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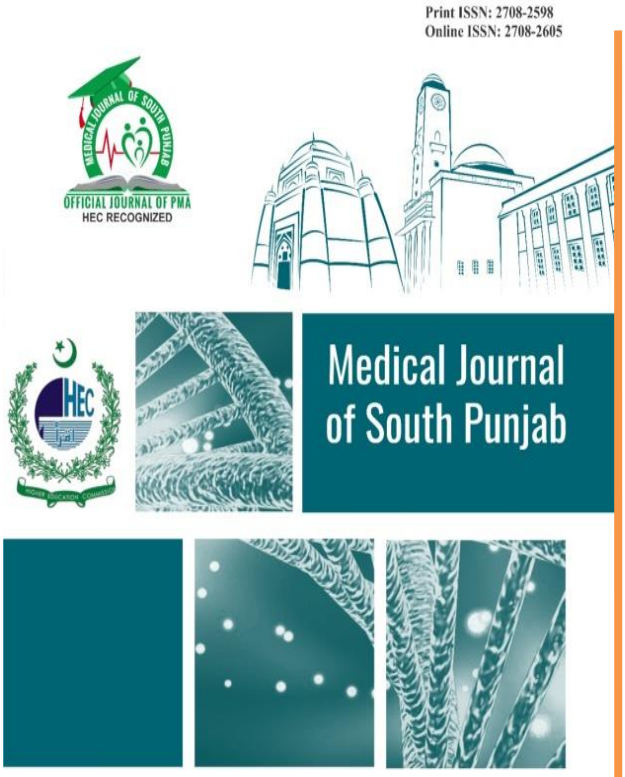

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Original Article

A study to assess quality of life in end stage renal disease patients undergoing hemodialysis: A single center study

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ABSTRACT

Objective: To assess the quality of life in patients with end-stage renal disease (ESRD) undergoing maintenance hemodialysis and to identify factors influencing it.

Methods: Study was descriptive cross-sectional commenced at the Multan Institute of Kidney Diseases, Multan, from October 25, 2024, to April 24, 2025. Study included 100 patients with ESRD having age ≥18 years, on hemodialysis from least three months. Main variables of study were demographics, duration of dialysis, vascular access type, co morbidities and the Kidney Disease Quality of Life Short Form (KDQOL-36) scale.

Results: The mean age of participants was 49.2 ± 11.3 years, with 62% males and 38% females. Most patients (72%) received hemodialysis three times per week, and hypertension (68%) was the most common comorbidity. The mean score of physical and mental component were 43.25 ± 9.12 and 47.36 ± 8.74, respectively. Patients of young age on dialysis for ≤12 months, and individuals without comorbidities had significantly higher quality of life scores ($p < 0.05$).

Conclusion: Quality of life among ESRD patients on hemodialysis is moderately reduced, particularly in physical and psychological domains. Older age, prolonged dialysis duration, and comorbidities are key predictors of poor outcomes.

Keywords: corticosteroids, severe community acquired pneumonia (SCAP), efficacy.

1. INTRODUCTION

End-stage renal disease (ESRD) is the last and irreversible stage of chronic kidney disease (CKD), in which the kidney function is not enough to maintain life without a renal replacement therapy[1]. One of treatment options is hemodialysis, which has been the main form of therapy for removing metabolic waste products and maintaining fluid and electrolyte balance[1]. Nevertheless, while hemodialysis increases survival it is accompanied with substantial physical, psychological and social burdens for the patients[2]. Moreover, the chronic nature of the condition and lifelong dependency on dialysis profoundly affects their overall well-being and quality of life (QoL)[3].

Quality of life emerged as an important outcome measure in the care of ESRD, above and beyond the classic clinical parameters or biomarkers as dialysis adequacy[4]. It represents patient's self-assessment of their physical, mental, social functions. The WHO defines it as personel perception about position of life in society and culture and achievement of life goals[5,6]. The repeated treatment schedules, special diet, fatigue and comorbidities in hemodialysis patients all contribute to a lower QoL compared with the general population[7].

In addition, patients with ESRD on hemodialysis have multiple psychosocial problems. Depression, anxiety, social distancing and financial struggle are common and may worsen the feeling of illness burden[8]. Physical signs like muscle cramps, weakness, and disrupted sleep are additionally disruptive to everyday life. Family relations and work options may also suffer, adding to loss of independence and diminished overall well-being. Therefore a holistic patient care would require complete information about the multidimensional effects of hemodialysis on patients' QoL[9].

The balance of clinical and non-clinical factors affecting QoL in ESRD patients has been emphasized by recent research. Interventions (patient education, psychosocial support, nutritional counseling and tailor-made dialysis care) can effectively improve patients' functional and emotional status[10].

