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MENTAL HEALTH OF PATIENTS WITH CHRONIC KIDNEY DISEASE UNDERGOING DIALYSIS AND THEIR CAREGIVERS: A CROSS-SECTIONAL STUDY

Original Research

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ABSTRACT

Background: Chronic kidney disease (CKD) is a progressive condition with rising global prevalence, often requiring long-term dialysis to sustain life. While dialysis extends survival, it imposes significant psychological and physical stress on both patients and their caregivers. Mental health issues such as anxiety, depression, and fatigue are common yet underrecognized consequences of this burden. Understanding the psychological impact of dialysis and the role of social support is essential to improving the quality of life and treatment outcomes for this vulnerable population.

Objective: To investigate the impact of dialysis frequency and duration on the mental health of CKD patients and their caregivers, and to assess the level of perceived social support among them.

Methods: A descriptive cross-sectional study was conducted at Ayub Teaching Hospital, Abbottabad, over two months, involving 167 participants, 84 patients undergoing dialysis and 83 primary caregivers. Consecutive sampling was used. Mental health was assessed using the Hospital Anxiety and Depression Scale (HADS), fatigue levels were evaluated with a Fatigue Pictogram, and perceived social support was measured using the Multidimensional Scale of Perceived Social Support (MSPSS). Data were analyzed using IBM SPSS version 22, with descriptive and inferential statistics applied to determine associations.

Results: Among patients, 23.4% experienced extreme fatigue, 17.4% had clinical anxiety, and 23.9% suffered from depression. Among caregivers, 10.2% reported extreme fatigue, 11.4% had anxiety, and 13.2% had depression. A significant association was observed between fatigue and duration of dialysis ($p = 0.022$), and between social support and dialysis frequency ($p = 0.010$). Moderate support was reported by 57.4% of participants, high support by 27.5%, and low support by 14.9%.

Conclusion: Dialysis patients and their caregivers face considerable psychological distress, with fatigue, anxiety, and depression being prevalent. Longer dialysis duration increases fatigue, while better social support correlates with improved mental health outcomes. These findings highlight the need for integrated psychological care in dialysis programs.

Keywords: Anxiety, Caregivers, Chronic Kidney Disease, Depression, Dialysis, Fatigue, Social Support.

INTRODUCTION

End-stage renal disease (ESRD) is a severe and irreversible condition characterized by the near-complete or total failure of kidney function, necessitating renal replacement therapies such as dialysis or kidney transplantation to sustain life and health (1). Despite remarkable advances in nephrological care, patients undergoing dialysis frequently report a wide range of physical, psychological, and social challenges. Fatigue, depressive symptoms, anxiety, and cognitive disturbances are recurrent complaints that persist throughout the disease trajectory. These difficulties extend beyond the individual to significantly impact caregivers and family systems, highlighting the multidimensional toll of chronic kidney disease (CKD) and its long-term management (2). While dialysis is a life-sustaining intervention, it imposes considerable psychological strain. Many patients experience mental health deterioration, particularly depression, which is alarmingly prevalent among this group and strongly associated with higher morbidity and mortality (3). Dialysis typically requires patients to attend sessions two to three times per week, each lasting several hours, which not only disrupts daily routines but also contributes to diminished autonomy and social engagement. Despite often maintaining stable physical health markers, patients commonly report impaired quality of life (QOL), especially in physical domains, whereas their mental health may appear relatively preserved in comparison to the general population. However, this perceived stability may mask underlying psychosocial distress, often overlooked or underdiagnosed (4).

