



## **THE RELATIONSHIP BETWEEN FATIGUE AND ACTIVITIES OF DAILY LIVING IN CHRONIC KIDNEY FAILURE PATIENTS UNDERGOING HEMODIALYSIS**

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### **ABSTRACT**

Patients with chronic kidney failure undergoing hemodialysis often experience decreased ability to perform activities of daily living. Fatigue is a common symptom that could influence the reduction of these activities. This study aims to analyze the relationship between fatigue and the level of independence of daily living activities in chronic kidney failure patients undergoing hemodialysis. This study used a descriptive correlative design and a cross-sectional approach with a population of 175 hemodialysis patients, which then obtained a sample of 121 people using the accidental random sampling technique. Data was collected using the FACIT Fatigue Scale and Katz index questionnaires, while the correlation test used Rank Spearman. The results showed a significant positive relationship between fatigue and the level of independence of daily living activities with a p-value = 0.001. The higher the fatigue value, the higher the level of dependence of a person on performing daily living activities. Early identification is needed to assess the fatigue status experienced by hemodialysis patients as a strategy to increase independence, which ultimately impacts quality of life.

Keywords: activities of daily living; chronic kidney failure; fatigue; hemodialysis

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## **INTRODUCTION**

Chronic kidney failure is still a global health problem with increasing prevalence and incidence, worsening prognosis, and relatively high treatment costs. Patients with chronic kidney failure need to receive fast and appropriate management so that their condition does not get worse. In the early stages, management of kidney failure is usually aimed at reducing or slowing down progressive kidney function disorders. However, if kidney failure has reached the end stage, management will focus on kidney function replacement therapy, one of which is hemodialysis therapy. Based on data from the International Society of Nephrology (ISN) in 2023, the incidence of chronic kidney failure globally reached 9.5% of the population, with 18.18% actively undergoing hemodialysis therapy. The prevalence of chronic kidney failure in Indonesia based on a doctor's diagnosis in the population aged  $\geq 15$  years, according to the 2023 Indonesian Health Survey data, reached 0.18% or 638,178 people with Central Java Province amounting to 0.19% or 88,180 people for the national prevalence. Meanwhile, data from the Indonesian Renal Registry (IRR) in 2020 showed that kidney failure patients actively undergoing hemodialysis therapy experienced several decreases compared to 2019, which amounted to 185,901 patients to 130,931 patients in 2020. Based on a preliminary survey conducted at Pandan Arang Hospital on February 28, 2024, as many as 175 patients had to undergo routine hemodialysis therapy twice a week during the December-January period.

Hemodialysis therapy is the primary treatment commonly performed on patients with chronic kidney failure. This therapy helps patients replace the function of damaged kidneys to filter blood. However, this therapy also has various impacts and side effects. One of the impacts of hemodialysis therapy is decreased physical capacity, which can result in reduced performance in daily life activities, working, recreation, and socializing, impacting the quality of life (Bachtiar & Purnamadyawati, 2021). In addition, hemodialysis therapy, which must be experienced for life, can also cause various complications, which, of course, can have a significant impact on the patient's physiological health (Saroni et al., 2023). Therefore, patients undergoing hemodialysis therapy tend to have lower physical and functional capacity compared to ordinary people. Not only that, hemodialysis therapy, carried out for an extended period, can also cause problems in the biological and psychological aspects of the patient (Anisah & Maliya, 2021). These things will certainly affect the patient's ability to carry out their daily activities. The results of the study by Amaliyah et al. (2019) showed that more than half (68.7%) of hemodialysis patients experienced severe Activity Daily Living (ADL) supply disorders, 20.2% experienced moderate functional disorders, and 11.1% did not experience functional disorders or all daily life activities could be done independently. The inability to carry out daily activities can make patients unable to care for themselves and depend on others, either wholly or partially. Disruption in fulfilling daily life activities in chronic kidney failure patients undergoing hemodialysis can be caused by many factors, one of which is fatigue.

Fatigue complaints are often reported in patients with chronic diseases, especially hemodialysis patients. The hemodialysis therapy process, which is carried out two to three times a week with each treatment usually lasting three to four hours, can undoubtedly cause patients to experience fatigue. The accumulation of metabolic waste in the body, an imbalance between fluids and electrolytes, abnormal energy expenditure, anemia, and depression can also cause fatigue in hemodialysis patients (Özberk & Kocamaz, 2020). In addition, physiological, demographic, socioeconomic, and situational factors also play an essential role in the onset of fatigue in hemodialysis patients. Research conducted by Musniati et al. (2020) showed that 79% of patients experienced fatigue, and 21% of patients did not experience fatigue.

