Original Article

DOI: 10.7860/JCDR/2026/85471.24025

Psychiatric Co-morbidities and Their Association with Quality of Life in Patients Undergoing Haemodialysis: A Cross-sectional Study

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ABSTRACT

Introduction: Haemodialysis, the primary treatment for End-Stage Renal Disease (ESRD), is essential for sustaining life but has significant negative impacts on patients' psychological and physical well-being. Psychiatric disorders, particularly depression and anxiety, are prevalent among these patients and severely affect their Quality of Life (QoL).

Aim: To evaluate the prevalence of psychiatric comorbidities, assess the quality of life, and examine their association with selected biochemical parameters among patients undergoing maintenance hemodialysis.

Materials and Methods: This hospital-based cross-sectional study was conducted at the haemodialysis unit of Kannur Medical College, Kannur, Kerala, India, from March 2017 to September 2018. A total of 45 patients aged 18 years and older undergoing maintenance haemodialysis for at least two months were included. Socio-demographic variables such as age, gender, marital status, education, occupation, and duration of dialysis were recorded. Psychiatric co-morbidities were assessed using the Mini International Neuropsychiatric Interview Plus (MINI PLUS) version 5.0.0, and QoL was evaluated using the World Health Organisation Quality of Life – Brief Version (WHOQoL-BREF) scale. Data were analysed using Statistical Package for Social Sciences (SPSS) version 21.0, with appropriate statistical tests applied; a p-value <0.05 was considered statistically significant.

Results: Among 45 patients (mean age: 59.07±9.69 years), psychiatric morbidity was present in 36 (80.0%). Major Depressive Episode (MDE) was most common in 24 patients (53.3%), followed by dysthymia in 6 patients (13.3%) and Generalised Anxiety Disorder (GAD) in 6 patients (13.3%); however, 9 patients (20.0%) had no psychiatric diagnosis. Psychiatric morbidity showed no significant association with age (p=0.928), gender (p=0.234), duration of dialysis (p=0.733), duration of renal disease (p=0.384), or Diabetes Mellitus (DM) (p=0.852). QoL scores were significantly lower in patients with psychiatric morbidity across all WHOQOL-BREF domains (all p<0.001). No significant association was observed between psychiatric morbidity and the biochemical parameters evaluated, including haemoglobin, blood urea, serum creatinine, sodium, potassium, calcium, and phosphorus levels (all p>0.05).

Conclusion: Psychiatric disorders such as depression and anxiety are prevalent among haemodialysis patients and are strongly linked to impaired QoL. Early screening and management of these conditions could enhance patient well-being. Further studies should explore the psychological dynamics in haemodialysis patients and develop tailored interventions to improve coping strategies and QoL.

Keywords: Anxiety disorders, Depression, End-stage renal disease, Mental health, Psychological stress

INTRODUCTION

Haemodialysis is the cornerstone of treatment for ESRD. However, it has been observed to adversely impact patients' QoL as well as their psychological and physical well-being. ESRD is an advanced stage of Chronic Kidney Disease (CKD) characterised by a progressive decline in renal function, leading to the accumulation of toxins, fluids, and electrolytes that are typically excreted by healthy kidneys, culminating in uraemic syndrome. This condition profoundly affects various aspects of a patient's life, including physiological, psychological, and socioeconomic domains, imposing significant challenges on the individual, their family, and the wider community. Despite its necessity, ESRD remains a condition requiring either maintenance dialysis or kidney transplantation to sustain life, as there is no inherent improvement in renal function without intervention [1]. Haemodialysis is a medical procedure designed to artificially filter the blood, removing toxins and excess fluids. Each session typically lasts 3-4 hours and is usually conducted three times per week. The reliance on these sessions for survival can be a significant source of psychological distress for patients. This sense of dependence on a machine, combined with the burdens of their condition, often acts as a profound stressor.

Patients undergoing haemodialysis frequently endure a range of physical and psychological challenges, which can lead to the development or exacerbation of psychiatric disorders such as depression and anxiety, further diminishing their QoL [2,3]. In addition to managing the symptoms and complications of their underlying illness, these individuals face the demands of a complex treatment regimen, including medications like multivitamins, phosphate binders, calcium and iron supplements, and erythropoietin injections. This regimen imposes strict lifestyle restrictions, forced periods of immobilisation during treatment, and side effects from medications. Even with diligent adherence to these therapies, many patients struggle to achieve a QoL that feels meaningful or fulfilling [1,4]. Patients on haemodialysis often experience significant sleep disturbances, which are linked to prolonged dialysis therapy, elevated urea or creatinine levels, chronic pain, disabilities, bone pain, and pruritus. These issues severely disrupt their already compromised QoL. Compounding this is the financial strain, especially in countries like India, where government-provided health benefits such as community insurance or social security are absent, leaving patients and families to shoulder the staggering costs.

