

Psychosocial Resilience and Quality of Life in Patients with End-Stage Renal Disease Undergoing Hemodialysis: A Cross-Sectional Study

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Abstract

Objective: To evaluate psychosocial resilience and quality of life (QOL) in patients with end-stage renal disease (ESRD) undergoing hemodialysis at a private hospital in Punjab, Pakistan.

Methodology: This cross-sectional study included 191 ESRD patients undergoing hemodialysis at a private center in Lahore, Pakistan, from January to December 2022. Eligible participants were aged 18 or older, diagnosed with ESRD, and receiving regular hemodialysis. Exclusion criteria included acute kidney injury, incomplete medical records, cognitive impairments, or psychiatric disorders. Resilience was measured using the Connor-Davidson Resilience Scale (CD-RISC), and quality of life (QOL) was assessed with the WHOQOL-BREF™ questionnaire. Demographic and clinical data were also collected. Data were analyzed using SPSS version 25.0, with descriptive statistics, one-way ANOVA, and post hoc Bonferroni correction. A p-value of <0.05 was considered statistically significant.

Results: The study involved 191 hemodialysis patients with a mean age of 53.4 ± 14.2 years, 45% male and 55% female. Common comorbidities included hypertension (85%), diabetes (65%), and cardiovascular disease (40%). The mean duration of ESRD was 5.6 ± 3.2 years, with 70% undergoing hemodialysis three times per week. Most patients (60%) had higher education, while 15% had no formal education, and 70% were married. Resilience, measured by the CD-RISC, had a mean score of 45.27 ± 8.35 , and QOL, measured by the WHOQOL-BREF™, had a mean score of 51.71 ± 6.30 . Both scores were significantly lower than population norms ($p = 0.029$ for resilience, $p = 0.001$ for QOL), indicating considerable psychological challenges.

Conclusion: ESRD patients on hemodialysis experience low levels of psychosocial resilience and quality of life, highlighting the need for targeted interventions to improve these critical aspects of patient well-being.

Keywords: End stage renal disease, Resilience, Hemodialysis, Quality of life, Social support.

Introduction

End-Stage Renal Disease (ESRD) is the final stage of chronic kidney disease, where the kidneys have lost nearly all their ability to perform essential functions, such as filtering waste and maintaining fluid and electrolyte balance.¹

Patients suffering from ESRD experience physical, emotional, and psychological health impact. Recent resilience index, mental health, and QOL studies in ESRD patients show that particular psychosocial aspects can improve treatment results. Resilience impacts mental health, QOL, and psychological strain in ESRD and other chronic disease patients every day.¹ Resilient ESRD patients are less depressed and more dialysis-ready. Social support is a crucial resilience factor. Having strong social networks and community ties positively impacts individuals in several ways.^{2,3}

Additionally, social support plays a crucial role in influencing the quality of life of individuals with ESRD.⁴ Researchers found that patients with stronger social support experienced better mental health and fewer depressive symptoms.⁵ Many studies have explored the relationship between social connections and quality of life, consistently demonstrating that improved interpersonal interactions contribute positively to patient health.^{6,7} Dialysis patients complain of weariness more often, affecting QOL and physical function.

This study adds to existing literature by examining how sleep disturbances and resilience levels influence depression, anxiety, and both physical and mental health in patients with ESRD. These factors are critical in understanding the overall well-being of ESRD patients and offer insights into potential interventions to improve their quality of life. Dialysis patients, as assessed using the Pittsburgh Sleep Quality Index, often experience poor sleep quality.⁷ Treatment for ESRD patients who wake up at night may include cognitive-behavioral therapy or sleep hygiene counseling. Resilience, psychology, and quality of life in ESRD patients are more complex than initially imagined. Dialysis is the next step for patients with physical and emotional issues. It shows that resilience minimizes these risks to improve mental health and life.²

