



Research Article

A Study of Depression and The Quality of Life in Patients with Chronic Kidney Disease

Dr. Shamsheer Khan. P¹ Dr. Jayakrishna Murthy² Dr. S. S. Rama Kalyana Praveen^{3*} Vedanth Vasudevan⁴ Mohammed Saleem Yousuf⁵ Harshini Bethu⁶ Singamaneni Manideep⁷

¹Associate Professor, Department of General Medicine, Viswabharathi Medical College, Kurnool, Andhra Pradesh

² Assistant Professor, Department of Nephrology, Viswabharathi Medical College, Kurnool, Andhra Pradesh

^{3*} Assistant Professor, Department of General Medicine, Viswabharathi Medical College, Kurnool, Andhra Pradesh

^{4,5,6,7} Intern, Department of General Medicine, Viswabharathi Medical College, Kurnool, Andhra Pradesh

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ABSTRACT

Corresponding Author:

Dr. S. S. Rama Kalyana Praveen

Assistant Professor,
Department of General
Medicine,
Viswabharathi Medical College,
Kurnool, Andhra Pradesh
mail-id:

srkpraveen09@gmail.com

Received: 05-01-2026

Accepted: 17-02-2026

Published: 28-02-2026

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Medical and Pharmaceutical Research

Background: Chronic Kidney Disease (CKD) is a progressive disorder associated with significant physical, psychological, and social burden. Depression is common among CKD patients and negatively influences adherence, quality of life, and disease outcomes. However, limited data are available regarding depression among non-dialysis CKD patients in India.

Objectives: To determine the prevalence and severity of depression and to examine its association with CKD stage and comorbidities among patients with CKD stages 1–4.

Materials and Methods: This prospective observational cross-sectional study was conducted over 12 months at a tertiary care teaching hospital. A total of 100 patients aged ≥ 18 years with CKD stages 1–4 were included. Depression was screened using the Patient Health Questionnaire-9 (PHQ-9) and severity was assessed with the Montgomery–Åsberg Depression Rating Scale (MADRS). Health-related quality of life was assessed using the Kidney Disease Quality of Life (KDQOL) instrument. Statistical analysis was performed using appropriate tests, and $p < 0.05$ was considered statistically significant.

Results: Of the 100 participants, 52% were males and 48% were females. A majority of patients were in advanced stages of CKD, with 32% in Stage 3B and 35% in Stage 4. Overall, 49% of patients were found to have depression. The prevalence of depression increased progressively with CKD stage, from 14.3% in Stage 1 and 0% in Stage 2 to 25% in Stage 3A, 50% in Stage 3B, and 82.9% in Stage 4. Regarding severity, 21% had mild depression, 22% had moderate depression, and 6% had severe depression, while 51% had no depression. No statistically significant association was found between comorbidities (diabetes mellitus and hypertension) and severity of depression (Likelihood Ratio = 14.083, $p = 0.119$).

Conclusion: Depression is highly prevalent among non-dialysis CKD patients and increases significantly with advancing disease stage. Early psychological screening and timely intervention should be incorporated into routine CKD management to improve patient well-being and overall outcomes.

Keywords: Chronic Kidney Disease; Depression; Health-Related Quality of Life; PHQ-9; Non-dialysis CKD.

INTRODUCTION

Chronic Kidney Disease (CKD) is a long-standing disorder characterized by gradual and irreversible reduction in renal function. It is diagnosed when kidney damage or reduced glomerular filtration rate persists for more than three months. CKD has emerged as a significant contributor to global morbidity and mortality, affecting nearly 10–15% of the adult population worldwide.¹ The disease imposes not only a clinical burden but also substantial psychosocial and economic stress on patients and healthcare systems.

Progressive decline in kidney function leads to multiple systemic complications including anemia, hypertension, metabolic disturbances, cardiovascular disease, and eventually end-stage renal disease (ESRD).² While these physical consequences

are well recognized, the psychological dimensions of CKD have gained attention in recent years. The chronic and progressive nature of the illness, uncertainty about prognosis, financial strain, dietary restrictions, and fear of dependency often contribute to emotional disturbances in affected individuals.³

Among psychiatric comorbidities, depression is particularly common in patients with CKD. The reported prevalence varies widely depending on study population and assessment tools, but it is consistently higher than that observed in the general population.⁴ Depression in CKD patients has been linked to poor adherence to treatment, accelerated disease progression, increased hospitalization rates, and higher mortality.⁵ Despite these consequences, depressive symptoms frequently remain under-recognized, partly because somatic features of depression overlap with symptoms of kidney disease such as fatigue, sleep disturbance, and poor appetite.