Depression is the most prevalent psychiatric condition among chronic renal failure patients undergoing maintenance haemodialysis.

Its impact is profound, contributing to increased morbidity and mortality, with suicide being the most alarming consequence. These psychiatric illnesses, combined with social and psychological stressors, deeply erode the overall QoL for these patients.

A study highlighted the prevalence of CKD in central India, estimating it at 0.79% to 1.4%, with an incidence of ESRD at 181 per million population in 2005 [5]. These numbers reflect an urgent need for systemic changes to address not only the clinical but also the mental and social challenges faced by patients in under-resourced settings. Without intervention, the cycle of suffering caused by CKD and its treatment remains unbroken [5]. According to Modi GK and Jha V, the crude and age-adjusted incidence rates of ESRD in India were reported as 150 per million population in 2002, 143 in 2003, 149 in 2004, and 163 in 2005 [6]. Given India's population of approximately 125 crore, these figures highlight a substantial burden of CKD in the country [6].

Patients undergoing long-term haemodialysis experience substantial psychological, physical, emotional, and financial stress. The constant awareness of dependence on artificial life support often engenders feelings of fear, helplessness, and disability. In recent years, haemodialysis services have been extended to many district hospitals through state government initiatives, in addition to their availability in major government and private hospitals in urban centres and metropolitan cities. These developments underscore the importance of addressing psychiatric morbidity in patients with End-Stage Renal Disease (ESRD) undergoing haemodialysis. Psychiatric co-morbidities, often masked by non specific symptoms, can significantly affect treatment outcomes. Biochemical abnormalities such as anaemia, electrolyte imbalances, and uraemia may contribute to psychiatric symptoms among haemodialysis patients; therefore, their association with psychiatric morbidity was also examined.

A holistic approach to the assessment and management of these patients is critical for improving their prognosis and QoL. Hence, the present study was undertaken to explore these challenges and provide insights into the psychiatric dimensions of care for ESRD patients. Therefore, the present study aimed to assess the prevalence of psychiatric comorbidities, evaluate the quality of life, and examine the association between psychiatric comorbidities and selected biochemical parameters among patients undergoing maintenance haemodialysis. The objectives of the study are to evaluate the association between psychiatric comorbidities and selected biochemical parameters in patients undergoing haemodialysis.

MATERIALS AND METHODS

This hospital-based cross-sectional analytical study was conducted at the haemodialysis unit of Kannur Medical College, Kannur, Kerala, India, over a period of 1.5 years, from March 2017 to September 2018. Ethical clearance was obtained from the Institutional Ethics Committee (IEC approval number: KMC/PO/Ethics Cert/CrS-17-03-07). Written informed consent was obtained from all participants before inclusion in the study.

Sample size calculation: The minimum sample size was calculated as 41 by using the convenience sample method. The sample size was calculated using the formula for estimation of proportion in a cross-sectional study,

$$n = \frac{4pq}{d^2}, \text{ where}$$

p represents the prevalence from a previous study, q = 100-p, and d denotes the absolute precision.

Based on a prior Indian study by Jadhav BS et al., the prevalence of psychiatric co-morbidities among patients undergoing haemodialysis was reported as 64% [7]. Accordingly, p was taken as 64, q as 36, and the absolute precision (d) was set at 15. Substituting these values into the formula, the calculated sample size was

$$n = \frac{4\times64\times36}{15^2} = \frac{9216}{225} = 40.96,$$

which was rounded off to 41.

Therefore, the minimum required sample size was 41. A total of 45 participants were enrolled using consecutive sampling.

Inclusion criteria: Patients with previously undiagnosed psychiatric symptoms were considered as part of the study. Adult patients aged 18 years and above, undergoing maintenance haemodialysis for at least two months (twice weekly), who were available at the time of the study and who provided written informed consent were included in the study.