Caregivers, often family members, play an indispensable role in the daily management of dialysis patients. This responsibility entails not only logistical and physical support but also emotional endurance, frequently at the expense of the caregiver's own well-being. The burden of caregiving can lead to emotional exhaustion, social isolation, and reduced QOL in several domains (5). Multiple contributing factors—ranging from the presence of comorbidities and repeated hospital admissions to restrictions in fluid and diet intake—compound patient distress and create a reciprocal strain on caregivers. In turn, caregivers are vulnerable to developing symptoms of anxiety, depression, and disillusionment, which are aggravated by disrupted family dynamics, financial dependency, and the chronicity of the caregiving role (6,7). Unaddressed psychological issues in either patients or caregivers not only reduce overall life satisfaction but also pose barriers to treatment adherence and long-term health outcomes. In many cases, the chronic nature of dialysis demands leads to a decline in socioeconomic status, marital instability, and a sense of helplessness. Patients often become reliant on caregivers, while caregivers themselves begin to feel emotionally burdened and conflicted, resulting in feelings of guilt, resentment, and fatigue. The psychosocial toll on caregivers is further influenced by demographic variables, their relationship with the patient, duration of care, and living arrangements (8,9). The mental health of caregivers, therefore, deserves equal clinical attention as that of patients, yet it remains inadequately explored in many healthcare settings, especially in lower-middle-income countries like Pakistan. Given this context, the current study seeks to investigate the mental health concerns—specifically anxiety, depression, and fatigue—among patients with CKD undergoing dialysis and their caregivers in a tertiary care hospital in Pakistan. The research aims to assess the impact of dialysis frequency and duration on patients' psychological well-being, quantify the intensity of emotional distress in both patients and caregivers, and explore the level of social support available to them. Findings from this study are expected to inform future clinical interventions and policy reforms aimed at mitigating mental health challenges in this vulnerable population.

METHODS

A descriptive cross-sectional study was conducted at Ayub Teaching Hospital, Abbottabad, over a two-month period to assess the mental health status of patients undergoing maintenance dialysis for chronic kidney disease (CKD) and their primary caregivers. A total of 167 participants were enrolled, comprising 84 patients and 83 caregivers, selected through a non-probability consecutive sampling technique. Ethical approval was obtained from the institutional review board of the hospital, and written informed consent was secured from all participants prior to data collection in adherence to ethical research standards. Eligibility criteria included patients and caregivers aged 18 years or older, with patients having a minimum of six months of dialysis history and a Glasgow Coma Scale (GCS) score of 15/15 to ensure full cognitive capacity for participation. Individuals were excluded if they were under 18 years of age, had a GCS score below 15, had undergone dialysis for less than six months, or were unwilling to provide informed consent. Data were gathered through structured face-to-face interviews in a private setting to ensure participant comfort and confidentiality. Sociodemographic and clinical information such as age, sex, duration of dialysis, education level, and comorbid conditions were collected using a pre-designed, selfstructured questionnaire. Mental health status was evaluated using three standardized instruments. Fatigue levels were assessed through the Fatigue Pictogram, a simple and patient-friendly visual scale. The Hospital Anxiety and Depression Scale (HADS), a validated screening tool, was employed to quantify anxiety and depression. Perceived social support was measured using the Multidimensional Scale of Perceived Social Support (MSPSS), which evaluates support from family, friends, and significant others. All data were analyzed using IBM SPSS version 22. Descriptive statistics were applied to summarize continuous variables as means and standard deviations, while categorical variables were presented as frequencies and percentages. Data visualizations, including tables and figures, were generated using SPSS and formatted in Microsoft Word to enhance clarity and facilitate interpretation.