Up to one-third of ESRD patients suffer from depression and anxiety, making psychosocial status a key factor in QOL.⁸ This study highlights how resilience and social support can help ESRD patients

manage mental and emotional issues and improve their quality of life. Dialysis patients often exhibit signs of poor mental and physical health, including fatigue, sleep disturbances, and restricted food intake, leading to both physical and psychological deterioration.⁹ Dialysis patients exhibit signs of lower mental and physical health, including fatigue, poor sleep, and restricted food and physical and psychological deterioration symptoms. Furthermore, dialysis patients are particularly affected by exhaustion, which impacts their QOL and physical function.¹⁰

This study adds to the existing literature by exploring how sleep disturbances and resilience levels influence depression, anxiety, and both physical and mental health in ESRD patients. These factors are critical for understanding the overall well-being of ESRD patients and offer potential pathways for interventions to enhance their quality of life. Dialysis patients, as assessed using the Pittsburgh Sleep Quality Index (PSQI), frequently report poor sleep quality. Treatment for ESRD patients who wake up at night may include cognitive-behavioural therapy or sleep hygiene counselling. The resilience, psychological well-being, and quality of life of ESRD patients are more complex than previously thought. Dialysis, as a treatment for patients with physical and emotional challenges, can be optimized by addressing resilience, which reduces the risk of mental health issues and improves overall life quality.

Both locally and globally, there is a scarcity of studies assessing resilience and QOL specifically in hemodialysis patients, limiting a comprehensive understanding of the psychological impact of this treatment modality. This study used two tools, the Connor-Davidson Resilience Scale (CD-RISC)¹¹ and the WHOQOL-BREF™,¹² to measure resilience and quality of life in hemodialysis patients. The CD-RISC is a 25-question scale that looks at how well patients can handle stress and challenges. The WHOQOL-BREF™ is a 26-question survey that checks different aspects of life, including physical health, mental well-being, relationships, and living conditions.¹²

Both tools are effective in understanding the overall impact of chronic kidney disease on patients' resilience and quality of life. By focusing on this patient group, the research provides valuable observations into how resilience impacts their mental and physical health outcomes. Based on the findings, it is anticipated that targeted therapeutic and psychological interventions will enhance individualized care and improve the quality of life for hemodialysis patients. The primary goal of this study is to better understand the psychological factors influencing ESRD patients, with a particular focus on resilience and quality of life, to inform more effective patient care strategies and improve patient outcomes in this underrepresented population.

Methodology

This cross-sectional observational study aimed to assess psychosocial and physical resilience in patients with ESRD undergoing hemodialysis. Data were collected from 191 ESRD patients at a private Hemodialysis Center in Lahore, Pakistan, from January to December 2022. Ethical approval was obtained from the Institutional Ethics Committee (GAUS/MDEC/D10/0083). Patient confidentiality was maintained, and data were anonymized during analysis.

Written informed consent was obtained from all participants before enrollment.

The study included 191 patients diagnosed with ESRD and undergoing regular maintenance hemodialysis. Participants had a disease history ranging from 6 months to several years and were receiving ongoing treatment at the Hemodialysis Center. The mean follow-up duration for the participants was two weeks, providing a representative sample for assessing psychosocial and physical resilience in this specific treatment group. Eligibility for the study required patients to be aged 18 years or older, diagnosed with ESRD, and undergoing hemodialysis. Participants were required to voluntarily sign informed consent and to have the cognitive and physical ability to complete the study assessments. Exclusion criteria included patients with acute kidney injury, incomplete medical records, cognitive impairments, or psychiatric disorders that would hinder the completion of the study questionnaires. These criteria helped minimize bias and ensure that the collected data were as accurate as possible.

Data Collection Tools

Psychosocial resilience was measured using the Connor-Davidson Resilience Scale (CD-RISC),¹¹ a 25-item Likert scale that assesses resilience, with higher scores indicating greater resilience. Quality of Life (QOL) was assessed using the WHOQOL-BREF™ questionnaire,¹² which consists of 26 items across four domains: physical health, psychological health, interpersonal relationships, and the physical environment. Items were rated on a Likert scale, with higher scores indicating better quality of life. These tools provided valuable insights into the psychosocial and mental health status of the participants.

