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Stressful Conditions Increase Fatigue during Undergoing Hemodialysis

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ABSTRACT
Hemodialysis is a therapy given to replace kidney function. This therapy has various physical and psychological impacts on the sufferers. This study aims to analyze stress conditions with fatigue in patients undergoing hemodialysis. Analytic observation research design with a cross-sectional approach. Population of chronic renal failure patients undergoing hemodialysis. The sample was 54 patients, with a non-random sampling technique, with inclusion criteria, namely routine hemodialysis 2 times/week, full consciousness, communication well, and not experiencing complications during dialysis. Analysis using the Independent T-test and Pearson Correlation Test. The instruments used were the Depression Anxiety Stress Scale questionnaire and the fatigue questionnaire. The analysis results obtained the youngest age (17 people), more women than men, most of them have higher education and most of them undergo hemodialysis for more than 11 months. The average patient undergoing hemodialysis experienced mild stress and was in a state of severe fatigue. There was a significant relationship between stress and fatigue (p-value 0.048), with a prediction model that increasing one stress score will increase the fatigue score by 0.237. Therefore, psychological aspects must be an important concern in providing nursing care to patients undergoing hemodialysis in the hemodialysis unit.
***Keywords**: Fatigue; Psychological ; Stress*

ABSTRAK
Hemodialisa merupakan terapi yang diberikan sebagai penganti fungsi ginjal. Terapi ini memberikan berbagai dampak fisik dan psikologis pada penderitanya. Penelitian ini bertujuan menganalisis kondisi stres dengan *fatigue* pada penderita yang menjalani hemodialisis. Desain penelitian *observasi analitik* dengan pendekatan cross sectional. Populasi penderita gagal ginjal kronik yang menjalani hemodialisis. Sampel berjumlah 54 pasien, dengan teknik non random sampling, dengan kriteria inklusi yaitu rutin hemodialisis 2 kali/ minggu, kesadaran penuh, dapat berkomunikasi dengan baik, tidak mengalami komplikasi saat dialisis. Analisis menggunakan uji T Independen dan Uji Korelasi Pearson. Instrumen yang digunakan kuesioner

Depression Anxiety Stress Scale, kuesioner *fatigue.* Hasil analisis didapatkan usia termuda (17 orang), perempuan lebih banyak dibandingkan laki-laki, sebagian besar berpendidikan tinggi dan sebagian besar menjalani hemodalisis lebih dari 11 bulan. Rata rata penderita yang menjalani hemodialisis mengalami stres ringan dan berada pada kondisi fatigue berat. Ada hubungan yang signifikan antara stres dan *fatigue* (p value 0,048), dengan model prediksi peningkatan satu skor stres akan meningkatkan skor fatigue sebesar 0,237. Oleh karena itu aspek psikologis perlu menjadi perhatian penting dalam memberikan Asuhan keperawatan pada Pasien yang menjalani Hemodialisis di unit Hemodialisis.
Kata Kunci : *Fatigue*; Psikologi; Stress

INTRODUCTION

Progressive kidney damage that occurs in patients with chronic kidney disease, can result in death because the body is unable to maintain metabolism and fluid and electrolyte balance, causing azotemia (Diyono and Mulyanti, 2019). Patients with chronic kidney failure (CKD) who received hemodialysis therapy in 2020 in Indonesia amounted to 130,931, while in South Sumatra, there were 715 people in 2017. To serve hemodialysis in Indonesia, there are up to 475 dialysis machines with 338 nurses (Perhimpunan Nefrologi Indonesia, 2020).

Hemodialysis is one of the kidney replacement therapies for patients with chronic kidney damage. Dialysis is a treatment that is carried out for a long time as a temporary treatment before undergoing kidney transplantation (*Indonesian Nephrology Association,* 2023). Hemodialysis has various effects on patients with CKD who undergo it, and usually, up to 80% of patients undergoing hemodialysis experience fatigue (Artom *et al.*, 2014; Picariello *et al.*, 2017; Bossola *et al.*, 2023)

Fatigue is weakness and decreased energy that is felt subjectively and unpleasant. This condition will eventually affect the quality of life of patients with CKD, therefore appropriate interventions are needed to overcome fatigue in sufferers. Patients undergoing hemodialysis are also vulnerable to various psychological problems including depression, anxiety, and stress. (Bezerra, Silva and Elias, 2018; Ghaffari *et al.*, 2019)

Stress in patients with hemodialysis can be caused by changes in life because patients must depend on dialysis machines, undergo routine dialysis processes, changes in health status, and face unstable economic conditions. These changes are stressors for kidney failure patients undergoing dialysis (Gerogianni and Babatsikou, 2014; Canaud *et al.*, 2021). The condition of chronic renal failure itself has a wide range of effects including dialysis therapy, complications in the heart, blood vessels, reproduction, skin, anemia, and musculoskeletal, and almost the entire system has changed. This condition has also given me a feeling of anxiety and

stress in dealing with the reality of chronic renal failure (Bezerra, Silva and Elias, 2018)

The role of nurses is crucial in managing and overcoming the problems caused by hemodialysis therapy by paying attention to all aspects of physical, psychological, social, and cultural factors (Loenggogeni, 2023; Suriani, Neherta, and Sari, 2023). Therefore, in this study, we examine the extent of the relationship between the two stress variables and fatigue.

