Prevalence of Fatigue Among Patients with End Stage Renal Diseases with Special Emphasis on Quality of Life

Rafiullah[1], Zahida Jamal[2], Javed Iqbal[3], Aymen Rahat[4], Amir Sultan[5]
Sheraz Khan[6], Fayaz Ahmed[7] and Hassan Karim[8]

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Abstract

Hemodialysis patients who adhere to a rigorous dialysis treatment plan, including dialysis, are prone to fatigue, which significantly influences their quality of life. Fatigue affects 60% to 97% of individuals with ESRD undergoing hemodialysis (HD). The study design was cross-sectional descriptive and was conducted in the Institute of Kidney Diseases Peshawar and Saidu Group of Teaching Hospitals from February to May 2023 using simple random sampling among 230 participants. The data was gathered using the Piper Short Scale-12, a valid and reliable tool with a reliability level of 0.87 to 0.89. Frequencies and percentages were used for categorical variables, and mean and standard deviation were used for continuous variables. Pearson correlation is used to calculate the relationship between demographic variables and fatigue using SPSS 20.0. In the current study, the maximum number of patients' fatigue scores were moderate (67%), followed by severe fatigue (18%), while the remaining (13%) patient level of fatigue was low. In the moderate (36%) and extreme fatigue levels (10%), more patients are aged 18–35. The maximum mean score among the fatigue domains was behavioral (5.5 ± 1.1), while the overall mean score was 4.8 ± 0.95. The study concluded that most dialysis patients suffer from moderate fatigue, which is moderately positively correlated with marital status. At the same time, there is no correlation between fatigue with age and education and a mildly negative correlation with gender and employment. It is also established that individuals with end-stage renal disease (ESRD) have shown that fatigue is a significant problem that must be addressed to improve poor health outcomes and quality of life.

Keywords: Fatigue, Chronic Kidney Diseases, End Stage Renal Diseases, Quality of Life.

Introduction

The advancement of chronic kidney disease (CKD) and its development into this fatal sickness, ESRD (end-stage renal disease), remains a massive reason for decreased personal satisfaction and early mortality (Jin et al., 2015). When chronic kidney diseases are left untreated, they progress to ESRD. End-stage renal disease is defined as "the presence of both factors (glomerular filtration rate [GFR] less than 60 mL/min and albumin greater than 30 mg per gram

[1]*Managing Director, Ayub International College of Nursing and Allied Health Sciences. Email: rafipyo99@gmail.com*
[2] *Charge Nurse, DHQ Hospital Chitral. Email: zoharehman2020@gmail.com*
[3] *Nursing department, Communicable Diseases Center, Hamad Medical Cooperation Doha, Qatar. Email: javedbhatti62@gmail.com*
[4] *Registered Nurse, National Institute of Cardiovascular Disease Karachi. Email: arahat2022@gmail.com*
[5] *Principal/Assistant Professor, Tasleem College of Nursing and Health Sciences Swat, KPK, Email: amirsultan204@gmail.com*
[6] *Principal/Assistant Professor, Elizabeth Rani College of Nursing and A.H.S Mardan*
[7] *Nursing Department, Saidu Group of Teaching Hospital Swat, KPK. Email: starfayaz0313@gmail.com*
[8] *Registered Nurse in Rehman Medical Institute (RMI). Email: hassankarim885@gmail.com*

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of creatinine) along with abnormalities of kidney structure or function for greater than three months, which signifies chronic kidney disease. Furthermore, GFR less than 15 ml/min is considered ESRD (Scott et al., 2018); (Sgambat et al., 2019). One of the most common treatments for long-term vital organ replacement is maintenance dialysis for ESRD, which is regarded as the most expensive treatment in current medical practice. Due to an increase in the number of elderly and diabetic patients worldwide, the number of people with end-stage renal disease (ESRD) on maintenance dialysis has skyrocketed in recent decades (Jin et al., 2015). In Pakistan, approximately 20,000 deaths occur yearly due to CKD (The Nation, 2017).

Patients receiving renal replacement therapy have varying degrees of disease severity, affecting their physical and mental health and quality of life. Mental changes include emotional issues related to the social impact of treatment, psychological distress, and a poor mental health assessment. Furthermore, changes brought on by dialysis include limitations in physical activity, self-care, and social activities; severe pain; frequent bouts of fatigue; and a poor self-evaluation of one's physical health (Kraus et al., 2016). Infection, cardiovascular and bone disease, metabolic changes, and other complications are more likely to occur in hemodialysis patients with chronic renal disease (Yang et al., 2018). Among all the factors associated with dialysis in chronic kidney diseases, fatigue is often cited as one of the worst, limiting their ability to perform daily activities and improve their quality of life (Flythe et al., 2018; Jacobson et al., 2018).

