

# The Effect Of Intradialytic Exercise On Fatigue In Hemodialysis Patients At Dustira Hospital Cimahi

Pandith Arismunandar, Sada Ukur Br. Barus, Endah Dwi Pangesti

**Abstract:** Chronic kidney disease (CKD) is a decrease of kidney function in a few months or years that require kidney replacement therapy one of which is hemodialysis. Hemodialysis processes that takes  $\pm$  5 hours will cause symptom of fatigue which is a decrease in muscle strength. Interventions that can be done to reduce fatigue in patients CKD with hemodialysis management such as intradialytic exercise which is planned and structured movement exercise to improve one or more aspects of physical fitness using smooth muscle movements and slow movements. The purpose of this study was to determine the effect of intradialytic exercise on fatigue in hemodialysis patients in Dustira Hospital Cimahi. The research method was pre experimental design with one group pretest-posttest design for 4 weeks with 8 treatments. The level measurement of Fatigue was used Fatigue Severity Scale (FSS) before (pretest) and after (posttest) intervention. The sample of this study was 15 respondents using purposive sampling technique. The result of the study based on the dependent sample t test, p value obtained 0,000 because of p value  $<$   $\alpha$  (0,05) it can be concluded that there is a significant effect between intradialytic exercise with the level of fatigue in hemodialysis patients in Dustira Hospital Cimahi 2019. The suggested of this results especially for hemodialysis nurses can do intradialytic exercise to overcome fatigue in CKD patients with hemodialysis.

**Index Terms:** Chronic Kidney Disease (CKD), Hemodialysis, Fatigue, Intradialytic Exercise.

## 1 INTRODUCTION

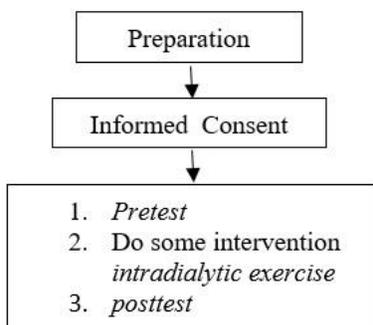
Chronic kidney disease (CGK) is a progressive and slowly of kidney disease (usually occurred on several years) and it's a health problem in every country with prevalence that always increased (Wilson, 2012). One of the main actions that can do on patients with CGK is routine to do hemodialysis therapy (Sulistiani, et al. 2012). The process of hemodialysis need times about  $\pm$ 5 hours generally will makes physical stress to patients after hemodialysis (Septiwi, 2013). Patient will feel headaches and perspiration cause blood pressure are come down with hemodialysis effect. A Bad nutrition status and low oxygen levels because anemia will make the body suffered extremely fatigued (fatigue) and will pushed heart to works harder to supply the oxygen needed (Black, 2005 in Septiwi, 2013) Fatigue can be defined as a subjective feeling that unpleasant like fatigue, weakness, and reduction energy. Fatigue is a general indication that happens on hemodialysis patients. The result of research showed that fatigue is one of the most general indication that can felt by the patients who enduring hemodialysis. Prevalence occurrence fatigue is between 60% until 97% (Septiwi, 2013). World Health Organization (WHO) said the number of patients with kidney disease in 2013 had increased by 50% from the previous years. In USA, the incidence and prevalence of kidney disease increased by 50% in 2014. The data showed that every year about 20.000 Americans people endured hemodialysis because of chronic kidney disease (Handayani Sri, 2018). The data from Indonesian Renal Registry 10th (Report of Indonesian Renal Registry) in 2018 showed a significant increase the numbers of hemodialysis patients since 2007 in the amount of 4,977 patients to be 30,851 patients in 2017. In West Java, there were recorded as 5,029 new patients with 3,358 active patients that enduring hemodialysis and it is the largest province that compared to another provinces in Indonesia (IRR source, 2014 in Handayani Sri, 2018). The first result of this survey at Dustira hospital Cimahi were recorded since 2014 until 2017 the patients who visited to hemodialysis unit was increased. While, in 2018 the patients who visited to hemodialysis unit was reduction. In 2015 there were recorded as many as 8,097 peoples, in 2016 there were recorded as many as 14,852 peoples, and in 2017 15,393 peoples was

recorded, and in 2018 15,305 peoples was recorded (Information System and Management of Hemodialysis Room at Dustira Hospital Cimahi, 2018). According to Septiwi (2013) dependence on hemodialysis machines is lifetime, changes of character, loss a job and loss income, are stressors that can make depression on hemodialysis patients with 15% -69% prevalence. This depression condition is able to affect the physical, so that can appear fatigue, sleep disturbance and reduction interest to do some activities. Reduction physical activity on hemodialysis patients can affect the levels of fatigue. Potential interventions who can do to reduced fatigue include conservation energy, activity management (intradialytic exercise) to improving sleep quality, muscle relaxation, massage and education (Mitchel, et al. 2007, in Sakitri, et al. 2017). Intradialytic exercise is defined as a planning movement, structured that able to improved or maintains one or more aspects of physical fitness and it's important to defending and improving health life on totality by using smooth muscle stretches and slowly movements (Orti, 2010 in Hartati, 2016). The problems formula in this research is "Is there any influence of intradialytic exercise to fatigue on hemodialysis patients at Dustira Hospital Cimahi?" the aims of this research is to know about the effect of intradialytic exercise to fatigue on hemodialysis patients at Dustira Hospital Cimahi.