RESULTS

A total of 84 patients undergoing dialysis and 83 caregivers were analyzed for demographic characteristics, fatigue levels, perceived social support, and mental health status. Among the patients, the majority were aged between 35 and 60 years (65.5%), followed by those aged 18–35 years (22.6%) and above 60 years (11.9%). Males comprised 69% of the patient group. Hypertension emerged as the most common underlying cause of CKD (67.9%), with diabetes, post-renal causes, iatrogenic causes, kidney infections, and congenital disorders constituting the remaining etiologies. Most patients (86.9%) incurred monthly treatment expenses between 0–10,000 PKR. Regarding dialysis frequency, 86.9% received dialysis twice per week, while only 9.5% and 3.6% underwent it thrice and once weekly, respectively. A majority (78.6%) had been diagnosed within the past five years. Among caregivers, 57.8% were aged between 18–35 years and 42.2% between 35–60 years. The caregiver population was also predominantly male (65.1%). Most caregivers reported spending 0–10,000 PKR monthly (80.7%), with 73.5% associated with patients diagnosed within the last five years. The frequency of dialysis among the patients they cared for mirrored the patient dataset, with 80.7% undergoing dialysis twice weekly. Fatigue levels revealed a marked disparity between patients and caregivers. While 23.4% of patients reported feeling extremely tired, only 10.2% of caregivers fell into this category. Conversely, 12.0% of caregivers reported no fatigue at all, compared to just 1.8% of patients. Activity limitations also varied notably: 41.3% of patients could perform “very little” of their daily activities, and none reported being able to perform “everything” they normally do. In contrast, 13.2% of caregivers reported no functional impairment in activity due to fatigue.
Perceived social support showed that most patients and caregivers reported moderate to high levels of support. Among patients, 31.1% experienced moderate support and 10.8% received high support. For caregivers, 26.9% reported moderate support and 16.2% reported high support. Only a small fraction of both groups (8.4% patients, 6.6% caregivers) reported low social support. Chi-squared analysis revealed that frequency of dialysis had a statistically significant association with perceived social support ($p = 0.010$), showing that increased dialysis frequency correlated with lower support levels. While fatigue, activity limitation, anxiety, and depression showed no statistically significant associations with frequency of dialysis ($p > 0.05$), moderate strength of association was observed between frequency and fatigue (Cramer’s V = 0.286). Similarly, depression showed a modest association (Cramer’s V = 0.200), though not statistically significant ($p = 0.151$). A significant relationship was also observed between duration of dialysis and fatigue levels ($p = 0.022$), with patients on dialysis for longer durations more likely to report higher fatigue. No significant associations were found between duration of dialysis and activity level ($p = 0.791$), anxiety ($p = 0.719$), depression ($p = 0.219$), or social support ($p = 0.995$), though fatigue remained a key burden with increasing dialysis duration. Regarding anxiety levels, 20.96% of patients had no symptoms, 11.96% were borderline, and 17.37% met criteria for clinical anxiety. Among caregivers, 26.95% had no anxiety, while both borderline and clinical anxiety were reported by 11.36%. Depression was more prevalent in patients, with 23.95% meeting criteria for depression, 9.58% being borderline, and only 16.77% classified as normal. Among caregivers, 13.17% had clinical depression, 12.57% were borderline, and 23.95% were within normal limits. The comparative analysis of anxiety and depression levels between patients undergoing dialysis and their caregivers revealed no statistically significant differences. Chi-square testing indicated that anxiety levels did not significantly differ between the two groups ($\chi^2 = 1.847$, $df = 2$, $p = 0.397$), suggesting a similar distribution of anxiety across patients and caregivers. Likewise, the difference in depression levels was also statistically non-significant ($\chi^2 = 3.882$, $df = 2$, $p = 0.144$), although the frequency of depressive symptoms appeared higher among patients in raw percentages. These results highlight that while the prevalence of psychological distress may vary descriptively, it does not significantly diverge statistically between these populations, underscoring the shared emotional burden of chronic kidney disease management.