Fatigue is defined as "a subjective, overwhelming feeling of exhaustion at rest, exhaustion during activity, a lack of energy that impedes daily tasks, a lack of endurance, or a loss of vigor that can be unpleasant, distressing, and can hinder physical and social activity" (Finstere & Mahjoub, 2014). Patients on hemodialysis frequently experience fatigue, which harms their quality of life (Debnath et al., 2021). It affects 60 to 97 percent of hemodialysis patients (Ju et al., 2020). A general feeling of exhaustion is brought on by these patients' decreased levels of physical activity, low functional capability, and general muscle weakness (Zyga et al., 2015).

For ESRD patients, it is difficult to explain the idea of fatigue because symptoms vary from person to person. Because patients have limited functional capability (van der Borg et al., 2021), they cannot work, care for their families, or achieve personal goals, which causes them stress and frustration (Ramer & Scherer, 2020). As a result, fatigue harms their physical, mental, and social well-being and their life satisfaction. However, fatigue in dialysis patients is frequently ignored and untreated due to the subjective nature of symptoms (van der Borg et al., 2021).

A minimal body of literature is available in Pakistan; therefore, the study was conducted to determine the level of fatigue among patients who continuously conduct dialysis.

Methodology

The design for this study was a descriptive cross-sectional design, which was conducted in three tertiary care hospitals in Khyber Pakhtunkhwa. The study participants were patients diagnosed with end-stage renal diseases and routinely conducted dialysis. The study sample was calculated using a 95% confidence level with 5% error and 80% prevalence, which was 241, but the data of 11 participants needed to include some information. Therefore, they were excluded from the calculation, and therefore, 230 was the final sample size for the study using the simple random sampling method.

Those patients who conduct two sessions weekly and conduct dialysis for a minimum period of 6 months and aged 18 and above were the inclusion criteria for the study, while patients mentally unstable, comatose, having physical deformity (amputation or fracture) or receiving chemotherapy or radiation and those who are not willing to participate were excluded from the study.

The data collection method contains two parts: the participant's demographic data. In contrast, part B contains the piper fatigue short scale, which contains only 12 items with different responses from 1 to 10 according to the nature of the question. The scale contains four domains: behavioral (6 items), affective (1 item), sensory (1 item), and cognitive (4 items). The reliability of the PFS-12 subscales ranged from 0.87–0.89 (Bryce et al., 2012).

The data collection process was initiated after getting approval from the respective settings. The list of patients who will come for dialysis was marked with a specific number to assess the patient for inclusion criteria. Then, a checklist containing 12 items was given to the patient in the presence of their staff and attendant.

Data was analyzed through SPSS 20.0 as categorical and inferential statistics; categorical statistics contain frequencies, percentages, mean, and standard deviation; and inferential statistics contain Pearson correlation to explore the relationship of fatigue with selected variables.

The institutional review board approved the study, while permission was granted from each study setting for data collection. The aim and objectives of the study were explained to the patient in the presence of their attendant and dialysis staff. Before data collection, each patient was informed that their participation was voluntary, their identity and data would be kept confidential, and they had the right to leave the study. After obtaining informed consent, the data was collected through a checklist.

Results

The total number of participants in this study was 230, with a higher number of male patients (56.1%) than female patients (43.9%). The mean of the participants was 42.2 ± 15.6, while in categories, the patients aged 18–35 years were in the majority (46.5%), followed by those aged 36–60 (34.8%), and those aged 61 years and older (18.7%). The maximum number of patients with marital status were married (64.8%), followed by single-status patients (19.6%) and divorced or widowed (15.7%). Most of the patients had no job or were housewives (66.5%) in terms of professional status, while there was a higher number (38.3%) in the education category. In comparison, the maximum number of patients (47%) had hypertension as a co-morbid and risk factor. (See table 1)