Exclusion criteria: Patients with severe cognitive dysfunction impairing assessment, those with recent bereavement within the past six months, and patients who were acutely medically unstable at the time of assessment were excluded. Patients with a documented past psychiatric illness requiring ongoing intensive psychiatric care were excluded to avoid diagnostic overlap.

Study Procedure

Eligible participants were recruited consecutively from the haemodialysis unit. Socio-demographic details, clinical history, duration of renal disease, duration of dialysis, co-morbid medical conditions, and relevant laboratory parameters were collected using a structured proforma.

Psychiatric co-morbidities were assessed using the Mini International Neuropsychiatric Interview Plus (MINI PLUS) Version 5.0.0 [8], a validated, brief structured diagnostic interview used for identifying major psychiatric disorders based on the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (DSM-IV) and the International Classification of Diseases, Tenth Revision (ICD-10) diagnostic criteria [9,10]. The MINI PLUS was administered by a trained psychiatrist. The instrument was used strictly for academic research purposes in a clinical setting. MINI-PLUS consists of multiple diagnostic modules, each corresponding to a specific psychiatric disorder. Each module begins with screening questions addressing the core diagnostic criteria, followed by additional questions as required. All items are scored in a dichotomous format (Yes/No). At the end of each module, diagnostic decisions are made based on the fulfilment of the specified criteria. Symptoms attributable to organic causes or substance use are excluded from diagnosis, and corresponding probes are incorporated within the instrument. Psychiatric morbidity was therefore treated as a categorical variable and analysed accordingly [8].

The QoL was assessed using the World Health Organisation QoL-BREF (WHOQOL-BREF) scale, which evaluates QoL across four domains: physical health, psychological health, social relationships, and environmental health. Each domain score was calculated according to WHO guidelines and transformed into a 0-100 scale, with higher scores indicating better QoL [11]. The WHOQOL-BREF scale demonstrated acceptable internal consistency in the present study, with a Cronbach's alpha of 0.731.

Socio-economic status was assessed using the Modified Kuppuswamy Scale, which classifies individuals into five socioeconomic categories based on education, occupation, and monthly income [12].

STATISTICAL ANALYSIS

Data were analysed using SPSS software version 21.0, and graphs were depicted using Microsoft Office. Continuous variables were summarised as Mean±Standard deviation and median with Interquartile Range (IQR). To compare the means of independent samples, an Independent sample t-test was used, or the alternative non parametric test, the Mann-Whitney U test was used. Categorical variable was summarised in terms of frequency with percentages and was tested using Chi-square/Fisher's exact test. For all test p-value <0.05 was considered statistically significant. Given the exploratory nature and limited sample size, multivariate analysis was not performed.

RESULTS

The present study included a total of 45 patients who fulfilled the inclusion criteria, with a mean age of 59.07±9.69 years [Table/Fig-1]. The majority of the study participants were hospitalised four times, 11 (24.4%). All participants were hospitalised at least once and a maximum of 16 times in the duration of renal manifestation, with mean number of hospitalisation was 4.6±2.8 [Table/Fig-2].

The mean age among those who have psychiatric morbidity is 59±9.75 years, and that of those who do not have psychiatric morbidity is almost the same. And there is no significant difference in age between the two groups (p-value=0.928). Psychiatric morbidity was present in 93.3% (14 out of 15) of female participants and was observed in 73.3% (22 out of 30) of male participants. However, there was no significant association between gender and psychiatric morbidities (p-value=0.234) [Table/Fig-3].

Parameters		n (%)
Age (in years) (Mean±SD)	59.07±9.69	
Gender	Male	30 (66.7)
	Female	15 (33.3)
Education	Primary	9 (20.0)
	Middle school	6 (13.3)
	High school	7 (15.6)
	Intermediate/diploma	11 (24.4)
	Graduate/postgraduate	9 (20.0)
	Professional/honours	3 (6.7)
Occupation	Unemployed	7 (15.6)
	Unskilled worker	8 (17.8)
	Semi-skilled worker	5 (11.1)
	Skilled worker	5 (11.1)
	Clerical, farmer	7 (15.6)
	Semi profession	7 (15.6)
	Profession	6 (13.3)
Monthly income	≤1802	7 (15.6)
	1803-5386	13 (28.9)
	5387-8988	12 (26.7)
	8989-13494	6 (13.3)
	13495-17999	4 (8.9)
	18000-36016	3 (6.7)
Socio-economic status	Upper	3 (6.7)
	Upper middle	6 (13.3)
	Lower middle	13 (28.9)
	Upper lower	22 (48.9)
	Lower	1 (2.2)
Marital status	Married	42 (93.3)
	Unmarried	3 (6.7)
Diabetes Mellitus (DM)	Present	36 (80)
	Absent	9 (20)
Hypertension	Present	45 (100)
Psychiatric morbidity	Major Depressive Episodes (MDE)	24 (53.3)
	Dysthymia	6 (13.3)
	Generalised Anxiety Disorder (GAD)	6 (13.3)
	Nil	9 (20.0)
Other medical co-morbidities	Present	8 (17.8)
	Absent	37 (82.2)