The aim of this study is, therefore, to assess health related quality of life among ESRD patients on HD. By revealing most vulnerable domains and the factors related to low QoL, which helps us gain evidence contributing to providing a multidimensional approach for treatments of clavicle fractures. Finally, the quality of life in patients with ESRD is not less important than survival because it influences aspects such as motivation, treatment compliance, and general sense of dignity and well-being.

2. METHODOLOGY

This cross-sectional study was descriptive in nature as it aimed at determining the quality of life of patients with end-stage renal disease (ESRD) receiving hemodialysis. It was conducted in the Multan Institute of Kidney Diseases, Multan, a tertiary care hospital. Six months was the study period which commenced on October 25, 2024, to April 24, 2025. The principles of ethics were also strictly observed during the study. The aim and the goals of the research were explained to the participants in full and the confidentiality of personal information was guaranteed. No one was compelled to take part, and patients had the choice of dropping out of the study at any point without considering their future medical care.

Using the OpenEpi software, the calculation of the sample size was done based on the prevalence of quality-of-life outcomes in ESRD patients as good among 25% patients[11], and CI 95% 80% power. Data were collected after the institutional review

committee granted ethical approval and collected data in the regular dialysis sessions. All subjects gave a written informed consent before enrollment. The questionnaire employed to collect the data contained demographic data including age, sex, education, occupation, and social economic status, and clinical data including the number of dialysis sessions, the number of dialysis sessions, and the presence of comorbidities.

All patients diagnosed with ESRD and receiving maintenance hemodialysis during the study period were considered for inclusion. Patients aged 18 years and above who had been on regular hemodialysis for at least three months and who gave informed consent were included in the study. Patients with acute kidney injury, those undergoing peritoneal dialysis, or those with severe psychiatric illness or cognitive impairment that could hinder questionnaire responses were excluded. A non-probability consecutive sampling technique was used to recruit participants fulfilling the inclusion criteria.

Data was analyzed through SPSS version 25. Numerical variables such as age, CURB-65 scores, Hb, TLC, duration of antibiotics and length of hospital stay were expressed as mean and standard deviation. Categorical variables such as gender, extent of consolidation, associated findings on chest x-ray, and efficacy were presented as frequency and percentage. Confounding variables were controlled through stratification of data with regard to age, gender, extent of consolidation and associated findings on chest x-ray. Post stratification student t-test, chi square test were applied. P ≤0.05 was taken as statistically significant.

All collected data were entered and analyzed using the SPSS version 27. Quantitative variables such as age and duration of dialysis were presented as mean ± standard deviation, while categorical variables like gender and comorbidities were expressed as frequencies and percentages. Association of outcomes was analyzed chi-square and independent t-test, with a p-value of less than 0.05 considered statistically significant.

3. RESULTS

In this study 100 end-stage renal disease (ESRD) patients were included who are under maintenance hemodialysis to determine their quality of life. Most of the patients were male (62%) and aged 46-60(37%). Majority of the participants were married (82%), unemployed (73%), and were at secondary level (32%) education. Clinically, one-third of the patients were under hemodialysis between 7-12 months whereas three-quarters of the patients were under dialysis 3 times a week. The most frequent comorbidities were hypertension (68%) and diabetes mellitus (45%), and arteriovenous fistula constituted the majority of types of vascular access (70%).

Quality of life assessment using the KDQOL-36 questionnaire showed moderate impairment across all domains. The mean Physical Component Summary (PCS) score was 43.25 ± 9.12, and the Mental Component Summary (MCS) score was 47.36 ± 8.74. Younger patients (≤45 years) and those on dialysis for 12 months or less demonstrated significantly higher QoL scores ($p = 0.041$ and $p = 0.030$, respectively). Patients with comorbid conditions had lower QoL compared to those without ($p = 0.022$). Overall, the findings indicate that increasing age, longer dialysis duration, and presence of comorbidities negatively affect the quality of life in ESRD patients, emphasizing the need for holistic management strategies that address both medical and psychosocial aspects of care.

