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Original Research Article

Depression in Patients With End-Stage Renal Disease Presenting to a Tertiary Care Hospital, Hyderabad

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Abstract: *The psychological disorders that are most prevalent in end-stage renal disease (ESRD) patients receiving hemodialysis are anxiety and depression. The prevalence of these disorders is affected by patient characteristics such as the burden of chronic illness, limitations in daily functioning, changes in body image, financial strain, and the emotional toll of managing a life-threatening condition.* ***Objective:*** *To evaluate the frequency of depression in patients with ESRD presenting to a tertiary care hospital.* ***Methodology:*** *A cross-sectional descriptive study conducted at the Nephrology Department, Liaquat University Hospital, Hyderabad, from 27th Feb to 26th May 2025. ESRD had been on hemodialysis two to three times a week for the past three months or longer; both males and females were included. Those who have had a prior history of depression before ESRD, experienced a recent loss of a close family member, or had undergone any recent significant adverse life events were excluded. The Hospital Anxiety and Depression Scale (HADS) was used to assess depression, and a score of 11 or above was classified as indicative of depression.* ***Result:*** *A total of 100 participants were included, with a mean age of 50.14 ± 11.23 years. The participant composition was 57% male and 43% female. Approximately 71% of participants had a dialysis duration of less than three months, while 29% had a duration of more than three months. The underlying causes of ESRD in the study population show 37 (37%) had an unknown cause, followed by 26 (26%) of participants had diabetes,17 (17%) had stone disease, 14 (14%) had hypertension, 5(5%) had polycystic kidney disease and 1 (1%) chronic glomerulonephritis (GN). Of the 100 participants, 59% were found to have depression, and the remaining 41% of participants did not.* ***Conclusion:*** *The study highlights a high prevalence of depression among individuals with ESRD, significantly exceeding that of the general population. Depression rates were unaffected by gender or socio-demographics, but were higher among patients who smoked.*

Keywords: Depression, End-Stage Renal Disease, Dialysis

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Introduction

End-stage renal disease (ESRD) patients often live with a complex combination of physical, emotional, and psychological pathologies stemming from the chronicity of the disease, frequent hospitalizations, and dependence on life-sustaining treatments. (1) Depression is the most common psychological disorder among ESRD patients undergoing hemodialysis (HD), with its prevalence varying based on patient characteristics. The increasing rate of depression among ESRD patients is one such serious issue, since it has a large impact on their overall prognosis, treatment compliance, and quality of life. (2)

Several factors, including the emotional toll of managing a life-threatening condition, changes in body image, restrictions in everyday functioning, the weight of chronic illness, and financial hardship, put these patients at a higher risk of developing depressive symptoms. (3) Additionally, the physiological changes associated with renal dysfunction, such as electrolyte imbalances, uremic toxins, and hormonal alterations, may also contribute to the emergence of depression. (4)

Studies report that the prevalence of anxiety in ESRD patients ranges from 12% to 52%, while depression affects approximately 23% to 42% of these patients. (5) Local research shows a broader range for depression among CKD patients, with reported frequencies varying between 32.2% and 80.2%. (6-8)

These variations highlight inconsistencies in the magnitude of depression across different studies. Therefore, the purpose of this study is to assess the burden of depression in ESRD patients by determining its frequency among those receiving care at a tertiary hospital.

Methodology

A descriptive cross-sectional design was conducted over three months, from February 27, 2025, to May 26, 2025, following approval from the research ethics committee of LUMHS, with approval number ERC No. LUMHS/REC/-654 dated February 26, 2025. Using a non-probability consecutive sampling technique, the sample was chosen.

The inclusion criteria encompassed individuals aged between 30 and 85 years, of either gender, with ESRD on hemodialysis two to three times a week for the past three months or longer. Patients were excluded if they had a prior history of depression before ESRD, experienced a recent loss of a close family member, or had undergone any recent significant adverse life events. The World Health Organization's sample size calculator was used to calculate the sample size. The study estimated a depression prevalence of 34.2% (9) in ESRD patients, with a confidence level of 95% and an absolute precision of 9%. This calculation resulted in a required sample size of 100 patients. Patients meeting the inclusion criteria were recruited from the outpatient department of the nephrology department at LUMHS. Informed written consent was obtained from each participant after a detailed explanation of the study. To ensure confidentiality, all participant information was securely handled. Data were gathered regarding the patients' age, gender, smoking status (Those who had smoked more than 100 cigarettes during their lifetime and were still smoking were classified as current smokers; those who had stopped smoking for six months or more were classified as ex-smokers; and those who had never smoked were classified as never smokers), and cause of chronic kidney disease. The Hospital Anxiety and Depression Scale

(HADS) was used to assess depression, and a score of 11 or above was classified as indicative of depression. All data, including demographic information and HADS scores, were recorded in a proforma.