Based on the results of the preliminary study that has been conducted, one of the hemodialysis nurses, through a brief interview, said that of the 175 chronic kidney failure patients undergoing hemodialysis at Pandan Arang Hospital, some of them experienced disturbances in their daily activities and some of them were still able to carry out their daily activities well. In addition, the nurse also revealed that quite a few patients often experienced fatigue both before and after hemodialysis. Therefore, this complaint of fatigue should not be ignored, considering the prevalence of patients experiencing fatigue is relatively high. Proper fatigue management is needed for chronic kidney failure patients undergoing hemodialysis so they do not experience significant fatigue and can carry out their daily activities optimally. This study aims to determine the relationship between fatigue and independence of daily living activities in chronic kidney failure patients undergoing hemodialysis at Pandan Arang Regional Hospital.

## **METHOD**

This study used a descriptive correlative design and a cross-sectional approach to determine the relationship between fatigue and the level of independence of daily living activities in chronic kidney failure patients undergoing hemodialysis. This study was conducted at the Hemodialysis Installation of Pandan Arang Hospital, Boyolali, in September-October 2024,

with a population of 175 patients. From this population, several samples were taken using the Accidental Random Sampling technique with specific inclusion and exclusion criteria so that 121 respondents were obtained. The inclusion criteria for this study were hemodialysis patients undergoing outpatient care, at least 17 years old, willing to as respondents, and able to communicate well. The exclusion criteria were patients who experienced limb disorders, were pregnant, were unwilling to be respondents, were unable to communicate well, and had cognitive disorders. Data collection was carried out by filling out a questionnaire consisting of patient demographic data, the FACIT Fatigue scale used to measure fatigue, and the Katz Index used to measure the level of independence of daily living activities. A bivariate analysis test was conducted using the Spearman Rank test with a significance limit (Alpha) = 0.05 to determine the correlation of the two variables. This study has also received ethical clearance from the Health Research Ethics Committee, Faculty of Health Sciences, Muhammadiyah University of Surakarta, with letter number No. 540/KEPK-FIK/IX/2024.

## RESULT

Table 1.  
Frequency Distribution of Patient Characteristics (n=121)

Characteristics	f	%
Age		
20-40 years	17	14,0
41-59 years	57	47,1
60-84 years	47	38,8
Gender		
Male	63	52,1
Female	58	47,9
Education		
Elementary School	37	30,6
Junior High School	24	19,8
Senior high School	44	36,4
Bachelor	16	13,2
Pekerjaan		
PNS	2	1,7
TNI/POLRI	1	0,8
Self-employed	24	19,8
Privat employed	9	7,4
Others	85	70,2
Marital Status		
Married	110	90,9
Unmarried	11	9,1
Long Time Undergoing Hemodialysis		
<1 year	46	38,0
>1 years	75	62,0

Based on the table above, of the 121 chronic kidney failure patients undergoing hemodialysis, almost half of them were aged 41-59 years, which was 57 people (47.1%). Based on gender, the percentage of male and female patients was almost balanced, with only five more male patients. Based on education, more than a third of the patients had a senior high school education (36.4%), more than a third had an elementary school education (30.6%), and the rest had a junior high school education (19.8%) and a bachelor's degree (13.2%). Based on occupation, 85 patients (70.2%) worked other jobs, including homemakers, drivers, farmers, retirees, and students. Based on marital status, 90% of patients had a married status. Based on the length of hemodialysis, 46 patients (38%) had undergone hemodialysis for less than one year, and 75 patients (62%) had undergone hemodialysis for more than one year.

Table 2.  
Distribution of Fatigue Levels Experienced by Patients (n=121)

Fatigue	f	%
Mild	46	38,0
Moderate	58	47,9
Severe	17	14,0

Table 2 shows that almost half of the respondents, or 58 patients (47.9%), experienced moderate fatigue, 46 patients (38%) experienced mild fatigue, and the remaining 17 patients (14%) experienced severe fatigue.

Table 3.  
Distribution of Level of Independence of Daily Living Activity of Patients (n=121)

Activities of Daily Living	f	%
Independent	75	62,0
Partially Dependent	25	20,7
Totally Dependent	21	17,4

Table 3 shows that most patients (62%) have daily activities at the independent level. A total of 25 patients (20.7%) have independence in daily living activities at the partially dependent level. The remaining 21 patients (17.4%) have totally dependent daily living activities.