## 2. METHOD

This type of research is using pre-experimental research design with one group pretest-posttest design, in this design there's no group (control). The total of population in this research is all of patients with chronic kidney disease who are scheduled routinely to enduring hemodialysis on one week two times in Hemodialysis Room at Dustira Hospital Cimahi. The sample technique has been used in this research is purposive sampling with total sample as many as 15 response who have selected according with inclusion and exclusion criteria. In the implementation of Intradialytic Exercise intervention have do on two hours first of hemodialysis as long as 15 minutes in 4 weeks, that is 8 times treatment (2 times / week). The research instrument that used in this research is fatigue assessment instrument Fatigue Saverity Scale (FSS) that was

according to the standard (Krupp, et al. 1989 in Asih, 2015) Data collected were analyzed using Dependent Simple T Test to find out is there any influence of intradialytic exercise to fatigue on hemodialysis patients at Dustira Hospital Cimahi. Here is the description flow of the research:



### 3 RESULT

#### 3.1 Univariate Analysis

**Table 1. The Distribution Frequency Levels of Fatigue Response Before Giving Intradialytic Exercise Therapy.**

Characteristic	Frequency	Presentation (%)
Fatigue	15	100%

Source: Primer Data, 2019/

**Table 2. The Distribution Frequency Levels of Fatigue Response After Giving Intradialytic Exercise Therapy.**

Characteristic	Frequency	Presentation (%)
Not Tired	9	60%
Fatigue	6	30%

Source: Primer Data, 2019

#### 3.2 Bivariate Analysis

**Table 3. The Result of Analysis Influence of Intradialytic Exercise on Fatigue in Hemodialysis Patients at Dustira Hospital Cimahi.**

Intervention	Mean	Std.Deviation	Std.Error Mean	P value	N
Pre-test	49,20	4,212	1,088	0,000	15
Post-test	39,47	8,400	2,169		

Source: Primer Data, 2019

### 4. DISCUSSION

Based on the results of statistical analysis shown in table 1, it can be known that the description of fatigue levels before do intradialytic exercise entirety is 15 respondents (100%) have fatigue criteria. This shows that fatigue (fatigue) who have experienced by patients with chronic kidney disease that reducing hemodialysis is a common symptom that often occurs. One of the causes become of fatigue on hemodialysis patients is anemia which is a condition when the body doesn't have red blood cells enough and erythrocytes conducted drops

oxygen supply and nutrition to whole of body. The results of this research are in line with research conducted by Marline et al. (2018) and Septiwi (2013) mentions that prevalence occurrence fatigue between 60% until 97% happen to patients who reducing hemodialysis like weak, weary, and listless. As for the factors that influence fatigue based on the results of interview the researcher have conducted that the majority of response suffering chronic fatigue, which is fatigue who continuing and physical fatigue who happen when people already to decrease his physical ability that used from usual. In addition, response didn't know how to overcome fatigue who suffering patients during hemodialysis. This condition shown that intradialytic exercise need to teach to the hemodialysis patients. Based on the result of statistical analysis listed on the table 2 it can be known that characteristic of response based on fatigue levels in hemodialysis patients after do intradialytic exercise majority as many as 9 response (60%) have not tired criteria and as many as 6 response (30%) have fatigue criteria. This result indicated although patients have done intradialytic exercise but it found that the patients still feel fatigue as many 6 response (30%). That condition happens because of damaged kidney function, one of kidney function is to manufacturing eritropoetin hormone have act on eritropoetin process or eritrosit founding. If the damaged kidney function happens then founding of red blood cells will obstructed and through decrease the number of eritrosit in bloods so it can make haemoglobin levels become low that cause anemia and makes fatigue on hemodialysis patients. This is consistent with the research who have done by Sulistiyani, et al. (2012) which states that there is a relationship between low haemoglobin levels with fatigue and also include the relationship between a long times enduring hemodialysis with fatigue levels. The results of this research by researcher are related with the research who have done by Sakitri et.al (2017) intradialytic exercise that have been given regularly can increase bloods flow to the muscle. Enlarge the number of capillaries and increase the area and surface capillaries. Intradialytic exercise also can show improvements in body fitness., physiologic function, dexterity to reduced fatigue levels, and to increase the power of lower muscles extremities. Intradialytic exercise had a role to maintaining and improving the overall of health by using smooth muscle stretches and slow movements. War Related illness injury Study Center (2012, in Sakitri, 2017) statements that intradialytic exercise (light exercise) performed on patients who suffer fatigue chronic regularly can reduced the fatigue, pain, stressed, and the other symptoms. During the research, there were that the response of response after getting intervention intradialytic exercise to be more relax, comfort, and some of response feel good effect from intradialytic exercise like not easy to get tired, and less stiffs. Based on that research, the researcher thought that fatigue levels who suffering by hemodialysis patients can reduced one of that influenced by giving intervention intradialytic exercise, when response feel more relax, comfort, not easy to get tired, and less stiffs. This accordance with research that have done by Parvan, et al. (2017) it claims that fatigue lessen after do intervention exercise when hemodialysis with statistic test result getting value  $p = 0,04$  ( $p < 0,05$ ), so it can be concluded that there is any effect of exercise during Hemodialysis to fatigue. Based on the bivariate analysis on table 3, the average score before do intradialytic exercise is 49,20 with Std.Deviation 4,212 and after do intradialytic exercise the