[Table/Fig-1]: Socio-demographic and clinical characteristics of the study participants (N=45).
* Data are presented as frequency and percentage. No inferential statistical test was applied

The mean haemoglobin level of 8.12±1.8 g/dL indicates a high prevalence of anaemia, which is a common complication in patients with ESRD undergoing maintenance haemodialysis. Elevated mean blood urea (100.2±26.3 mg/dL) and serum creatinine levels (7.65±2.57 mg/dL) reflect inadequate renal clearance consistent with advanced renal failure. Mean serum potassium levels (5.13±1.16 mEq/L) were marginally elevated, suggesting a tendency toward hyperkalemia, while serum calcium levels (7.5±1.24 mg/dL) were reduced, indicating disturbances in mineral metabolism commonly seen in CKD. Serum sodium levels were within the near-normal range [Table/Fig-4].

Parameters	Duration/Statistic	n (%) / Mean±SD
Renal disease (in years)	Mean±SD	2.73±1.39
	1	6 (13.3)
	2	17 (37.8)
	3	12 (26.7)
	4	5 (11.1)
	5	4 (8.9)
	6	-
	7	1 (2.2)
Dialysis (in years)	Mean±SD	2.20±1.22
	1	15 (33.3)
	2	15 (33.3)
	3	10 (22.2)
	4	2 (4.4)
	5	2 (4.4)
	6	1 (2.2)
Number of hospitalisations	Mean ± SD	4.60 ± 2.80

[Table/Fig-2]: Distribution of renal disease-related clinical characteristics among the study participants (N=45).
*Data are presented as Mean±Standard Deviation (SD)

Parameters	Category	n (%) / Mean±SD	p value
Age (years)	Mean±SD	59.07±9.69	0.928*
Gender	Male	30 (66.7)	0.234**
	Female	15 (33.3)	
Marital status	Married	42 (93.3)	1.000**
	Unmarried	3 (6.7)	
Diabetes Mellitus (DM)	Present	36 (80.0)	0.852**
	Absent	9 (20.0)	

[Table/Fig-3]: Association of Sociodemographic and Clinical Characteristics with Psychiatric Comorbidities (N=45)
*Independent sample t-test.
**Chi-square test/Fisher's exact test.

The mean WHOQOL-BREF domain scores among patients undergoing haemodialysis showed overall reduced QoL across all domains. The physical health domain had a mean score of 35.42±12.19, while the psychological health domain demonstrated a lower mean score of 29.02±11.21. The social relationship domain showed the lowest mean score of 21.87±18.16, whereas the environmental domain recorded the highest mean score of 37.78±10.27 among the four domains [Table/Fig-5].

Parameters	Mean±SD
Haemoglobin (g/dL)	8.12±1.8
Blood urea (mg/dL)	100.2±26.3
S. Creatinine (mg/dL)	7.65±2.57
S. Sodium (mEq/L)	138.7±6.01
S. Potassium (mEq/L)	5.13±1.16
S. Calcium (mg/dL)	7.5±1.24
S. Phosphorous (mg/dL)	3.87±1.0

[Table/Fig-4]: Mean and standard deviation of blood parameters in the study population.
*Data are presented as Mean±Standard Deviation (SD)

WHOQOL-BREF domain	Score Mean±SD
Physical health domain	35.42±12.19
Psychological health domain	29.02±11.21
Social relationship domain	21.87±18.16
Environmental domain	37.78±10.27

[Table/Fig-5]: Distribution of WHOQOL-BREF domain scores among the study population (N=45).
*Data are presented as Mean±Standard Deviation (SD). WHOQOL-BREF: World Health Organisation Quality of Life - Brief Version

There is no statistically significant association between diabetes and psychiatric morbidity (p-value=0.852). Among participants with psychiatric morbidity, 80.6% had diabetes, compared with 77.8% among those without psychiatric morbidity but with a history of diabetes. However, this difference in proportion was not statistically significant. The majority of the study participants were married. 91.7% in the psychiatric morbidity group and 100% in the non psychiatric morbidity group. This difference was also not statistically significantly (p=1.000) [Table/Fig-6].