Data were entered and analyzed using the Statistical Package for the Social Sciences (SPSS) version 24. Frequency and percentage were computed for the following variables: gender, smoking status, educational status, residential status, and depression. For the outcome variables, a Kolmogorov-Smirnov test was used to assess normality. As appropriate, means ± SD or Medians with IQR were calculated for age, family monthly income, duration of ESRD, and HADS score. The effect of stratified variables on HADS score was assessed using the chi-square test. Variables of interest that were stratified include: patient gender, smoking status, and Number of Dialysis sessions per week.

Results

The mean age of the participants was 50.14 ± 11.23 years, with an age range of 30 to 71 years. Table I presents the socio-demographic details of the study participants.

Table I: Socio-demographic and anthropometric details of study participants

	N	%
Gender		
• Male	57	57
• Female	43	43
Marital Status		
• Married	77	77
• Unmarried	23	23
Resident		
• Urban	41	41
• Rural	59	59
Educational Level		
• Illiterate	12	12
• Primary	24	24
• Secondary	29	29
• Intermediate	19	19
• Graduate	16	16
Occupational Status		
• Employed	29	29
• Unemployed	71	71
Smoking		
• Yes	32	32
• No	37	37
• Ex-smoker	31	31
Alcohol		
• Yes	4	4
• No	96	96

The median duration of ESRD in the study was 8 months, with an IQR of 8.75 months. Approximately 71% of participants had been undergoing dialysis for less than three months, while 29% had been undergoing dialysis for more than three months.

The underlying causes of ESRD in the study population were diverse, 37 (37%) had an unknown cause, 26 (26%) of participants had diabetes as the cause, 17 (17%) had stone disease, 14 (14%) had hypertension, 5(5%) had polycystic kidney disease and 1 (1%) had chronic glomerulonephritis (GN) as shown in Figure 1.

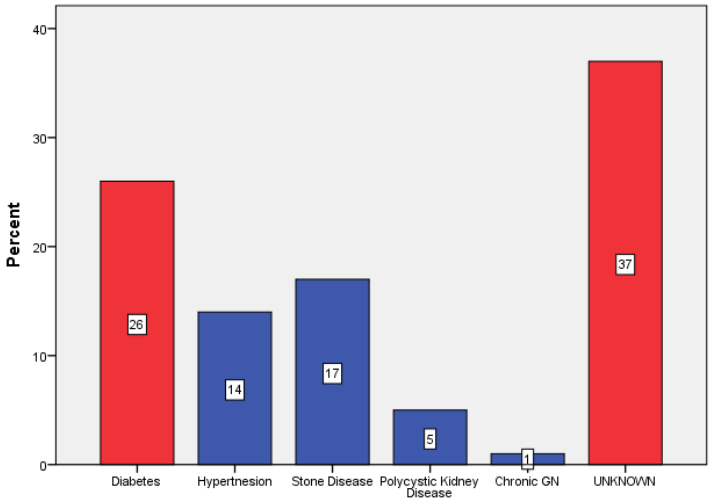

Figure I: Frequency of causes of End Stage Renal Disease

The prevalence of depression was assessed using the HAD scale. Of the 100 participants, 59% were found to have depression, as indicated by a score above the threshold for depression on the HAD scale. The remaining 41% of participants did not meet the criteria for depression. Of the 57 male participants, 34 (59%) were depressed, while 23 (41%) were not. Among the 43 female participants, 25 (58%) were depressed, and 18 (42%) were not. The chi-square test yielded a p-value of 0.879, indicating no significant difference in depression rates between males and females.

A significant association was found between the number of dialysis sessions and depression. Of the 71 patients undergoing dialysis for less than three sessions per week, 37 (52%) were depressed. In contrast, of the 29 patients undergoing dialysis for more than three sessions per week, 22 (76%) were depressed. The chi-square test returned a p-value of 0.028 as shown in Table 2.

Table II: Relationship of the number of dialysis sessions per week with depression

		Depression		Total
		Yes	No	
Session	<3	37	34	71
	>3	22	7	29
Total		59	41	100
P-Value		0.028		

There was a significant association between smoking and depression. Among the 32 smokers, 20 (63%) were depressed, while 12 (37%) were not. Among the 37 non-smokers, 27 (73%) were not depressed, and 10 (27%) were depressed. The chi-square test revealed a p-value of 0.015, suggesting that smokers were more likely to experience depression compared to non-smokers, as shown in Table 3.