In addition to psychological morbidity, CKD substantially affects Health-Related Quality of Life (HRQOL). HRQOL encompasses physical functioning, emotional well-being, social relationships, and overall perception of health. As kidney function declines, limitations in physical capacity, sexual dysfunction, sleep disturbances, reduced social interaction, and impaired occupational performance become increasingly evident.⁶ The coexistence of depression further worsens these domains, creating a compounded negative impact on patient well-being.

Assessment of HRQOL in CKD is commonly performed using disease-specific tools such as the Kidney Disease Quality of Life instrument, which evaluates physical, mental, and kidney disease-related domains. Screening and grading of depressive symptoms are facilitated by validated instruments including the Patient Health Questionnaire-9 and the Montgomery-Åsberg Depression Rating Scale. These standardized scales allow objective evaluation of psychological status in medical populations.

Although several international studies have explored depression and quality of life in patients undergoing dialysis, relatively fewer studies have focused on individuals in the earlier stages of CKD who are not receiving renal replacement therapy. In India, available data on depression and HRQOL among non-dialysis CKD patients remain limited. Sociocultural influences, healthcare accessibility, economic factors, and disease awareness may significantly influence psychological outcomes and perceived quality of life in this setting.⁷

Given the rising prevalence of CKD in India and the scarcity of regional data addressing its psychological dimensions, it is important to systematically evaluate depression and HRQOL in this population. Early detection of modifiable factors such as depression and anemia may provide opportunities for intervention and potentially improve overall outcomes. Therefore, the present study was undertaken to assess the prevalence and severity of depression and to examine its relationship with quality of life among patients with chronic kidney disease.

MATERIAL AND METHODS

Study Design

This study was designed as a prospective observational cross-sectional study.

Study Setting

The study was carried out at Viswabharathi Medical College, a tertiary care teaching hospital. Participants were recruited from the outpatient departments (OPD) of General Medicine and Nephrology.

Study Duration

The study was conducted for a period of **12 months**, from **January 2025 to January 2026**.

Study Population

The study population comprised patients diagnosed with Chronic Kidney Disease (CKD) stages 1 to 4 who attended the General Medicine and Nephrology OPDs during the study period.

Sample Size

A total of **100 patients** fulfilling the eligibility criteria were included in the study.

Inclusion Criteria

- Patients aged ≥ 18 years.
- Diagnosed cases of CKD stages 1 to 4 based on estimated glomerular filtration rate (eGFR) and clinical evaluation.
- Patients not undergoing dialysis treatment.
- Patients willing to provide informed written consent.

Exclusion Criteria

- Patients with CKD stage 5 or those receiving dialysis.
- Patients with previously diagnosed major psychiatric illness prior to CKD diagnosis.
- Critically ill patients unable to participate in interviews.

- Patients unwilling to provide consent.

Ethical Considerations

Approval for the study was obtained from the Institutional Ethics Committee prior to commencement. All participants were informed in detail about the purpose, procedures, confidentiality of data, and voluntary nature of participation. Written informed consent was obtained from all eligible patients before enrolment.

Study Procedure

All patients attending the General Medicine and Nephrology OPDs who were diagnosed with CKD stages 1–4 were screened for eligibility. Patients satisfying the inclusion criteria were approached, and the study was explained in their local language. After obtaining written informed consent, participants were enrolled.

A semi-structured data collection proforma was used to record:

- Socio-demographic details (age, gender, marital status, education, occupation, socioeconomic status).
- Clinical characteristics (stage of CKD, duration of illness, comorbid conditions such as diabetes mellitus and hypertension).
- Relevant laboratory parameters (hemoglobin levels, serum creatinine, eGFR).

Assessment of Depression

Depression was screened using the Patient Health Questionnaire-9. The PHQ-9 consists of nine items based on DSM criteria for major depressive disorder. Each item is scored from 0 (not at all) to 3 (nearly every day), giving a total score ranging from 0 to 27. A cut-off score of ≥ 10 was considered indicative of clinically significant depression.