Table 1: Demographics of patients and caregivers

variables	**category**	**Frequency**	**Percent**	**Cumulative Percent**
Age	18-35	19	22.6	22.6
	35-60	55	65.5	88.1
	Above 60	10	11.9	100.0
Gender	Male	58	69.0	69.0
	Female	26	31.0	100.0
Expense	0-10K	73	86.9	88.1
	10-20K	10	11.9	100.0
Cause Of CKD	Hypertension	57	67.9	69.0
	Diabetes	4	4.8	73.8
	Iatrogenic	8	9.5	82.1
	Post Renal Cause	9	10.7	92.9
	Kidney Infection	3	3.6	96.4
	Congenital Cause	3	3.6	100.0
Duration Of Diagnosis	< 5 years	66	78.6	78.6
	> 5 Years	18	21.4	21.4
Frequency	1 per Week	3	3.6	3.6
	2 per week	73	86.9	86.9
	3 per week	8	9.5	9.5
Demographics of caregivers				
variables	category	Frequency	Percent	Cumulative Percent
age	18-35	48	57.8	57.8
	35-60	35	42.2	42.2
gender	Male	54	65.1	65.1
	Female	29	34.9	34.9
expenses	0-10K	67	80.7	80.7
	10-20K	16	19.3	19.3
Cause of CKD	Hypertension	54	65.1	65.1
	Diabetes	5	6.0	6.0
	Iatrogenic	9	10.8	10.8
	Post Renal Cause	11	13.3	13.3
	Kidney Infection	2	2.4	2.4
	Congenital Cause	2	2.4	2.4
Duration of Diagnosis	< 5 years	61	73.5	73.5
	> 5 Years	22	26.5	26.5
Frequency of dialysis	1 per Week	8	9.6	9.6
	2 per week	67	80.7	80.7
	3 per week	8	9.6	9.6

Table 2: Fatigue level between patients and caregivers

		Not at all tired	**A little bit tired**	**Somewhat tired**	**Moderately tired**	**Extremely tired**
Group	Patients	3 (1.8) %	8 (4.8) %	13 (7.8) %	21 (12.6) %	39 (23.4) %
	Caregivers	20 (12.0) %	17 (10.2) %	18 (10.8) %	11 (6.6) %	17 (10.2) %
Total		23 (13.8) %	25 (15.0) %	31 (18.6) %	32 (19.2) %	56 (33.5) %

Table 3: Effect on activity of patients and caregivers

		I can do everything, I normally do	**I can do almost everything I normally do**	**I can do some of the things I normally do**	**I do what I have to do**	**I can do very little**
Group	Patients	0	3 (1.8) %	7 (4.2) %	5 (3.0) %	69 (41.3) %
	Caregivers	22 (13.2) %	14 (8.4) %	15 (9.0) %	12 (7.2) %	20 (12.0) %
Total		23 (13.8) %	17 (10.2) %	22 (13.2) %	17 (10.2) %	89 (53.3) %

Table 4: Social support among patients and caregivers

Scale of Perceived Social Support				
		1-2.9 (Low support)	3-5 (Moderate Support)	5.1-7 (High Support)
Group	Patients	14 (8.4) %	52 (31.1) %	18 (10.8) %
	Caregivers	11 (6.6) %	45 (26.9) %	27 (16.2) %
Total		25 (15.0) %	97 (58.1) %	45 (26.9) %

Table 5: Impact of Frequency of dialysis on mental health of patients

Variables	**X^2**	**df**	**P value**	**Phi value**	**Cramer's V**	**Exact Sig. (2-sided)**
Level of Fatigue	13.699^a	8	.090	.404	.286	0.11
Effect on activity	6.889^a	6	.331	.286	.203	0.29
Anxiety	3.737^a	4	.443	.211	.149	0.48
Depression	6.731^a	4	.151	.283	.200	0.14
Social Support	13.312^a	4	.010	.398	.281	0.015

Table 6: Impact of Duration of dialysis on mental health of patients

Variables	**X^2**	**df**	**P value**	**Phi value**	**Cramer's V**	**Exact Sig. (2-sided)**
Level of Fatigue	11.465^a	4	.022	.369	.369	0.024
Effect on activity	1.040^a	3	.791	.111	.111	0.88
Anxiety	$.660^a$	2	.719	.089	.089	0.79
Depression	3.033^a	2	.219	.190	.190	0.26
Social Support	$.009^a$	2	.995	.010	.010	1

Table 7: Anxiety and Depression Comparison

Variable	**Chi-square**	**df**	**p-value**	**Significance**
Anxiety Level	1.847	2	0.397	No
Depression Level	3.882	2	0.144	No