Table III: Relationship of smoking with depression

		Depression		Total
		Yes	No	
Smoking	Yes	20	12	32
	No	27	10	37
	Ex	12	19	31
Total		59	41	100
P- Value		0.015		

No significant difference in depression prevalence was observed between married and unmarried individuals. Among the 77 married participants, 46 (60%) were depressed, and 31 (40%) were not. Among the 23 unmarried participants, 13 (56%) were depressed, and 10 (44%) were not. The chi-square test resulted in a p-value of 0.783, indicating no significant association between marital status and depression.

Discussion

Dialysis is one of the most important aspects of management for individuals with ESRD. However, it can significantly affect their mental and emotional health as well as their overall quality of life. Numerous studies have highlighted that patients undergoing dialysis often face a range of psychosocial challenges, such as depression, anxiety, stress, and feelings of social isolation. (10) These psychological difficulties may stem from several factors, including the chronic nature of their illness, the demanding nature of the treatment, lifestyle adjustments, and the uncertainty surrounding their long-term prognosis. (11)

Various methodologies have been employed to study depression among patients with ESRD, resulting in significant differences in the findings. For our study, we opted to use the widely recognized HAD questionnaire, which has been extensively utilized in numerous studies. (12-14) The findings of our study highlight a significant burden of depression among patients with ESRD. With 59% of participants being diagnosed with depression based on the HAD scale, this rate exceeds that observed in the general population, underscoring the psychological challenges faced by patients with ESRD, similar to what has been reported in various studies. (15-18)

The socio-demographic characteristics of the study population revealed that the majority of participants were male. Despite this, the rates of depression between males and females did not show any significant difference, as evidenced by the p-value of 0.879. These findings are in line with previous research, which has not consistently shown gender differences in the prevalence of depression among ESRD patients. (19) While some studies have reported higher depression rates in women, others have found no such disparity, suggesting that depression in ESRD may be influenced more by clinical factors than by gender. (20-21)

The results also showed that the duration and frequency of dialysis sessions were significant factors associated with depression. A higher proportion of patients undergoing more than three dialysis sessions per week were found to have depression (76%), compared to those undergoing fewer sessions (52%). This finding is consistent with the well-established relationship between dialysis frequency and the psychological burden experienced by patients. (22) Chronic and frequent dialysis may contribute to feelings of helplessness, fatigue, and social isolation, which are known risk factors for depression. (3)

Smoking was found to be significantly associated with depression. Among the smokers, 63% were depressed, compared to only 27% of non-smokers. This result mirrors previous studies indicating that smoking is not only a risk factor for physical health complications but also plays a role in the mental health of ESRD patients. (23) Smoking may contribute to depressive symptoms through its effects on the body's stress response system and by exacerbating the overall health status of patients. (24)

Study Limitations

The study has several limitations. Firstly, the cross-sectional design makes it difficult to determine causal relationships between depression and ESRD. Longitudinal studies would provide more insight into how

depression evolves throughout the course of ESRD treatment. The sample size of 100 participants may also limit the generalizability of the results. A larger, more diverse sample from multiple healthcare settings would enhance the validity of the findings. Additionally, the study participants were selected from a tertiary hospital, which could introduce selection bias, as patients at specialized centers may have multiple issues compared to those in regional dialysis centers. Another limitation arises from the absence of a control group, which makes it more difficult to interpret the results. Without comparing ESRD patients to healthy individuals or those with other chronic conditions, it is difficult to say if the high rates of depression are specifically linked to ESRD or just to having a chronic illness in general.

Interestingly, the underlying causes of ESRD in the study population were diverse, with a considerable proportion (37%) having an unknown cause. This finding suggests that the etiology of ESRD may not always be easily identified, highlighting the complexity of the disease. It also emphasizes the need for further research to explore the potential factors contributing to ESRD, especially those not related to common conditions such as diabetes or hypertension.

Conclusion

The results of this investigation emphasize the ample psychological weight borne by persons with ESRD, especially as it pertains to depression. An alarming number of individuals in this study showed signs of depressive symptoms according to the HADS, which places this population far above the level of the general population experiencing depression. The data showed that neither gender nor socio-demographic variables had any significant effect on the depression rates, but patients who smoke have high rates of depression. These findings highlight the urgent need for routine psychological evaluation and targeted mental health interventions, especially for ESRD patients, to improve overall treatment outcomes.

Declarations

Data Availability statement
All data generated or analysed during the study are included in the manuscript.

Ethics approval and consent to participate
Approved by the department concerned. (IRBEC24)

Consent for publication
Approved

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The authors declared the absence of a conflict of interest.

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All authors reviewed the results and approved the final version of the manuscript. They are also accountable for the integrity of the study.

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