Table 4.  
Relationship between Fatigue and Activities of Daily Living (n=121)

Relationship between Fatigue and Activities of Daily Living (n=121)									
Fatigue	Activity Daily Living						Total		P Value
	Totally Dependent		Partially Dependent		Independent				
	f	%	f	%	f	%	f	%	
Severe	14	82,4	2	11,8	1	5,9	17	100	0,001
Moderate	5	8,6	21	36,2	32	55,2	58	100	
Mild	2	4,3	2	4,3	42	91,3	46	100	

Table 4 shows that patients with very dependent daily living activities with severe fatigue have a higher percentage (82.4%) than patients with moderate (8.6%) and mild (4.3%) fatigue. Patients with partially dependent daily living activities with moderate fatigue have the highest percentage (36.3%) than severe (11.8%) and mild (4.3%) fatigue. Meanwhile, patients with daily living activities at the fully independent level with mild fatigue have the highest percentage (91.3%) among the three fatigue levels. After conducting a correlation test between the two variables using the Spearman rank test, a P-value of 0.001 (<0.05) was obtained. This indicates that H0 is rejected and Ha is accepted. A significant positive relationship exists between fatigue and the level of independence of daily living activities.

## DISCUSSION

Based on research on patient characteristics, it was found that most patients were in the age range of 41-59 years. These results are supported by research by Hasanah et al. (2023), which categorizes age into six groups, showing that as many as 35% of hemodialysis patients are in the age range of 46-55 years. Another study by Arianti, A., Rachmawati, A., & Marfianti, E. (2020) also showed that 61.4% of CKD patients were 45-65. This means that most hemodialysis patients are in the middle-aged age group. As age increases, a person will be at greater risk of developing chronic diseases, considering the course of the disease, which requires a relatively long period. In addition, increasing age can also cause body cells to weaken, as well as the kidneys; the number of nephrons that function properly will also decrease, so chronic kidney failure is more common in adults or older people than at other age levels (Smeltzer, 2017).

Based on gender, the percentage of chronic kidney failure is higher in men than women, although the difference is not significant. This is also consistent with the findings of Sri Purwanti et al. (2024), who stated that there was no significant difference between the number of men and women in the study conducted. Basic Health Research (Riskesdas) data in 2018 also showed that the prevalence of kidney disease in men reached 4.17%, while in women, it was 3.52%. Men are more likely to get kidney disease caused by internal and external factors. Internal factors include hormonal differences, heredity, or hereditary factors. External factors can be an unhealthy lifestyle and environment, such as smoking, consuming alcohol, coffee, or supplements, which can increase the work of the kidneys in filtering blood.

Based on education level, most patients had a high school and elementary school education, followed by junior high school, and the least were undergraduates. This is in line with research conducted by Pande Made Desy et al. (2022), which showed that most hemodialysis patients had a final education level of senior high school. This level of education will undoubtedly affect a person's efforts to maintain and care for their health. A person with a higher level of education will certainly have broader knowledge, thus allowing better self-control in dealing with a problem, quickly understanding advice from health workers, and being able to reduce anxiety effectively can help individuals make the right decisions regarding health and medical care that must be undergone to prevent the development of the disease (Devi & Rahman, 2022).

Based on the study's results, 70.2% of patients stated they worked other jobs, such as drivers, farmers, retirees, homemakers, and students. Some indicated they did not work because of their inability or physical limitations. This is related to decreased kidney function, which can impact limited physical function in carrying out activities (Daskapan et al., 2018). Based on marital status, more than 90% of patients are married, and the rest are unmarried. Other studies also show that more than sixty percent of hemodialysis patients are married (Melati et al., 2022). This marital status is related to the family support that patients will receive in dealing with their chronic illness. Tadesse et al. (2021) stated that support, attention, and affection from the family are significant for patients because they can reduce stress and anxiety that can interfere with the patient's psychology due to their illness. An atmosphere of mutual trust, respect, and mutual support that creates closeness between couples and families will provide positive interactions so that the quality of health of patients undergoing hemodialysis can improve.

The study results show that over half of the patients have undergone hemodialysis for over a year. The results of this study are similar to those of a study conducted by Permata Sari et al. (2022), which showed that more than fifty percent of hemodialysis patients had undergone hemodialysis for more than one year. The time a person undergoes hemodialysis can affect their quality of life. The initial response of patients when they have to undergo hemodialysis is usually that they do not accept the loss of kidney function, are angry about the incident, and feel sad about the incident they experienced. Therefore, they need a relatively long adjustment period to their new condition and must undergo hemodialysis twice a week (Zurmeli et al., 2018). based on the study results that have been carried out, patients expressed that the longer they undergo hemodialysis, the more they will be able to adapt and accept the kidney disease they are currently experiencing. However, it should be remembered that each person needs a different amount of time to adjust to their illness.

