banyuwangi in 2022 had light physical activity, as many as 47 (53.4%). Factors that affect physical activity in hemodialysis patients are age, frequency of hemodialysis, and fatigue.

Table 1 shows that respondents experiencing hemodialysis therapy are almost half in the range of 46-55 years, 33 respondents (36.5%). Of the 33 respondents, 18 had light physical activity. This light is in line with Heny Kurniawaty (2019) research, the average age of the respondents was more than 40 years, and 75% of patients said that when carrying out activities, they needed family assistance. The patient also mentioned difficulties doing strenuous activities, so the patient only did light activities such as sitting and walking. Someone with an increasingly mature age will experience a decrease in physical capacity in the form of a reduction in mass and muscle strength—the older a person or the increasing age, the lower the physical activity.

The frequency of hemodialysis carried out by respondents is also the cause of disturbed physical activity. Based on diagram 5.5 shows that all 88 respondents have hemodialysis frequency two times a week (100%). Almost half of the 47 respondents had impaired physical activity. In a study conducted (Rahayu, F et al., 2018), it was found that for someone who underwent hemodialysis therapy with a frequency that often resulted in increased stress levels, as many as 20.9% or 14 respondents experienced severe stress. This stress resulted in the disruption of daily activities. Stuart and Gail. W (2016) stated that the frequent routine therapy carried out every week resulted in the respondent's role in everyday life being disrupted so that problems in the position he was given became piled up.

The next factor that affects hemodialysis patients' physical activity is the fatigue the respondents experienced. Table 1 shows that almost all patients undergoing hemodialysis therapy at the Blambangan Hospital Banyuwangi in 2022 experienced high fatigue. This number is 62 respondents (70.5%). Research conducted by (Putri et al., 2019) found that sufferers who experience fatigue will inhibit physical activities usually carried out daily. The research results show that the fatigue caused by the patient interferes with activities, such as working or socializing.

The next factor that affects physical activity is the length of hemodialysis. Table 1 states that almost half of the respondents with a percentage of 34.1%, namely 33 respondents, had hemodialysis time of < 12 months or < 1 year. Of the 33 respondents, 21 had light physical activity with a hemodialysis time of <12 months or <1 year. According to Maesaroh and Waluyo. A (2020), patients undergoing hemodialysis in the first 6-8 months experience a weak condition. A person who undergoes hemodialysis therapy in the first year is prone to shock, stress, and sometimes rejection, causing significant pressure. A person who experiences this tends to have a weak effect on him so that he does not do physical activity or has light physical activity.

Correlations between Fatigue and Physical Activity in Chronic Kidney Disease Patients Experiencing Hemodialysis Therapy at Blambangan Hospital Banyuwangi in 2022. The study results in table 1 show that from 88 respondents, 62 respondents experienced fatigue with light physical activity, as many as 46 respondents, 16 respondents experienced moderate physical activity, and 0 respondents had heavy physical activity. At the same time, the other 26 respondents did not experience fatigue.

The results of calculations using Chi-Square with SPSS, Pearson Chi-Square shows Asymptotic Significance (2-Sided) 0.000 (<0.05); these results indicate that H0 is rejected and Ha is accepted, meaning that there is a significant correlation between fatigue and physical activity in chronic kidney disease patients experiencing hemodialysis therapy at Blambangan Hospital Banyuwangi in 2022.

In this study, of the 62 respondents who were tired, none of them did strenuous physical activity; this is to the theory put forward by Lukbin and Larsen in Sulaiman (2015) that the further impact of fatigue or fatigue in patients experiencing hemodialysis therapy, one of which is impaired physical function in performing daily activities. In his research, Sulaiman (2015) also mentions that complications experienced by hemodialysis patients are uneasy feelings of comfort and fatigue, so disruption of daily activities is often felt during hemodialysis. This is to the results of this study; someone who experiences or has fatigue tends to have a light physical activity, such as only sitting and walking for a short time and even doing activities in bed.

This study also found that 16 respondents who were tired could do the moderate physical activity; this could happen because adaptive coping and good family and environmental support could stimulate the respondents' enthusiasm so that respondents were able to do moderate physical activity. Patients experiencing hemodialysis therapy are susceptible to psychological distress, so family support will also help patients remain enthusiastic so they can carry out physical activities even though they are not as usual (Maesaroh & Waluyo. 2020). Twenty-six respondents did not experience fatigue, and one still had light physical activity. If following the theory, the respondent should be able to do moderate to heavy physical activity because the patient does not have complaints of fatigue. However, this can happen because it is influenced by an ancient age factor or an unacceptable level of family knowledge that prohibits respondents from doing physical activity.

Fatigue in patients experiencing hemodialysis therapy is strongly influenced by a physical condition, level of knowledge, support factors from family and environment, duration of hemodialysis, and frequency of hemodialysis. Someone with excellent physical condition, positive family support, and a sufficient level of knowledge is less likely to experience fatigue. When a person cannot control the tiredness or fatigue experienced and does not have adaptive coping, it will

cause interference with daily physical activities. Fatigue itself will also significantly affect the patient's physical activity. If the patient feels weakness, fatigue, and lethargy, the patient tends to be lazy and no longer has the enthusiasm to do physical activity.

Conclusions

Fatigue in patients with chronic kidney disease experiencing hemodialysis therapy was 62 respondents with 70.5%. Half of the physical activity carried out by respondents was low, namely 47 respondents with 53.4%. After calculating the correlation chi-square test using SPSS 25 for windows, a p-value of 0.000 (<0.05) means a significant correlation between fatigue and physical activity in chronic kidney disease patients experiencing hemodialysis therapy. In future research, it is hoped that further research will be conducted on the effect of physical exercise on increasing physical activity in patients with chronic kidney disease experiencing hemodialysis therapy.

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