Table 1: Demographic data of the participants

Categories		Frequency (n=230)	Percentage
Age	Mean ± SD	42.2 ±15.6	
	18 – 35 years	107	46.5%
	36 – 60 years	80	34.8%
	61 years and above	43	18.7%
Gender	Male	129	56.1%
	Female	101	43.9 %
Marital status	Single	45	19.6%
	Married	149	64.8%
	Widow/divorced	36	15.7%
Profession	Job less	153	66.5%
	Businessman	26	11.3%
	Retired	32	13.9%
	Government employee	19	8.3%
Education	Illiterate	88	38.3%
	Primary	76	33%

	Matric	51	22.2%
	Intermediate	15	6.5%
Risk factors	DM	38	16.5%
	HTN	108	47%
	Renal stones	18	7.8%
	Others	66	28.7%

Assessment of Fatigue Among the Participants

According to the short scale, the total number of items on the checklist was 12, having a 1–10 point Likert scale with different responses according to the background of the question. As the patient's score increases, the level of fatigue has increased.

In the behavioral domain, the maximum level of fatigue was (6.6 ± 1.2) in item B2, where patients report that fatigue affects their activities, followed by the mean score of B6, where patients answer that the intensity of fatigue is severe, then the mean score (5.8 ± 1.7) of B3, "fatigue affects my social activities among my social circle, and the mean score of (5.7 ± 1.5) of B1, "fatigue leads to distress. (See Table 2).

The overall mean score was (4.8 ± 0.95), which shows that the level of fatigue among the participants was moderate. Among the four domains of the fatigue checklist, the maximum mean score was reported in the behavioral domain (5.5± 1.1), followed by the mean score of the sensory domain (5.1± 1.1), the affective domain mean score (4.7± 1.1), and the cognitive domain was (3.9± 1.1) (see table 2).

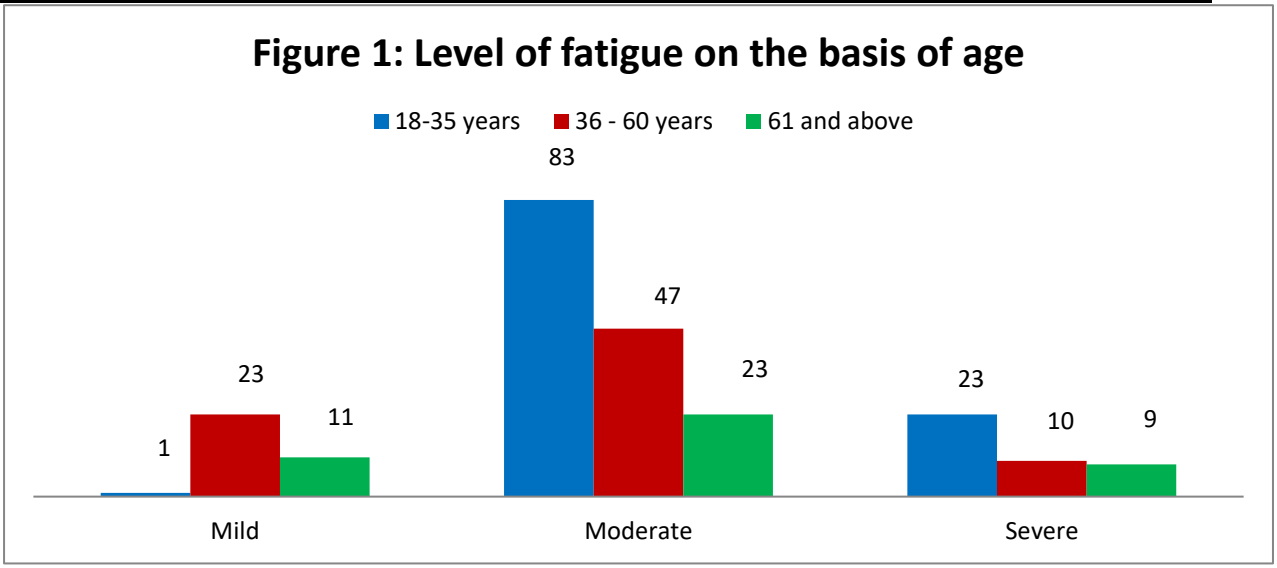
Table 2: Mean score of the each item of the fatigue