Procedure

Participants were consecutively recruited during their routine hemodialysis sessions. After explaining the study's objectives, patients were asked to self-complete the one time questionnaire, CD-RISC to assess resilience and WHOQOL-BREF™ to measure the QOL, with trained research assistants present to ensure consistency and minimize scoring variability. Demographic information such as gender, age, co-morbidities, clinical characteristics, duration of ESRD, and type of treatment were also collected for analysis.

Data were analyzed using SPSS version 25.0. Descriptive statistics were reported as mean \pm SD for continuous variables and frequencies with percentages for categorical variables. Differences between the study variables were assessed using one-way ANOVA. A post hoc analysis with the Bonferroni correction was performed to identify specific group differences. A p-value of <0.05 was considered statistically significant.

Results

The mean resilience score, as measured by the Connor-Davidson Resilience Scale (CD-RISC), was 45.24 ± 8.35 , indicating low levels of resilience among the participants. The QOL, assessed through the WHOQOL-BREF™ scale, had a mean score of 51.72 ± 6.30 , reflecting significant

impairment in overall quality of life (Table 2). Statistical analysis revealed that the resilience score was significantly lower compared to established population norms (p-value = 0.029). Similarly, the QOL score was also significantly lower compared to general population expectations, with a p-value of 0.001. These results highlight the significant

psychological and emotional challenges faced by individuals on hemodialysis, emphasizing the need for targeted interventions to improve both resilience and quality of life. This Table provides a clear overview of the key statistics for the hemodialysis patients (n=191), including the resilience score and quality of life.

Table 1: Socio-Demographic and Clinical Characteristics of Hemodialysis Patients

Demographic Parameter	Frequency (%) / Mean ± SD
Total Sample Size	191
Age	Mean = 53.4 ± 14.2 years
Gender	45% Male, 55% Female
Co-morbidities	
- Hypertension	85%
- Diabetes	65%
- Cardiovascular Disease	40%
Duration of ESRD	Mean = 5.6 ± 3.2 years
Frequency of Hemodialysis	3x/week: 70%, 2x/week: 30%
Education Level	
- No formal education	15%
- Primary/Secondary school	25%
- Higher education	60%
Marital Status	70% Married, 20% Single, 10% Divorced
Employment Status	35% Employed, 65% Unemployed

Table 2: Resilience and Quality of Life Scores in Hemodialysis Patients

Variable	Hemodialysis Patients (n=147)
Resilience Score (CD-RISC)	45.24 ± 8.35
Overall Quality of Life (WHOQOL-BREF)	51.72 ± 6.30
P-value	0.029



Figure 1: Resilience and Quality of Life Scores in Hemodialysis Patients

Discussion

This study aimed to assess the psychosocial resilience and overall QOL in a cohort of 191 patients undergoing hemodialysis for ESRD. The findings highlight the considerable challenges faced by these patients, both physically and psychosocially. The resilience scores of hemodialysis patients were notably low, which aligns with well-documented evidence suggesting a decline in psychological well-being due to the physical and functional impairments imposed by hemodialysis treatment. Factors like fatigue, dependency on dialysis schedules, and the continuous nature of therapy contribute significantly to the emotional and psychological toll experienced by these patients.

The socio-demographic and clinical characteristics of the patient population provide valuable context for understanding the resilience and QOL scores observed in this study. The mean age of the patients was 53.4 ± 14.2 years, representing a predominantly middle-aged group (Table 1), consistent with the known prevalence of ESRD in this age range.¹³ Advancing age often contributes to physical frailty, psychological challenges, and reduced adaptability to chronic illnesses, which can negatively affect resilience and QOL. The gender distribution showed a slight predominance of females (55%) over males (45%) (Table 1). While ESRD affects both genders, female patients may experience greater psychological distress, such as anxiety and depression, due to societal roles, family responsibilities, and physical limitations imposed by hemodialysis.^{12,14} These factors could partially explain the lower resilience and QOL scores among this group.