Research that has been conducted on the level of fatigue found that almost half of hemodialysis patients experience moderate fatigue. This study's results align with the research

of Rani et al. (2022) that more than one-third of patients undergoing hemodialysis experienced moderate fatigue. Fatigue experienced by hemodialysis patients tends to be felt at moderate to severe levels (Sajidah et al., 2021). Fatigue experienced by these patients can be caused by several factors, such as demographic factors, including age, gender, education, occupation, and support status (Sulistini et al., 2018). Hemodialysis therapy, which lasts approximately 4.5 hours with a frequency of twice a week, can also cause fatigue in hemodialysis patients. In addition, anaemia and decreasing haemoglobin levels can also cause patient fatigue. Patients who experience fatigue tend to experience physical and psychological changes (Musniati & Kusumawardani, 2019). This is undoubtedly by the results of the research that has been conducted where hemodialysis patients who were respondents said that they often felt symptoms of fatigue such as tired, weak, lethargic, exhausted, and powerless, which in the end could make them unable to complete their routine activities so that they feel disappointed and sad.

Based on the results of the study on daily living activities, it was found that more than half of the patients had daily living activities at an independent level. The results of this study align with research conducted by Mollaoğlu (2021) with the same measuring instrument; it was found that 65.1% of hemodialysis patients maintained their daily living activities independently. Another study by Bachtiar and Purnamadyawati (2021) also showed that 78.6% of patients undergoing hemodialysis had daily living activities in the fully independent category. Based on the results of the study that was conducted, patients who were included in the fully independent category stated that they could carry out all their daily activities, from bathing, dressing, going to the toilet, moving, sleeping, and generally eating without requiring help from others patients who were partially or partially dependent experienced deficits in one to three of the six functions. Meanwhile, entirely dependent patients could not perform five or all of the functions measured in the study.

Based on the results of the bivariate test, a P-value of 0.001 ( $<0.05$ ) was obtained. There is a significant positive relationship between the level of fatigue measured using the FACIT Fatigue Scale and ADL independence measured using the Katz Index. This means that the higher the score on the FACIT Fatigue Scale, which indicates a lower level of fatigue, the higher the Katz Index score, which indicates better independence in performing daily life activities. In other words, patients who experience higher fatigue tend to have a higher level of dependence in performing basic daily activities such as eating, bathing, dressing, and mobility. The results of this study are almost similar to the results of the survey by Bahgat et al. (2016), with different measuring instruments showing a significant negative correlation between the level of fatigue and the level of daily life activities, which means that when fatigue increases, daily life activities will decrease. When fatigue decreases, daily life activities will increase. So, fatigue affects the daily activities of adults undergoing hemodialysis. Other studies also state that fatigue in hemodialysis clients can cause decreased concentration, weakness, sleep disturbances, emotional disturbances, and decreased daily activities (Nathasia et al., 2020). However, this is in contrast to the results of a study conducted by Figueiredo et al. (2022), which stated that kidney failure patients undergoing hemodialysis did experience fatigue. Still, the fatigue experienced was not related to the level of dependence on basic and instrumental activities of daily life.

Fatigue can be one of several factors that can affect independence in the daily activities of chronic kidney failure patients undergoing hemodialysis. Excessive and continuous fatigue can make a person unable to carry out daily activities independently, causing dependence on others and decreasing quality of life. However, it should be noted that based on the results of

this study, fatigue impacts the disruption of daily life activities by 39.3%. This means that 60.7% of other factors can still affect hemodialysis patients' daily life activities, such as age, stress, physiological and psychological conditions, etc. Therefore, healthcare providers should be able to understand the factors that cause fatigue along with the signs and symptoms that often appear as early as possible so that they can provide fast and appropriate interventions according to patient needs to reduce fatigue. If fatigue can be reduced, the patient's daily activities will also increase to optimal.

## **CONCLUSION**

The study's results on patient characteristics show that patients undergoing hemodialysis are mainly in the age range of 41-59 years, male, have a high school education and other work, are married, and have undergone hemodialysis for more than one year. Meanwhile, the relationship test results show a significant positive relationship between fatigue and independence in daily activities in chronic kidney failure patients undergoing hemodialysis. The higher the fatigue value experienced by the patient, the higher the level of patient dependence on daily life activities. In other words, the lower the fatigue value, the higher the level of patient independence. Early identification is needed to assess the state of fatigue experienced by patients as an effective and efficient strategy to increase independence, which can ultimately impact quality of life. The results of this study can be used as a basis for nurses to conduct further studies on the problem of fatigue and daily activities by taking a holistic approach to patients from a biopsychosocial perspective. For further research, an analysis of other factors that can affect the daily life activities of chronic kidney disease patients undergoing hemodialysis can be carried out.

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