Table 1: Demographic Characteristics of Patients (n = 100)

Variable	Categories	Frequency (%)
Age (years)	18–30	15 (15%)
	31–45	28(28)
	46–60	37 (37)
	>60	20 (20)
Gender	Male	62 (62)
	Female	38 (38)
Education level	Illiterate	20 (20)
	Primary	24 (24)
	Secondary	32 (32)
	Graduate or above	24 (24)
Occupation	Employed	27 (27)
	Unemployed	73 (73)
Marital status	Married	82 (82)
	Unmarried	18 (18)

Table 2: Clinical Characteristics of Patients

Variable	Categories	Frequency (%)
Duration on hemodialysis (months)	3–6	26 (26)
	7–12	33 (33)
	13–24	25 (25)
	>24	16 (16)
Frequency of dialysis sessions per week	Two	28 (28)
	Three	72 (72)
Co morbidities	Hypertension	68 (68)
	Diabetes mellitus	45 (45)
	Cardiovascular disease	22 (22)
	None	10 (10)
Vascular access type	AV fistula	70 (70)
	Permanent catheter	30 (30)

Table 3: Mean Scores of KDQOL-36 Domains

KDQOL-36 Domain	Mean ± SD
Physical Component Summary (PCS)	43.25 ± 9.12
Mental Component Summary (MCS)	47.36 ± 8.74
Burden of Kidney Disease	41.78 ± 10.25
Symptoms/Problems List	52.41 ± 11.02
Effects of Kidney Disease	45.69 ± 9.87

Table 4: Association Between Quality of Life (Overall KDQOL Score) and Patient Characteristics

Variable	Categories	Mean QoL Score ± SD	p-value
Age (years)	≤45	49.21 ± 8.15	0.041
	>45	44.12 ± 7.89	
Gender	Male	47.85 ± 8.65	0.218
	Female	45.73 ± 9.02	
Duration on dialysis (months)	≤12	49.33 ± 7.42	0.030*
	>12	44.21 ± 8.11	
Comorbidities	Present	44.89 ± 7.93	0.022*
	Absent	51.03 ± 8.57	

4. DISCUSSION

The present study evaluated the quality of life in patients with end-stage renal disease (ESRD) undergoing maintenance hemodialysis at the Multan Institute of Kidney Diseases. The findings revealed that most patients experienced moderate impairment in their quality of life, particularly in the physical and psychosocial domains. The mean score of physical and mental component were 43.25 ± 9.12 and 47.36 ± 8.74, respectively, indicating that hemodialysis patients suffer considerable limitations in physical activity, emotional well-being, and daily functioning. These results are consistent with the findings of Joshi et al.[12] who reported that ESRD patients on hemodialysis had significantly lower physical and mental health scores compared to the general population.

In the current study, younger patients (≤45 years) demonstrated significantly higher quality of life scores compared to older individuals. This finding may be attributed to the greater physical resilience, fewer comorbidities, and better social functioning among younger patients. Similar observations were reported by Al Wakeel et al.[13] who found that older hemodialysis patients had poorer physical performance and increased dependency in daily activities. Furthermore, patients who had been on hemodialysis for more than one year had lower QoL scores than those who had recently initiated dialysis. This may be due to the progressive decline in health status, treatment fatigue, and psychological burnout associated with long-term dialysis, as highlighted by Anees et al[14].

The presence of comorbid conditions such as hypertension and diabetes mellitus was found to be significantly associated with reduced quality of life. These chronic illnesses add to the physical and emotional burden of ESRD, increase the frequency of hospital visits, and complicate disease management. Previous studies have shown that comorbidities play a major role in diminishing QoL among dialysis patients[15,16]. Moreover, although gender differences in QoL scores were not statistically significant in this

study, males tended to report slightly better outcomes than females, a trend also observed in the study by Theofilou et al.[17] who attributed this difference to variations in social roles and coping mechanisms.

The mean scores of the KDQOL-36 domains in this study reflect moderate impairment, which is comparable to the findings of Sehgal et al.[18] who emphasized that hemodialysis imposes restrictions not only on physical functioning but also on social interaction and psychological health. Similarly, Chow et al.[19] reported that fatigue, dietary restrictions, and loss of independence significantly reduce the overall QoL in hemodialysis patients. Depression and anxiety are common psychological consequences of chronic dialysis dependence, further worsening the patient's perception of well-being. A meta-analysis by Gerogianni and Babatsikou [20] demonstrated that emotional distress and social isolation are among the most influential factors leading to a decline in life satisfaction among ESRD patients.

Social support, counseling, and patient education have been shown to enhance adaptation and improve quality of life in dialysis patients. A study by Pagels et al[21] found that patients with stronger family and social networks exhibited higher levels of mental health and treatment adherence. These findings suggest that a multidisciplinary approach integrating medical care with psychological and social interventions is essential to address the multidimensional challenges faced by hemodialysis patients. Strengthening support systems and promoting patient empowerment may lead to improved outcomes and better coping with the burden of dialysis treatment.

5. CONCLUSION

Patients with end-stage renal disease undergoing hemodialysis experience moderate impairment in quality of life, mainly in physical and psychological aspects. Increasing age, longer dialysis duration, and comorbidities were associated with poorer outcomes. A patient-centered approach addressing medical, psychological, and social needs is essential to improve their overall well-being and treatment satisfaction.

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