



ASSOCIATION BETWEEN FAMILY SUPPORT AND THE SEVERITY OF FATIGUE IN PATIENTS UNDERGOING REGULAR HEMODIALYSIS

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ABSTRACT

Introduction: Numerous studies indicate that fatigue is among the most frequently reported side effects in hemodialysis, and if left unaddressed it can negatively affect their quality of life. Conversely, family support may significantly enhance the quality of life for hemodialysis patients. This study explore the association between family support and fatigue in patients undergoing regular hemodialysis. **Methods:** This study used a cross-sectional survey design involving patients who regularly received hemodialysis at Haji Adam Malik Hospital. Participants were selected through consecutive sampling. Fatigue levels were assessed using the Functional Assessment of Chronic Illness Therapy-Fatigue (FACIT-F) Questionnaire, which was translated into Bahasa. Family support was assessed using the Family Support Questionnaire developed by Rosyidah. The data collected from the sampling were analyzed using SPSS version 27. **Results:** Among the 100 hemodialysis patients, 62% reported receiving good family support, 26% reported receiving enough family support, and 12% reported receiving low family support. A survey indicated that 48% of respondents felt mild fatigue, while 36% reported moderate fatigue, and 16% felt severe fatigue. Spearman Ranks test showed a significant association between family support and fatigue ($r=0,378$; $p<0,01$). **Conclusion:** Family support is significantly associated with fatigue in regular hemodialysis patients.

Keywords:

*Fatigue,
Family Support,
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INTRODUCTION

Hemodialysis is a commonly performed renal replacement therapy, with approximately 69 percent of the 3.9 million patients with kidney failure choosing the treatment.¹ According to the Indonesia Renal Registry (IRR), the prevalence of patients undergoing hemodialysis has shown a consistent annual increase, as well as those starting hemodialysis in Indonesia. The highest amount of patients based on the main diagnosis in 2020 was CKD Stage 5 with a total of 61,786 cases.² In 2018, the number of new hemodialysis patients in North Sumatra increased significantly, rising from 2,690 cases in 2017 to 4,076 cases in 2018, indicating a marked upward trend within a one-year period.³

Patients undergoing hemodialysis experience several symptoms that create limitations on their daily physical and mental activities, along with social interactions, which can have a negative impact on their psychological well-being. A common symptom experienced by hemodialysis patients is fatigue.⁴ Fatigue is a complex, multidimensional, subjective experience that characterized by feelings of tiredness, exhaustion, weakness, or lack of energy.⁵ Energy is frequently spent before treatment even starts due to the physical distress of getting to and from dialysis facilities. Although dialysis is essential for adequate filtration, each session can be psychologically and physically taxing if the duration exceeds the patients' capacity. Consequently, if dialysis sessions are arranged at incorrect times that disrupt daily routines



or nocturnal rest, this adversely impacts circadian rhythms and induces excessive fatigue.⁶

A research of 194 participants showed that about 83.5% have this condition. L-carnitine deficiency in hemodialysis patients due to decreased productions in kidney, loss of dialysis, and decreased dietary intake exacerbated fatigue.⁷ Another factors contribute to fatigue including increased inflammatory circulating markers, metabolic acidosis, malnutrition, anemia, impaired oxygen delivery, malnutrition, immobilization, obstructive sleep apnea⁸, poor sleep quality, restless leg syndrome⁹, anxiety, depression¹⁰. In addition, increased dependence, changing roles in the family, decrease social activities, limitations due to hemodialysis (future plans and diet), changes in body image, and threat of death can lead to fatigue.¹¹ Inflammation is a key factor in driving numerous metabolic alterations in hemodialysis patients. It contributes to fatigue through the interaction between the central nervous system and proinflammatory cytokines and, that also promoting peripheral tissue changes and anorexia, characterized by increased catabolism of muscle and adipose tissue.⁸

A study showed a significant negative association between fatigue and quality of life, caused by energy loss, decreased cognitive and motor functioning, and lowered personal dignity. The presence of these factors may impacted to a the patient's mental and physical health, restrict routine activity, alterations in social interactions, and a reduction in the overall quality of life for individuals receiving hemodialysis treatments.^{10,12}