The severity of depression was further assessed using the Montgomery–Åsberg Depression Rating Scale, which evaluates depressive symptom intensity. Scores were categorized into mild, moderate, and severe depression according to standard scoring guidelines.

Assessment of Quality of Life

Health-related quality of life was evaluated using the Kidney Disease Quality of Life instrument. This instrument assesses multiple domains including:

- Physical functioning
- Role limitations (physical and emotional)
- Pain
- Social functioning
- Emotional well-being
- Energy and fatigue
- Sleep
- Cognitive function
- Sexual function
- Overall health perception

Scores for each domain were calculated according to the scoring manual, with higher scores indicating better quality of life.

RESULTS

Among the 100 patients included in the study, 52% were males and 48% were females, showing a nearly equal gender distribution with a slight male predominance as shown in Table 1.

Table 1: Gender Distribution of CKD Patients (n = 100)

| Gender | Number of Patients | Percentage (%) |
|--------------|--------------------|----------------|
| Male | 52 | 52% |
| Female | 48 | 48% |
| Total | 100 | 100% |

The majority of patients belonged to **Stage 4 (35%)**, followed by **Stage 3B (32%)**, indicating that a large proportion of patients presented in advanced stages of CKD as shown in table 2

Table 2: Distribution of Patients According to CKD Stage

| CKD Stage | Number of Patients | Percentage (%) |
|-----------|--------------------|----------------|
| Stage 1 | 7 | 7% |
| Stage 2 | 14 | 14% |
| Stage 3A | 12 | 12% |

| CKD Stage | Number of Patients | Percentage (%) |
|-----------|--------------------|----------------|
| Stage 3B | 32 | 32% |
| Stage 4 | 35 | 35% |

Out of 100 patients with chronic kidney disease, **49% were found to have depression**, while **51% did not have depression**. This indicates that nearly half of the CKD patients in the study population experienced depressive symptoms as shown in Table 3

Table 3: Prevalence of Depression among CKD Patients (n = 100)

| Depression Status | Number of Patients | Percentage (%) |
|--------------------|--------------------|----------------|
| Depression Present | 49 | 49% |
| No Depression | 51 | 51% |
| Total | 100 | 100% |

The prevalence of depression increased progressively with advancing CKD stage. Depression prevalence was highest in **Stage 4 (82.9%)**, followed by **Stage 3B (50%)**, demonstrating a clear increase in depressive symptoms with worsening kidney function as shown in Table 4.

Table 4: Stage-wise Distribution of Depression

| CKD Stage | Total Patients | Depression Present | % Depressed |
|-----------|----------------|--------------------|-------------|
| Stage 1 | 7 | 1 | 14.3% |
| Stage 2 | 14 | 0 | 0% |
| Stage 3A | 12 | 3 | 25% |
| Stage 3B | 32 | 16 | 50% |
| Stage 4 | 35 | 29 | 82.9% |

Among depressed patients (n=49), Mild depression was seen in 21 patients, Moderate depression was seen in 22 patients and Severe depression was seen in 6 patients. Moderate depression constituted the largest proportion among depressed individuals as shown in Table 5.

Table 5: Severity of Depression

| Severity Score | Number of Patients | Percentage (%) |
|-------------------|--------------------|----------------|
| 0 (No depression) | 51 | 51% |
| 1 (Mild) | 21 | 21% |
| 2 (Moderate) | 22 | 22% |
| 3 (Severe) | 6 | 6% |

The association between comorbidities and severity of depression was assessed using the **Chi-square test of independence**. The Likelihood Ratio Chi-square value was 14.083 with a p-value of 0.119, indicating no statistically significant association ($p > 0.05$) as shown in Table 6.

Table 6: Association Between Comorbidities and Severity of Depression (n = 100)

| Comorbidity | No Depression | Mild | Moderate | Severe | Total |
|-----------------|---------------|-----------|-----------|----------|------------|
| No comorbidity | 21 | 9 | 3 | 1 | 34 |
| Type 2 Diabetes | 11 | 4 | 5 | 1 | 21 |
| Hypertension | 8 | 3 | 11 | 2 | 24 |
| Both DM + HTN | 11 | 5 | 3 | 2 | 21 |
| Total | 51 | 21 | 22 | 6 | 100 |

Likelihood Ratio = 14.083 p-value = 0.119

DISCUSSION

Chronic Kidney Disease (CKD) is increasingly recognized not only as a medical illness but also as a condition associated with substantial psychological morbidity. The present study evaluated depression and health-related quality of life

(HRQOL) among patients with CKD stages 1–4 who were not receiving dialysis. The findings provide important insights into the burden of depression in earlier stages of CKD within the Indian context.