Parameters	Psychiatric morbidity		Mann-Whitney U value	p-value
	Present	Absent		
	Mean±SD	Mean±SD		
Duration of renal disease (in years)	2.81±1.31	2.44±1.33	132	0.384
Duration of dialysis (in years)	2.22±1.22	2.11±1.27	150	0.733
Number of hospitalizations (frequency)	4.61±2.93	4.78±2.28	147	0.666
Physical health domain score (WHOQOL-BREF)	30.39±7.18	55.56±4.66	0.0	<0.001*
Psychological domain score (WHOQOL-BREF)	24.67±6.30	46.44±9.54	12.5	<0.001*
Environmental domain score (WHOQOL-BREF)	34.19±7.47	52.11±6.84	0.0	<0.001*
Social relationship score (WHOQOL-BREF)	15.28±12.36	48.22±12.98	11.0	<0.001*
Haemoglobin (g/dL)	7.91±1.75	8.99±1.77	107	0.118
Blood urea (mg/dL)	102.0±26.10	92.30±27.10	126	0.307
S. Creatinine(mg/dL)	7.81±2.73	7.03±1.76	143	0.590
S. Potassium (mEq/L)	5.19±1.22	4.91±0.90	142	0.579
S. Sodium (mEq/L)	139.0±6.29	140.0±5.00	148	0.701
S. Calcium (mg/dL)	7.42±1.21	7.78±1.41	152	0.776
Phosphorus (mg/dL)	3.70±0.73	4.48±1.62	107	0.140

[Table/Fig-6]: Association of clinical characteristics, biochemical parameters, and quality-of-life domain scores with psychiatric morbidity (N=45).
*Continuous variables compared using the Mann-Whitney U test. SD: Standard deviation

DISCUSSION

The current study reports an overall prevalence of psychiatric co-morbidities among patients on haemodialysis of 36 (80%). Among these, MDE was identified in 24 cases (53.33%), dysthymia in 6 cases (13.33%), and GAD in 6 cases (13.33%). The prevalence of MDE specifically, at 24 (53.33%), aligns closely with findings from previous research. For instance, Rai M et al., (47.8%), Bossola M et al., (52.5%), Kao TW et al., (60.5%), and Montinaro V et al., (50%) reported similar rates of depression among haemodialysis patients [13-16]. Conversely, studies such as those by Saeed Z et al., (70%) and Pramiladevi R et al., (72.7%) documented a significantly higher prevalence of depression [17,18], while Watnick S et al., (30%) Amira O (23.7%), and Aghanwa HS and Morakinyo O (25%) observed notably lower rates [19-21]. These variations in prevalence may reflect differences in healthcare quality, social support systems, and cultural contexts across regions. Notably, Rai M et al., study, conducted in an Indian population, found a prevalence of 47.8% for depression in haemodialysis patients [13], closely aligning with the current study's findings. These similarities highlight the consistent psychological burden faced by individuals undergoing haemodialysis, particularly within the Indian healthcare context.

In the present study, GAD was identified in 6 participants (13.33%), highlighting anxiety as a prevalent psychological condition among haemodialysis patients. Comparable findings were reported by Reckert A et al., who observed GAD in 17% of a sample of 52 haemodialysis patients [22]. Additionally, Cukor D et al., employed Structured Clinical Interviews (SCID) rather than self-assessment scales, revealing that 27% of study participants exhibited some form of anxiety disorder, including panic disorder (with or without agoraphobia), Post-Traumatic Stress Disorder (PTSD), social phobia, obsessive-compulsive disorder, or GAD [23]. These results emphasise the substantial burden of anxiety among individuals undergoing haemodialysis. Dysthymia was also observed in 6 participants 13.33% in the current study. A study by Cukor D et al., evaluating depression and anxiety in haemodialysis patients, reported that 29% of their sample of 70 patients with ESRD had a current depressive disorder. Of these, 20% were diagnosed with major depression, while 9% had dysthymia or depression not otherwise specified [23].