Conversely, support from family members is crucial for improving hemodialysis patients' quality of life through giving an essential emotional and assisting in managing the various challenges posed by their condition throughout the treatment process. Family support manifests in several forms, including appraisal support, which offers validation and encouragement; instrumental or financial support, which provides tangible resources and assistance; informational support, which supplies crucial knowledge and guidance about managing health; and emotional support, which fosters a sense of belonging and understanding during difficult times.^{13,14} A Research conducted using an experimental design with pre-test and post-test has demonstrated that the quality of life for hemodialysis patients significantly improves following family support interventions

compared to their condition before the family support was given.¹⁵ Family support among patients undergoing hemodialysis has been extensively investigated in Indonesia. However, there have been limited studies that have specifically examined its association with fatigue incidence or severity in Indonesia. Considering this background, the researchers aim to explore the association between family support and hemodialysis patients' fatigue.

METHODS

The research used an analytical observational technique using a cross-sectional design, data were collected between July and November 2024 at Haji Adam Malik Hospital in Medan. Participants had to meet the inclusion criteria of receiving regular hemodialysis for a minimum of one month, providing consent to participate, completing all questionnaire items, and at least 18 years old. Patients were excluded if they had not undergone hemodialysis at least eight times in the previous month and were not conscious during data collection. The sample size for this study was determined using the Lemeshow formula, requiring a minimum 97 patients undergoing regular hemodialysis. After the data collection and application of inclusion and exclusion criteria, a final sample size of 100 participants was achieved.

The study variables included patients' age, gender, marital status, comorbidity, fatigue severity, and family support of the patients through interviews the hemodialysis patients. Fatigue severity was measured by using the Functional Assessment of Chronic Illness Therapy-Fatigue (FACIT-F) Questionnaire, which has been translated into Indonesian and has a reliability score of 0.646. Fatigue is classified into three levels: severe fatigue with a score below 17, moderate fatigue with a score ranging from 17 to 30, and mild fatigue with a score above 30.¹⁶ Family Support was measured by Family Support Questionnaire, developed by Rosyidah, with a reliability score of 0.935. Family support is categorized into three levels: low family support (20-40), adequate family support (41-60), and good family support (61-80).¹⁷

Data collected were analyzed using SPSS software version 27. Spearman's Rank correlation test was used as in this study. A significance level (p) of 0.05 was selected for this study.



RESULTS

Characteristics of Regular Hemodialysis Patients

Table 1 shows that the majority of regular hemodialysis patients at Adam Malik Hospital in Medan is 45-59 years (43%). The gender distribution indicated a slightly higher proportion of males (57%). Most respondents were married (86%). The most common comorbidities among patients were hypertension (52%) and diabetes (20%).

Table 1. Characteristics of regular hemodialysis patients

Characteristic	n=100	%
Age		
19-44 years	33	33
45-59 years	43	43
≥ 60 years	24	24
Gender		
Male	57	57
Female	43	43
Married		
Yes	86	86
No	14	14
Comorbidity		
Have comorbidity	90	90
Hypertension	52	52
Diabetes	20	20
Gout	11	11
Coronary Heart Diseases	7	7
No Comorbidity	10	10

Source: Research data, processed

Distribution of Respondents based on Level of Fatigue and Family Support

Based on Table 2, the majority of regular hemodialysis patients experienced mild fatigue (48%). Most of respondents receiving good family support (62%).

Table 2. Prevalence level of fatigue and family support in regular hemodialysis patients

Variabel	n	%
Fatigue		
Severe	16	16
Moderate	36	36
Mild	48	48
Family Support		
Low Family Support	12	12
Enough Family Support	26	26
Good Family Support	62	62

Source: Research data, processed

Association between severity of fatigue and family support

Based on table 3, after Spearman Ranks' analysis shows a p-value of <0,001, which indicates a significant association between the severity of fatigue and family support (p<0,05).