average score is 39,67 with Std.Deviation 8,295. The researcher calculating statistical using statistic parametric test result Dependent Sample T Test to determine the effect of intradialytic exercise to fatigue in hemodialysis patients. From the result of statistic test Dependent Samples T Test obtained p Value on fatigue score pre and post intradialytic exercise of  $0,000 < \alpha (0,05)$ . The result show there was an effect of decreased fatigue score on hemodialysis patients in Dustira Hospital Cimahi. In addition, this research was strengthened with result from research journal conducted by Sakitri et.al (2017) which showed that before give intervention intradialytic exercise was obtained the average result 7,93 and after do intervention intradialytic exercise obtained the average result 6,43. From the statistic test result, the value of  $p = 0,000 < \alpha (0,05)$  was obtained. It can be concluded that there is any effect of intradialytic exercise on fatigue. Fatigue appear as the effect of various factors including physiological factors (anemia, malnutrition, and uremia) that appears because the process of chronic kidney disease. This is compatible with research conducted by Sulistini, et al. (2012) which states that there is a relationship between low hemoglobin levels (anemia) and malnutrition conditions with fatigue occurrence. These conditions cannot be relieved with resting so it takes palliative measure such as physical exercise, activities suitable to ability and bloods transfusion (Petchrung, 2004 in Suliatiyani, et al. 2012). One type of physical exercise that can be performed on patients who enduring hemodialysis is intradialytic exercise which is a planned movement and structured to improve one or more aspects of physical fitness and important to maintain and improving the whole health by using smooth muscle stretches and slow safe movements who performed at 2 hours first of the hemodialysis process (Soliman, 2015; Marline, et al. 2018). Based on the result of analysis researcher show that intradialytic exercise is very useful to patients who enduring hemodialysis therapy routinely and can increase bloods flow to muscles, to increase the number of capillaries, enlarge area and surface the capillaries so that increase the movement of urea and toxin from the system to vascularity then transmitted to the dialyzer. Besides that, intradialytic exercise will stimulate the growth of capillaries bloods vessel in muscles who help body more efficiently on delivered oxygen to muscles, it can improve circulation as whole and take out the result of metabolic waste such as lactic acid from body inside. This is can show that any improvement into body fitness, physiological functions, and reduced fatigue levels and increase muscles strength in lower extremities (Sakitri, et al. 2017). The benefits of intradialytic exercise for patients who enduring hemodialysis therapy such as increased physical functioning, increased circulation on muscles, to facilitate the supply of nutrients to cells and enlarge the surface outer of capillaries that can maintains and improve health based as overall (Nur, et al. 2018). In this research intradialytic exercise is performed 8 times in 4 weeks, every treatment do in two hours first on hemodialysis process during 15 minutes. This is compatible with research conducted by Marline et al. (2018) which states that the implementation of intradialytic exercise as long as 4 weeks can reduce fatigue in patients who undergoing hemodialysis. As for the type of intradialytic exercise that used in this research is aerobic exercise (ROM exercise) which includes movement of wrists, elbow, and ankles. This is compatible with research conducted by Soliman (2015) which used aerobic exercise type in implementation of intradialytic exercise and in his research

there is an effect of intradialytic exercise on fatigue in patients who undergoing hemodialysis. Based on the description above, it can be concluded that the research conducted by researcher and supported by the results from various journals proved that it has differences fatigue levels before and after do intradialytic exercise intervention.

## 5. CONCLUSION AND SUGGESTION

### The conclusion on this research is:

1. the description of fatigue levels before doing intradialytic exercise shows that all of them are 15 response (100%) have fatigue criteria.
2. Pictures of fatigue levels after intradialytic exercise shows that most of the patients have not tired criteria as many as 9 response (60%) and almost half of them have fatigue criteria as many 6 response (30%).
3. There is an influence of intradialytic exercise to fatigue on hemodialysis patients at Dustira Hospital Cimahi with significance value less than  $\alpha 0.05$  (p value  $0,000 < \alpha 0.05$ ).

The results of this research are expected especially for hemodialysis nurses can able to perform intradialytic exercise to overcome fatigue in CGK patients with hemodialysis.

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