Domains	#	Items	Mean ± SD	Overall Mean
Behavioral	B1	Degree of fatigue that leads to distress?	5.7 ± 1.5	5.5 ± 1.1
	B2	As fatigue interfere your activities?	6.6 ± 1.2	
	B3	As fatigue affect your social circle?	5.8 ± 1.7	
	B4	As fatigue affect your sexual activity?	4.1 ± 2.09	
	B5	As fatigue affect your activities of enjoyment?	5.4 ± 1.5	
	B6	Degree and intensity of your fatigue	5.9 ± 1.5	
Affective	A7	Experience of fatigue (pleasant to unpleasant)	4.7 ± 2.0	4.7 ± 2.0
Sensory	S8	Your feeling (Strong to weak)	5.1 ± 1.2	5.1 ± 1.2
Cognitive	C9	Your feeling (Patience to impatience)	5.5 ± 1.2	3.9 ± 1.2
	C10	concentration (able to unable)	3.5 ± 1.7	
	C11	Remember (able to unable)	3.3 ± 1.9	
	C12	Thinking (able to unable)	3.3 ± 2.0	
Overall Mean score ± SD				4.8 ± 0.95

Level of Fatigue Based on Age

Figure 1 illustrates that among the mild levels, the maximum number of participants (10%) (n = 23) was 36–60 years in the group. In the moderate and severe levels of fatigue, the higher number of patients aged 18–35 years was (36%) n = 83 in moderate, while (10%) n = 23 in severe. (See figure 1).

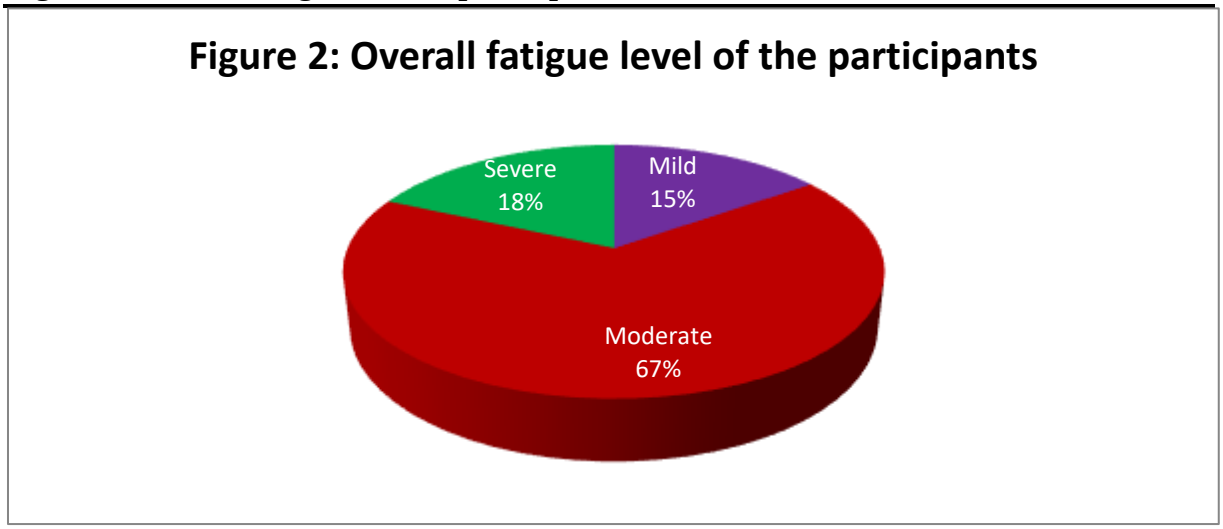
Figure 1: level of fatigue on the basis of age



Overall Fatigue Level of the Participant

Figure 2 illustrates that the majority of the patients level of fatigue was moderate, followed by a severe level of fatigue, and only 15 had mild fatigue.

Figure 2: Overall fatigue level of participants



Correlation of Fatigue with Selected Variables

A Pearson correlation test was applied to identify the association of fatigue with selected variables. Table 3 illustrates that fatigue is negatively and mildly correlated with gender and employment status while having a positive and mild relationship with marital status and ESRD. On the other hand, there is no relation between fatigue and age and education.

Table 3: Correlation of fatigue with selected variables

Variables	1	2	3	4	5	6	7
1: Age	-	-.452	.506	-.258	-.245	-.196	.002
2: Gender		-	-.030	.048	.509	.137	-.004
3: Marital status			-	-.350	-.093	.098	.076
4: Education status				-	-.210	-.316	.002
5: Employment status					-	.162	-.058
6: Cause of ESRD						-	.195
7:Fatigue							-

Discussions

In the current study, the total number of participants was 230, and the number of male patients was higher (56.1%) than female patients (43.9%). The mean age of the participants was 42.2 ± 15.6, while most (46.5%) were in the 18–35 age group. To support the selection, a study reveals that the majority of the participants were male (75%), while the majority of the participant's age group was above 70 years (43%) (Tsirigotis, et al., 2022). Another study also illustrates that the mean age of the patients was 54.8 ± 12.8, while most participants were male (52.2%) (Debnath, et al., 2021). A study conducted in Brazil showed a different selection, where the number of female participants was high (55.8%), while the mean age was (56.4 ± 14.3) (Burdelis, et al., 2023).