Table 3. Spearman Ranks' analysis the severity of fatigue and family support

Family Support	Fatigue						p-value	r2
	Severe		Moderate		Mild			
	n	%	n	%	n	%		
Low Family Support	8	8	2	2	2	2		
Adequate Family Support	5	5	11	11	10	10	<0,001	0,378
Good Family Support	3	3	23	23	36	36		

*statistically significant (p<0,05)

DISCUSSION

Description of Respondent Based on Characteristics

Based on the demographic data of patients in this study, 43% of regular hemodialysis patients at Haji Adam Malik Hospital in Medan are aged around 40-59 years. This finding aligns with research by Pasaribu R., which found that the majority of hemodialysis patients at Rumah Sakit Khusus Ginjal Raysida Medan were within the 40-60 age range, comprising 51.4% of the patient population.¹⁸ As age increases, especially after 40, natural aging occurs in various organs. This aging process occurs gradually, with a progressive decline in kidney function and structural changes. During this process, the number of nephrons decreases to a level still acceptable by the body, reflected in a reduction in glomerular filtration rate (GFR) that aligns with age.¹⁹ The predominance of patients aged 40–59 years suggests that middle-aged adults undergoing hemodialysis may experience substantial physical and psychosocial burdens, including persistent fatigue that can interfere with work and family responsibilities.²⁰

The most prevalent gender among regular hemodialysis patients is male (57%). This result is consistent with Prasetyo's research, which found that 52% of hemodialysis patients were male.²¹ Behavioral and lifestyle factors such as higher prevalence of smoking, occupational exposures, and cardiovascular risk profiles in men may accelerate CKD



progression.²² Gender differences may influence how fatigue is perceived, reported, and managed among hemodialysis patients, as men are often less likely to express emotional distress or actively seek psychosocial support, potentially resulting in under-recognized fatigue and suboptimal coping. In contrast, strong family support has been associated with reduced fatigue severity and better psychological adjustment, particularly when family involvement promotes treatment adherence and symptom monitoring.²⁰

The majority (86%) of regular hemodialysis patients are married. This aligns with Sharif-Nia study¹², which found that 90.8% of regular hemodialysis patients were married. Marriage, as the foundation of a family, plays an important role for hemodialysis patients. Patients with chronic kidney disease are highly reliant on continuous hemodialysis treatment, making family or spousal support essential in helping them achieve better health.²³ Marital status alone does not guarantee effective or positive support; the quality and functionality of the relationship are more predictive of health outcomes than marital status per se. Furthermore, confounding factors such as socioeconomic status, health literacy, and cultural norms may influence both marriage rates and health behaviors. Therefore, while family or spousal support appears to play a meaningful role in helping hemodialysis patients achieve better health outcomes, future research should distinguish between structural marital status and functional social support to clarify causal pathways and strengthen the evidence base.²⁴

Approximately 90% of regular hemodialysis patients have comorbidities. This aligns with study by Suparti and Nurjanah²⁵, which revealed that 85,9% of regular hemodialysis patients had comorbidities. Common comorbidities among hemodialysis patients include diabetes, hypertension, gout, heart failure, cancer, and liver disease. These comorbidities are pathophysiologically interconnected with CKD progression, as chronic hyperglycemia, sustained intraglomerular pressure, impaired renal perfusion, and systemic inflammation collectively accelerate renal structural damage and functional decline. Additionally, the number of comorbidities an individual has also affected the chronic kidney disease progression and accelerates the initiation of dialysis.^{26,27} Fatigue in hemodialysis patients has been shown to be more severe and persistent in the

presence of multiple comorbidities, likely due to overlapping pathophysiological mechanisms such as chronic inflammation, metabolic dysregulation, and reduced physical reserve.²⁰

Description of Respondent Based on Fatigue Severity

After conducting a search and analysis using the Functional Assessment of Chronic Illness Therapy-Fatigue (FACIT-F) questionnaire, this study found the majority of hemodialysis patients experience mild fatigue (48%). This aligns with findings of Hasballah et al.²⁸ obtained that from 59 patients there was 27 people (45,8%) have mild fatigue.

The feeling of weakness, decreased energy, difficulty concentrating, and impaired cognitive function are all signs of fatigue in hemodialysis patients. The Pathogenesis of fatigue in hemodialysis patients is still not fully understood, but several hypotheses could explain the phenomenon. Fatigue in hemodialysis patients is also thought to be related to rapid changes in osmolality and body fluids. Another hypothesis explains the imbalance of the hypothalamic, pituitary, and adrenal axes as regulators of the neuroendocrine system which regulates various immune, emotional, physiological, and chemical aspects of the body⁵. Fatigue reduces an individual's capacity to perform daily tasks, affecting their self-esteem and quality of life²⁹. Fatigue in hemodialysis patients may be affected by multiple factors, including age, physiological states, lifestyle, and physical activity levels.^{4,30}