METHOD

The design used was analytic observational with a cross-sectional approach. Data collection was carried out in the hemodialysis room of a hospital in Palembang City on 54 respondents. Sampling was done using non-random sampling, with inclusion criteria, being patients with CKD who have undergone hemodialysis at least twice (1 week), with dialysis frequency of twice a week, full consciousness, ability to communicate well, and signed informed consent. Exclusion criteria included complications during hemodialysis and hearing loss. Data collection was done using interview techniques. The research instrument used the FACIT- Fatigue Scale to measure fatigue scores, with high validity (Cronbach alpha 0.96) and reliability (ICC 0.95) (Tennant, 2019) and the Indonesian version of the Depression Anxiety Stress Scale (DASS 42), with satisfactory reliability (0.806-0.917) for the measurement of stress scores (Muttaqin and Ripa, 2021). The data in this study were analyzed using the Independent T-test and the Pearson Correlation test.

RESULTS AND DISCUSSION

The results of the analysis are presented in the form of descriptions of age, gender, education, length of hemodialysis, stress, and fatigue. Table 1 shows that 68.5% of patients are aged 45 or older, and 53.7% are women. More respondents had high school or college education (64.5%), and most undergone dialysis for more than 11 years.

Table. 1. Characteristics of Patients Undergoing Hemodialysis (N=54)

Variable	f	%
Age		
Young (<45 yrs)	17	31.5
Old (>45 yrs)	37	68.5
Gender		
Male	25	46.3
Female	29	53.7
Education		
Low (elementary school &	19	35.2
junior high school)	35	64.8

Variable	f	%
High (High School & College)		
Duration of Hemodialysis		
Not long (<11 months)	21	38.9
Long(>11 months)	33	61.1

Patients who underwent hemodialysis were predominantly aged 45 years or older (68.5%) and female (53.7%). Of the patients who underwent hemodialysis, 64.8% had a high level of education, namely high school or college. Most patients have been undergoing hemodialysis for a long time (61.1%), which is 11 months or more.

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Table. 2. Average Stress and Fatigue scores of Patients undergoing Hemodialysis (N=54)

Variable	Mean	Median	SD	Min - Max	95% CI
Stress	12.96	14	6.23	0 - 27	11.26 – 14.67
Fatigue	21.31	21.5	5.47	9 - 34	19.82 – 22.81

Table 2 explains that the average stress score is 12.96, indicating that the average patient undergoing hemodialysis is at a mild stress level. However, the variation in stress levels among patients undergoing hemodialysis ranges from a stress score of zero to a severe stress score of 27. Table 2 also describes that patients have average fatigue of 21.31, indicating that the average patient experiences severe fatigue (Score < 30). Fatigue levels among patients undergoing hemodialysis vary from a score 9 to a high of 34.

Table 3. Correlation between Stress and Fatigue (N 54)

Variable	r	R2	Line equation	P *Value*
Stress	0.270	0.073	Fatigue=18.243+0.237*Stress	0.048

Table 3. illustrates that only 7.3% of the fatigue variable can be explained by the stress variable. This means that this model has a weak predictive ability, and to improve it, additional variables and/or a more complex analysis approach are required. The line equation model obtained in Table 3 can be used to predict the level of fatigue, namely every increase of 1 stress score will increase the fatigue score 0.237. Hemodialysis is a kidney replacement therapy used for acute patients and patients

with terminal-stage kidney disease, ot those who have reached stage V (Nurchayati, 2011). This condition has many physical and psychological impacts including stress. From the results in Table 3, it is found that there is a significant relationship between stress and fatigue (p=0.048). This relationship is weak (r=0.270) and positive, meaning that an increase in stress scores will increase fatigue scores.

Fatigue describes the subjective feelings that individuals have, and this is influenced by other factors, one of which is psychological factors including depression, anxiety, and stress (Prastiwi, Wihastuti and Ismail, 2021) dan stress (Picariello *et al.*, 2017).

Stress conditions are associated with fatigue in patients with CKD who undergo hemodialysis (García-Llana *et al.*, 2014; Picariello *et al.*, 2017; Sulistni, Damanik and Lukman, 2021). Stress can affect fatigue through various physiological mechanisms. The hormone cortisol increases under stressful conditions, causing changes in blood circulation, heart rate, and blood pressure. This condition drains the body's energy resulting in fatigue. (Harrington, 2013). Stress in patients undergoing hemodialysis is usually due to daily restrictions, tension from dependence on hemodialysis machines, loss of self-esteem, uncertainty about the future, and feelings of guilt towards the family. (Kang and Chae, 2021). Another parallel study by Sari (2019) states that patients undergoing dialysis can experience severe stress, reaching 25%, and shows a relationship between fatigue and stress in patients undergoing hemodialysis therapy. (Kocalevent *et al.*, 2011).

Therefore, researcher assumes that as the stress score increases in patients undergoing hemodialysis, the fatigue score also increases. Patients who experience stress during hemodialysis therapy cause fatigue, even though the results of the analysis (r = 0.270) show that the relationship between the two variables is weak. However, there is an opinion that stress and fatigue form a mutually reinforcing cycle. Stress causes a person to experience fatigue, which leads to a decrease in work productivity, further increasing stress. Comprehensive physical and psychological care is needed in treating patients undergoing hemodialysis. In the Hemodialysis Unit, nurses performing nursing care can add educational interventions and provide psychological support (Parvan *et al.*, 2015), and develop stress management and relaxation techniques (Sultan *et al.*, 2023).

CONCLUSION

There is a significant relationship between stress and fatigue in patients undergoing hemodialysis in the hemodialysis unit (p 0.048). An increase of one stress score can increase the fatigue score by 0.237. Therefore, the psychological aspects of patients undergoing hemodialysis need special attention from families, nurses, and other health workers in the Hemodialysis Unit.

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