The current study demonstrates that the overall mean score of the patient's fatigue was (4.8 ± 0.95). While the majority of the patient's level of fatigue was moderate (67%), followed by severe (18%) and mild (15%), A study conducted in Pakistan supports our study, where the pre-intervention fatigue score among the participants was 61.70% moderate, 20% of the patient's fatigue score was severe. Only 18.3% of the patient's fatigue was mild (Akhtar et al., 2023). A study conducted to identify the effect of the educational intervention on the level of fatigue among dialysis patients supports our findings that the level of fatigue was high among the intervention (7.24±1.62) and control groups (7.71±1.35) (Devevi & Aydin 2022). Another study determined that a very high rate of fatigue was observed in hemodialysis patients, ranging from 65.4% (n = 25) to 92.9% (25-28), with approximately one-third of patients experiencing high levels of fatigue (Biniaz, et al., 2013). Three parameters are used to identify the level of fatigue among dialysis patients; the findings determine that the majority of the patients (47.3%) were having fatigue, 38% were having no fatigue, and 13.7% were suffering from extreme fatigue. The overall mean score of the patient's fatigue was 24.999 ± 8.0 (Zyga et al., 2015). A study conducted in Indonesia reveals that the overall mean score of the patients was 6.31 ± 0.15. Due to the complex mechanism by which a lack of education is linked to fatigue, these patients may not have as much access to healthcare or have trouble understanding health information (Mardiyah & Azmy, 2022). Other studies have shown that fatigue affects daily activities more and more as HD patients' general fatigue level rises (Horigan et al., 2013; Heidarzadeh, et al., 2010).

The current study determines that fatigue has a mild positive relationship with marital status, no association with age or education, and a mild negative relationship with gender and employment. The fatigue level affecting marital status is fundamental for healthcare workers to address. It is essential to remember that spouses experience emotional and psychological distress due to hemodialysis-related issues, which means that patients on long-term hemodialysis frequently experience difficulties in their marital relationships. A study conducted by Zyga, et al. (2015) reported that there was no statistical significance between fatigue and age, which means that gender did not affect fatigue level; furthermore, the study illustrated that some domains of fatigue are correlated with education, while there was a

statistical difference between fatigue and profession, and place of residence also affects fatigue (Zyga, et al., 2015). The study by Tsirigotis et al. (2022) illustrates that patients with only a high school education and those with little or no knowledge of their health issues were statistically significantly more likely to experience physical or mental exhaustion. Patients' capacity to comprehend health-related information can be viewed in the context of its association with education level (Tsirigotis, et al., 2022). Dinh, et al. (2022) and Riordan et al. (2021) reveal in their findings that the complex mechanism by which a lack of education is linked to fatigue makes it possible that these patients do not have as much access to healthcare or have trouble understanding health information. They might also have trouble learning how to take care of them, which worsens things and increases symptoms (Dinh, et al., 2022; Riordan et al., 2021).

Conclusion

Fatigue is a common and distressing symptom in the current study across various renal diseases. Most findings have focused on dialysis patients' exhaustion, which suggests that the etiology and risk factors of fatigue in this patient population are still poorly understood. In contrast to other domains, the behavioral domain is influenced by the patient's perception that their sexual life, social circles, and activities are compromised due to the disease process. It is followed by the sensory domain, where the patient perceives a loss of strength and power; the affective domain, which is characterized by an unpleasant environment; and the cognitive domain, where the patient perceives themselves as inpatients because of a lack of concentration that makes it difficult for them to remember and think clearly. The study also found that the only variable having a moderately positive link is marital status, while there is no correlation between fatigue with age and education and a mildly negative correlation with gender and employment.

Recommendations

Future research must investigate the most effective way to measure fatigue in this patient population to establish a gold standard measure and improve the capacity to compare and generalize findings. The potential bidirectional nature of variables (physical activity, depression, and social support) linked to fatigue indicates that a link cannot be established without additional research.

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