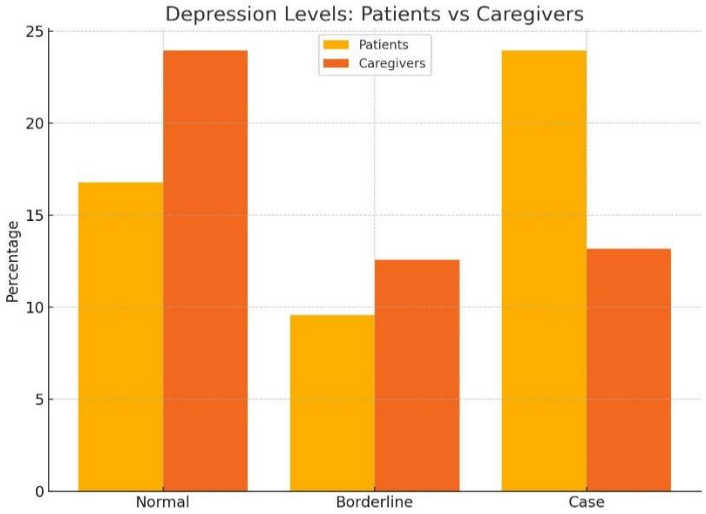

Figure 2 Depression Levels: Patients vs Caregivers

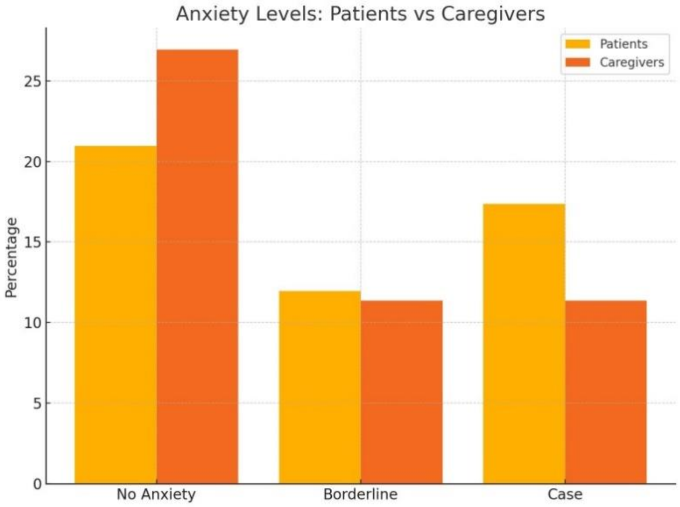

Figure 1 Anxiety Levels: Patients vs Caregivers

DISCUSSION

The present study highlighted the considerable psychological and physical burdens experienced by patients with chronic kidney disease undergoing dialysis and their caregivers. A notable proportion of patients reported experiencing anxiety (17.37%), depression (23.95%), and extreme fatigue (23.4%), while caregivers also showed elevated levels of anxiety (11.36%), depression (13.17%), and fatigue (10.2%). These findings align with existing literature demonstrating the toll of dialysis on both patients and their support systems. The chronic nature of dialysis, coupled with its disruptive routine, appeared to be closely linked with heightened fatigue levels, particularly among patients with longer durations on dialysis (10,11). When compared with international studies, distinct variations in the prevalence of psychological symptoms were observed. A study from Bangladesh reported substantially higher rates of depression (68.7%) and fatigue (51.6%) in hemodialysis patients, with slightly lower levels of anxiety (13.3%) than those found in the current study. These differences may stem from variations in study design, patient demographics, diagnostic tools, and contextual healthcare environments (12,13). Among caregivers, the observed fatigue and psychological symptoms were lower than those reported in a Greek study, where 88% experienced fatigue and 27.8% anxiety. Such discrepancies likely reflect differences in cultural expectations of caregiving, assessment methodologies, and healthcare infrastructure (14,15). A significant relationship was found between duration of dialysis and patient fatigue ($p = 0.022$), supporting prior evidence that prolonged exposure to dialysis contributes to worsening physical exhaustion. However, no significant associations were identified between dialysis duration and levels of anxiety, depression, or social support. This may indicate that while physical strain increases with time, psychological outcomes may be more influenced by individual coping mechanisms or external support systems.