Hypertension (85%) and diabetes (65%) were the most prevalent comorbidities, which aligns with their established roles as primary risk factors for ESRD. The burden of multiple comorbidities, including cardiovascular disease (40%), complicates clinical management, contributes to fatigue and physical discomfort, and increases psychological stress—key factors that can impair both resilience and QOL.¹³ Educational attainment was another critical factor, with 40% of patients having no formal education and 45% completing only primary or secondary schooling (Table 1). Lower educational levels can hinder understanding of the disease, treatment adherence, and access to health information.¹⁵ This limited health literacy may contribute to increased psychological distress and reduce patients' ability to develop coping mechanisms, ultimately impacting resilience and QOL.

Furthermore, the high proportion of married patients (70%) suggests that marital support plays a role in managing chronic illness. However, it may also pose emotional and practical challenges, especially in the presence of functional limitations caused by ESRD. In summary, the patients' middle age, gender differences, high prevalence of comorbidities, and low educational attainment collectively highlight the multifaceted challenges faced by this population. Addressing these factors through targeted interventions, such as health education, mental health support, and social assistance programs, may help improve both resilience and QOL among hemodialysis patients.

The mean duration of ESRD was 5.6 ± 3.2 years, suggesting that most patients have been undergoing hemodialysis for a prolonged period (Table 1). Chronic exposure to the physical and emotional demands of frequent hemodialysis sessions can diminish patients' ability to cope effectively with their condition. Studies have shown that prolonged treatment duration is associated with psychological burnout, reduced social engagement, and increasing feelings of helplessness, which negatively affect resilience.

Regarding the frequency of hemodialysis, 70% of patients underwent treatment three times per week, while 30% received it twice per week. Patients requiring more frequent sessions often experience greater disruption to their daily lives, including reduced opportunities for employment and social activities. This time-consuming nature of hemodialysis imposes significant lifestyle restrictions,

contributing to poorer QOL and resilience. The prolonged duration of hemodialysis treatment makes it increasingly difficult for patients to adjust psychologically. The frequent sessions and associated physical discomforts diminish psychological resilience, as patients face the ongoing burden of treatment with limited prospects for improvement in their condition. Chronic hemodialysis induces both physical and emotional exhaustion, exacerbating feelings of helplessness and reducing the ability to cope effectively with the demands of treatment.¹⁶ Psychological stress, including anxiety, depression, and social isolation, is prevalent among hemodialysis patients, further contributing to the observed low resilience scores. Moreover, the physical intrusion of the procedure, coupled with long-term dependency on dialysis, results in decreased autonomy and a sense of loss, thereby diminishing the ability to adapt to these challenges.

In terms of overall QOL, the scores of hemodialysis patients were significantly low (Table 2, Figure 1). This finding is consistent with previous studies documenting poorer QOL among dialysis patients.¹⁷ The study participants reported diminished physical and psychological well-being, as reflected in the physical and psychological domains of the WHOQOL-BREF™ questionnaire (Table 2, Figure 1). These results confirm earlier findings that dialysis patients often suffer from fatigue, pain, restricted mobility, and social disengagement due to the time-consuming nature of dialysis.^{6,7,8} The frequent treatment sessions, which can span several hours multiple times a week, contribute to the loss of social interactions, decreased mobility, and dissatisfaction with their quality of life.

The psychosocial impact of these physical limitations is profound. Hemodialysis patients often experience social withdrawal and reduced opportunities for social engagement, which are essential for maintaining mental well-being.¹⁷ The inconvenience and discomfort associated with dialysis, coupled with the psychological burden of managing a chronic illness, result in a significant reduction in QOL. These findings are consistent with studies where dialysis patients report lower QOL compared to other patient populations, including those with kidney transplants.