Another study by Endreddy A et al., identified psychiatric co-morbidities in 80% of patients undergoing haemodialysis. Major depressive disorder was the most prevalent, affecting 54% of patients, followed by dysthymia in 14% and GAD in 12%. Additionally, 80% of the patients had a history of diabetes, while hypertension was present in all participants [24]. These findings underscore the significant prevalence of both depressive and anxiety disorders in the haemodialysis population, emphasising the need for comprehensive psychological assessment and intervention.

The average age of the study participants was found to be relatively high at 59.07±9.69 years, reflecting the general trend of ESRD being more prevalent in older populations. Notably, the average age was comparable between participants with psychiatric co-morbidities and those without, indicating that age does not appear to influence the development of psychiatric morbidity in this population. Consistent with these findings, studies by Taskapan H et al., and Kutner NG also reported no significant relationship between age and psychiatric morbidity among ESRD patients undergoing haemodialysis [25,26]. Shanmukham B et al. reported a mean participant age of 52 years, with males constituting 75% of the study population [2].

The study sample comprised a greater number of male participants (n=30) compared to females (n=15). This male predominance aligns with findings from previous research by Pramiladevi R et al., and Anees M et al., which similarly reported a higher proportion of males among their study populations [18,27].

Regarding the duration of dialysis, the study found no association between the length of time on haemodialysis and the prevalence of psychiatric comorbidities, as the average duration of dialysis was nearly identical in both groups. This is consistent with earlier studies by Cukor D et al., (2007), Taskapan H et al., and Koo JR et al., which similarly reported no significant relationship between the duration of dialysis and psychiatric morbidity [23,26,28]. These findings suggest that neither age nor dialysis duration significantly impacts the risk of psychiatric conditions in this patient population.

In the present study, 36 (80%) of the participants had a history of DM. Among the psychiatric morbidity group, the prevalence of DM was 80.6%, while it was 77.8% in the non psychiatric morbidity group. Although the prevalence of diabetes was slightly higher in the psychiatric

morbidity group, the difference was not statistically significant. The Textbook of Medicine reports that depression occurs in 8% to 27% of diabetic cases. The higher prevalence of diabetes in the present study population may be attributed to the dual burden of ESRD and DM, which likely contributes to an increased risk of psychiatric morbidity. Supporting this, Jha V identified diabetic nephropathy as the most common cause of CKD in India [29]. Similarly, Gupta R highlighted the global significance of CKD, driven by the rising prevalence of diabetes and hypertension, both of which are associated with increased psychiatric morbidity and CKD [30]. However, the present study does not demonstrate a statistically significant relationship between these factors and psychiatric morbidity. Consistent with the present study findings, Koo JR et al., reported higher Beck Depression Inventory (BDI) scores in diabetic patients undergoing haemodialysis [28]. Additionally, a study by Araujo SMHA et al., found that out of 400 participants, 68 had depression, of whom 28 were diabetic [31]. These studies collectively suggest a complex interplay between DM, CKD, and psychiatric conditions, although further research is needed to establish definitive conclusions.

In the present study, the majority of participants, 42 (93.3%) were married, with 33 (78.6%) of this group experiencing psychiatric morbidity. Due to the small number of participants in other marital status categories, further analysis was not feasible. It is plausible that spousal support provides some protection against psychiatric disorders. However, marital responsibilities may also act as additional stressors, potentially exacerbating psychiatric issues.