The association between dialysis frequency and social support was statistically significant ($p = 0.010$), suggesting that patients receiving more frequent treatments may experience lower perceived social support. This contrasts with previous research showing no such association ($p = 0.140$), indicating that contextual or cultural variables may play a pivotal role in shaping social perceptions among dialysis patients (16,17). Notably, depression was not significantly associated with dialysis frequency ($p = 0.151$), diverging from findings of a tertiary care study in Karachi that reported a strong association ($p < 0.001$), possibly due to differences in study size, instruments, or analytical techniques (18). Anxiety also did not show a significant correlation with dialysis frequency ($p = 0.443$), a result that is consistent with findings from a study in Brazil where anxiety levels similarly lacked statistical association with dialysis exposure ($p = 0.991$) (19). This consistency suggests that anxiety may be more influenced by external psychosocial or individual factors rather than treatment-related variables. In contrast, a study from Egypt reported a significant link between fatigue and dialysis ($p = 0.012$), whereas this study did not observe such a correlation ($p = 0.090$), potentially due to differences in sample composition, duration of illness, or measurement strategies (20). The current study adds valuable insight by concurrently evaluating both patients and caregivers, shedding light on the often-overlooked psychological burden on informal care providers. However, the findings must be interpreted within the context of the study's limitations. The cross-sectional design precludes any causal inference, while the sample size and single center setting limit generalizability. Moreover, although validated tools were used to assess mental health, the complexity of psychological symptoms may not have been fully captured due to the use of screening instruments rather than diagnostic evaluations. Despite these limitations, the study contributes meaningfully to the growing body of evidence on the psychosocial challenges associated with CKD and dialysis. It underscores the need for holistic care approaches that incorporate mental health support for both patients and caregivers. Future research should adopt longitudinal designs to track psychological changes over time and explore the impact of structured psychosocial interventions. Additionally, multi-center studies with larger sample sizes and standardized diagnostic assessments would enhance the validity and applicability of findings across diverse populations.

CONCLUSION

This study concluded that patients with chronic kidney disease undergoing dialysis, along with their caregivers, commonly experience significant levels of fatigue, anxiety, and depression. These mental health challenges were more pronounced in those with longer durations of dialysis, highlighting the cumulative emotional and physical toll of chronic treatment. Importantly, individuals with stronger social support reported fewer psychological difficulties, underscoring the protective role of emotional and social networks. These findings emphasize the urgent need for targeted mental health interventions—particularly for those undergoing long-term dialysis—to enhance the overall quality of life and psychological well-being of both patients and their caregivers.

AUTHOR CONTRIBUTION

Author	Contribution
Syed Aamer Hussain	Substantial Contribution to study design, analysis, acquisition of Data Manuscript Writing Has given Final Approval of the version to be published
Bushra Zafar*	Substantial Contribution to study design, acquisition and interpretation of Data Critical Review and Manuscript Writing Has given Final Approval of the version to be published
Asad Zia Khan	Substantial Contribution to acquisition and interpretation of Data Has given Final Approval of the version to be published
Muqadas Tariq	Contributed to Data Collection and Analysis Has given Final Approval of the version to be published
Shahab Khan	Contributed to Data Collection and Analysis Has given Final Approval of the version to be published
Asfand Yar Ahmad	Substantial Contribution to study design and Data Analysis Has given Final Approval of the version to be published
Bibi Ayesha	Contributed to study concept and Data collection Has given Final Approval of the version to be published
Fatma Rashid	Writing - Review & Editing, Assistance with Data Curation
Bahar Ali	Writing - Review & Editing, Assistance with Data Curation
Aziz Ur Rehman	Writing - Review & Editing, Assistance with Data Curation

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