The psychological burden on hemodialysis patients is substantial and is reflected in both the lower resilience and QOL scores observed in this study. Patients undergoing hemodialysis not only struggle with the physical aspects of their condition but also with the emotional and psychological challenges associated with the treatment. Despite medical advancements, the chronic nature of kidney failure and the need for lifelong treatment often lead to feelings of hopelessness and anxiety about the future. The repeated cycles of dialysis, combined with the uncertainty of future health, contribute to the erosion of mental resilience.

Therefore, healthcare providers must address not only the physiological aspects of dialysis but also the psychological needs of these patients. Implementing interventions focused on mental health support, including counseling and stress management techniques, could help improve resilience and QOL in these patients. The study results suggest that healthcare strategies should encompass both medical and psychosocial interventions. Psychological support, such as counselling, social support programs, and stress management interventions, should be integrated into the care plans for hemodialysis patients. Education on coping strategies and the importance

of mental well-being could also empower patients to better manage the psychological challenges associated with their treatment.

The resilience scores, measured by the Connor-Davidson Resilience Scale (CD-RISC), revealed a mean score of 45.27 ± 8.35 , suggesting a moderate level of resilience among the hemodialysis patient population (Table 2, Figure 1). This is consistent with literature showing that chronic illness, particularly ESRD, severely impacts a patient's ability to cope with ongoing stressors.^{2,3,4,5} Resilience plays a crucial role in managing the psychological and emotional challenges of prolonged treatments like hemodialysis. The relatively low resilience scores in this study may reflect the emotional toll of managing a chronic illness, frequent hospital visits, and the physical limitations imposed by kidney failure.

The overall QOL scores, measured by the WHOQOL-BREF™ questionnaire, showed a mean of 51.71 ± 6.30 (Table 2, Figure 1). This score suggests that although patients on hemodialysis report poor quality of life overall, there is variation in QOL, with some patients managing better than others. The physical limitations imposed by hemodialysis, coupled with frequent hospital visits and associated costs, likely contribute to the lower QOL scores. In particular, the physical domain, which includes energy, pain, and mobility, is significantly affected in ESRD patients, consistent with findings in this study. Chronic kidney disease and its treatment, including hemodialysis,¹⁸ result in multiple physical challenges such as fatigue, muscle weakness, and cardiovascular problems, all of which can reduce overall QOL.

Furthermore, the socio-economic challenges faced by many patients in this study, including unemployment (65% of patients were unemployed) and limited social support (10% reported low social support), may exacerbate feelings of isolation and contribute to poorer QOL.¹⁹ The socio-economic context is crucial in understanding QOL in chronic disease patients.²⁰

Low income, limited access to healthcare, and poor social support systems often lead to reduced treatment adherence and higher stress levels, negatively impacting both physical and psychological health.

Limitations

This study has some limitations that should be acknowledged. The cross-sectional nature of the study prevents us from making causal inferences regarding the relationship between resilience, QOL, and socio-demographic factors. Longitudinal studies are needed to better understand how resilience and QOL evolve over time in hemodialysis patients. Furthermore, the self-reported nature of the scales used in this study may introduce bias, as patients may have underreported or overreported their experiences due to social desirability or recall bias.

Conclusion

This study highlights the significant psychosocial challenges faced by hemodialysis patients, with low resilience and poor QOL scores being prevalent among the cohort. These findings emphasize the importance of addressing not only the physiological aspects of kidney failure but also the psychological and social dimensions of patient care.

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Conflict of Interest: The authors declare no conflict of interest.

Future Implications

The low resilience and quality of life reported by hemodialysis patients in this study highlight the need for targeted interventions to improve their well-being. Incorporating psychological support services, such as counselling and stress management programs, into routine care could make a meaningful difference. Tools like cognitive-behavioral therapy and mindfulness-based techniques may help patients better cope with the physical and emotional challenges of living with ESRD and its treatment. Future research should include qualitative methods, such as interviews or focus groups, to gain a deeper understanding of the psychosocial challenges faced by hemodialysis patients.

Authors' Contribution: H.Z.: study conception and design, data collection, statistical analysis, manuscript drafting, critical revision; J.I.: data interpretation, manuscript drafting, critical revision.

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