In the present study, 49% of patients were found to have depression. This prevalence is considerably higher than that observed in the general population and is consistent with previous studies reporting depression rates ranging between 20% and 50% among CKD patients.^{8,9} The variability in prevalence across studies may be attributed to differences in study populations, stages of CKD included, assessment tools used, and cultural factors influencing the reporting of psychological symptoms. Nevertheless, the nearly half prevalence observed in our study underscores the significant psychological burden faced by CKD patients even before the initiation of dialysis.

A key observation in this study was the progressive increase in depression prevalence with advancing CKD stage. Depression was present in 14.3% of Stage 1 patients, rising sharply to 82.9% in Stage 4 patients. This stage-wise trend aligns with previous findings that worsening renal function is associated with greater psychological distress.¹⁰ As kidney function declines, patients experience increased physical limitations, dietary restrictions, medication burden, financial strain, and fear of progression to end-stage renal disease. These stressors likely contribute cumulatively to depressive symptomatology. Biological mechanisms such as chronic inflammation, uremic toxin accumulation, anemia, and neuroendocrine dysregulation may also play contributory roles in the pathogenesis of depression in advanced CKD.¹¹

With respect to severity, moderate depression constituted the largest proportion among affected individuals (22%), followed by mild (21%) and severe depression (6%). Similar patterns have been reported in earlier studies, where mild-to-moderate depression predominated over severe forms.¹² This distribution suggests that a substantial proportion of patients may benefit from early psychological screening and timely intervention before symptoms progress to severe depression. Early identification is particularly important because somatic symptoms of depression, such as fatigue and sleep disturbance, overlap significantly with CKD-related symptoms, leading to under-recognition in routine clinical practice.¹³

The present study did not find a statistically significant association between comorbidities (diabetes mellitus and hypertension) and severity of depression ($p = 0.119$). Although diabetes and hypertension are known contributors to CKD progression and may independently predispose to depression, the lack of statistical significance in our study could be due to the relatively small sample size. Some previous studies have reported an association between multiple comorbidities and higher depressive symptom burden, whereas others have shown inconsistent results.¹⁴ This indicates that factors beyond comorbid medical conditions—such as social support, coping mechanisms, socioeconomic status, and illness perception—may play a more substantial role in determining psychological outcomes.

The stage-wise distribution of patients in our study showed that a majority presented in Stage 3B and Stage 4 CKD (67% combined). This reflects late healthcare-seeking behavior and delayed diagnosis, a pattern commonly observed in developing countries including India.¹⁵ Late-stage presentation may itself contribute to higher depression prevalence due to increased symptom burden and awareness of disease severity.

CKD significantly affects multiple domains of HRQOL, including physical functioning, social interaction, emotional well-being, and overall health perception. Previous literature has consistently demonstrated that patients with advanced CKD report poorer HRQOL scores compared to those in early stages.¹⁶ Depression further compounds this impairment, as depressive symptoms are strongly correlated with reduced physical activity, decreased treatment adherence, and impaired social relationships.¹⁷ Although HRQOL domain-wise analysis is not detailed here, the high prevalence of depression observed in advanced CKD stages strongly suggests a negative impact on quality of life.

The findings of this study emphasize the importance of routine psychological screening in CKD patients, particularly those in advanced stages. Instruments such as the Patient Health Questionnaire-9 and Montgomery–Åsberg Depression Rating Scale are simple, validated tools that can be incorporated into outpatient settings. Early recognition and management of depression through counseling, cognitive behavioral therapy, and pharmacotherapy when indicated may improve treatment adherence, quality of life, and possibly clinical outcomes.¹⁸

CONCLUSION

This study shows that depression is highly prevalent among patients with Chronic Kidney Disease (CKD) stages 1–4, with 49% of patients exhibiting depressive symptoms. The prevalence of depression increased significantly with advancing CKD stage, being highest in Stage 4 patients. Moderate depression was the most common severity level observed. No statistically significant association was found between comorbidities and severity of depression. These findings highlight the substantial psychological burden associated with CKD even before dialysis initiation. Routine screening and early management of depression should be integrated into standard CKD care to improve overall patient outcomes and quality of life.

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