Quality of life (QoL) is an important outcome measure for patients with chronic illnesses such as ESRD. The present study findings reveal that the QOL of patients undergoing haemodialysis was overall reduced, with all four domains of the WHOQoL-BREF scale-physical health, psychological health, environmental factors, and social relationships significantly associated with psychiatric morbidity. Patients with psychiatric conditions reported lower scores across these domains, indicating a profound impact on their overall QOL. These results align with the study by Kao et al., who used the WHOQOL-BREF scale for ESRD patients on hemodialysis. Their study concluded that lower scores in the physical and psychological domains, as well as overall QOL scores, were significantly correlated with an increased risk of mortality. Kao emphasized that QOL is an independent predictor of survival in this population [15]. As some aspects of QoL were assessed using single-item questions in this study, more comprehensive investigations are needed in the future to validate these findings and provide a deeper understanding of the interplay between psychiatric morbidity and QoL in haemodialysis patients. Similarly, another study by Shanmukham B et al., documented that 41% of participants screened positive for borderline clinical depression or higher severity levels, with a mean BDI score of 17.07. A significant association was observed between the frequency of haemodialysis sessions per week and depression, with an odds ratio of 4.16 (95% CI: 1.4-12.38) [2]. A significant correlation was identified between psychiatric co-morbidities and scores across all four domains of the WHOQoL-BREF score, highlighting the profound impact of these conditions on patients' overall QoL in the study by Endreddy A et al., [24]. Another study by Elhadad AA et al., ESRD patients with depression exhibited reduced scores across all domains of QoL compared to those without depression [32]. Additionally, a statistically significant association was observed between QoL and the presence of clinical illnesses such as diabetes or hypertension ($p<0.05$). Patients with these clinical conditions demonstrated lower QOL scores in all domains compared to those without such illnesses [32]. The high prevalence of psychiatric morbidity observed in the present study may be attributed to a combination of biological, psychological, and social factors associated with ESRD and long-term haemodialysis. Biological mechanisms such as uraemia, chronic inflammation, anaemia, electrolyte imbalances, and disturbances in calcium-phosphate metabolism have been implicated in the development of depressive and anxiety symptoms. Psychologically, the chronic nature of the illness, dependence on dialysis for survival, uncertainty regarding prognosis, and perceived loss of autonomy act as persistent stressors. Social factors, including unemployment, financial burden, role impairment, and reduced social support, further contribute to psychological distress in this population [23]. Potential confounding factors should be considered while interpreting the findings of the present study. Although medication effects, substance use, and sleep disturbances were not specifically assessed, commonly prescribed medications in CKD, such as corticosteroids and erythropoietin, as well as co-morbid medical conditions and chronic pain, may influence psychiatric symptoms. These factors may have contributed to the observed psychiatric morbidity and warrant consideration in future studies.

The findings of the present study have important implications for resource-limited settings, including many parts of India, where mental health services are often under-integrated into routine medical care. In such settings, psychiatric symptoms in patients undergoing haemodialysis may remain under-recognised due to time constraints, limited availability of mental health professionals, and stigma associated with mental illness [33].

The high prevalence of psychiatric morbidity observed highlights the need for routine mental health screening and integration of psychosocial interventions within haemodialysis services.

Limitation(s)

The present study employed a cross-sectional, hospital-based single-centre design with a relatively small sample size, which limits the ability to establish causal relationships and restricts the generalisability of the findings. The absence of a healthy control group further limits comparison with the general population. In addition, as an observational study, a detailed assessment of factors such as social support systems, treatment adherence, and functional ability across different treatment groups could not be undertaken. Future analytical studies with larger sample sizes and inclusion of control groups are warranted to address these limitations.

CONCLUSION(S)

The present study demonstrates a high prevalence of psychiatric morbidities, including MDE, Dysthymia, and GAD, among patients undergoing dialysis. These psychiatric conditions were associated with poorer QoL across all WHOQOL-BREF domains. No significant association was observed between psychiatric morbidity and the selected biochemical parameters evaluated in the study. This underscores the importance of systematically recognising and assessing mental health problems in this population. Although causal relationships cannot be inferred due to the cross-sectional design, the findings suggest that early identification and appropriate management of psychiatric symptoms, such as timely referral for psychiatric evaluation, psychosocial support, and basic counselling interventions, may help improve overall well-being.

Future research should include larger, analytically robust studies to further investigate the relationship between psychiatric morbidity and factors such as sociodemographic characteristics, personality traits, coping mechanisms, and treatment adherence. Comparative studies incorporating appropriate control groups may offer additional insights into the unique psychological challenges faced by patients undergoing long-term haemodialysis.

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PLAGIARISM CHECKING METHODS: [Jain H et al.]
- Plagiarism X-checker: Nov 25, 2025
- Manual Googling: Apr 14, 2026
- iThenticate Software: Apr 16, 2026 (10%)

ETYMOLOGY: Author Origin

EMENDATIONS: 8

AUTHOR DECLARATION:
- Financial or Other Competing Interests: None
- Was Ethics Committee Approval obtained for this study? Yes
- Was informed consent obtained from the subjects involved in the study? Yes
- For any images presented appropriate consent has been obtained from the subjects. Yes

Date of Submission: **Nov 20, 2025**
Date of Peer Review: **Jan 15, 2026**
Date of Acceptance: **Apr 18, 2026**
Date of Publishing: **Aug 01, 2026**