Description of Respondent Based on Family Support

This study, resulting from the analysis of the family support questionnaire, determined that a significant percentage of regular hemodialysis patients (62%) receive good family support. This result is consistent with Rosyidah's study¹⁷, which revealed that 50% of regular hemodialysis patients have good family support. A Research in China also shows that families play a role in providing care, financial support, and transportation assistance to hemodialysis patients, even if they do not live together. Patients' quality of life improves when they receive good family support.³¹

According to Friedman in Susanto (2022), family support can be grouped into four categories. First,



appraisal or esteem support involves the family assisting members by providing feedback, guidance, understanding situations, and helping those who are ill or under stress. Second, instrumental or financial support is when the family provides material needs, goods, or services to address issues being faced. Third, informational support is where the family shares essential information, offering solutions, suggestions, and advice to the patient. Finally, emotional support involves creating a comfortable, safe, and peaceful environment filled with love, empathy, encouragement, and self-confidence, helping the patient feel valued.¹⁴

Hemodialysis patient's family can provide direct support by reminding patients of their hemodialysis schedule, encouraging them to limit fluid intake, and investigating possible side effects and symptoms of hemodialysis. Families can also help reduce stress and anxiety by providing emotional support, advice, and encouragement. This support may enhance the quality of life for patients and increase the success of treatment outcomes.

Association Between Family Support and Fatigue of Hemodialysis Patients

This study revealed a significant association between family support and fatigue in patients undergoing regular hemodialysis ($r=0,378$; $p<0,001$). This result aligns with the findings of Garwai et al., which indicated that the most significant social support for hemodialysis patients came from their families ($r=0,270$; $p=0,030$).³² This study demonstrated the correlation indicates a moderate relationship between family support and fatigue level. This finding is understandable because of the multifactorial etiology of fatigue in hemodialysis, such as inflammation, anemia, and comorbidity. Psychosocial resources significantly shape symptom perception, coping mechanisms, and overall quality of life for hemodialysis patients.³³ Therefore, although the statistical strength is moderate, its practical significance lies in identifying family support as a modifiable target that complements biomedical management in reducing fatigue severity among regular hemodialysis patients.

An essential element in managing fatigue in hemodialysis patients is family support, which plays a critical role in providing empathy and care. Family support includes interactions from partners or kids

that provide economic or instrumental assistance, either direct or indirect.³⁴ Family support not only helps to meet the patient's physical and emotional needs but also offers a sense of security and motivation, which can reduce stress and anxiety. This emotional reinforcement is especially important, as patients with chronic kidney disease often struggle with psychological challenges that can exacerbate their fatigue. As the closest source of external comfort, family members help create an environment where the patient feels valued and supported, leading to improved psychological well-being and better overall health outcomes.³⁵

Family support has a positive effect on providing support for the patient's daily needs, enhancing psychosocial functioning, influencing adherence to therapy, and enhancing the patient's overall quality of life. This support can be both verbal and nonverbal, including physical presence and other emotionally uplifting activities that provide emotional benefits, which influence the patient's behavior. This support is associated with the fatigue experienced by the patients, where those patients with a lack of family support tend to have a higher risk of suffering fatigue.^{15,36}

Strength and Limitations

The strength of this study lies in its focus on individuals undergoing regular hemodialysis, providing a more comprehensive understanding of fatigue, which a prevalent side effect of hemodialysis. However, limitations include possibility of biases in self-reported data and the sample's demographic diversity, which could impact the applicability of this findings. Future research should explore additional factors influencing fatigue, such as sleep quality, depression, and physical activity. Since family support has been shown to alleviate the severity of fatigue, it is recommended that families actively provide support to those undergoing hemodialysis.

CONCLUSION

The analysis indicates a significant association between family support and fatigue in patients undergoing regular hemodialysis. Therefore, it can be concluded that family support plays a important role in influencing fatigue severity in hemodialysis patients.



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CONFLICT OF INTEREST

The authors declared there is no conflict of interest.

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ETHICAL CLEARANCE

This study had received ethical clearance from the Ethics Committee of the Faculty of Medicine, Universitas Sumatera Utara, Medan (No. 787/KEPK/USU/2024) on 4th July 2024.

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