

Depression and Anxiety in Patients with Chronic Kidney Disease: Prevalence, Risk Factors and Impact on Quality of Life

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Abstract

Background: Chronic kidney disease (CKD) represents a significant challenge to public health, often accompanied by significant psychological distress, including depression and anxiety. These psychological disorders can negatively influence patients' quality of life (QoL) and adherence to treatment.

Objective: The present study sought to determine the prevalence of depression and anxiety in individuals with CKD, examine related risk factors and assess their effect on QoL.

Methods and Materials: A cross-sectional study was carried out at the Department of Nephrology in collaboration with the Department of Psychiatry at Community-Based Medical College, Bangladesh, between January 2023 and December 2024.

Results: A total of 83 CKD patients were recruited using purposive sampling. Data were collected through structured questionnaires, including validated scales for depression, anxiety and QoL assessment. Demographic, clinical and psychosocial factors were analyzed to determine their association with mental health outcomes. Data were analyzed using SPSS version 23.0, employing both descriptive and inferential statistical methods to examine the associations between variables. Among 83 CKD patients, depression prevalence was 38.6% and anxiety prevalence was 31.3%. Dialysis dependency (OR: 2.45 for depression, 2.12 for anxiety), low socioeconomic status (OR: 1.89 for depression, 1.76 for anxiety) and comorbidities were significant risk factors. Depression correlated with reduced physical health ($r=-0.52$) and emotional well-being ($r=-0.61$), while anxiety showed similar negative correlations ($r=-0.48$ and $r=-0.56$, respectively).

Conclusions: Depression and anxiety are common among individuals with CKD and substantially reduce their quality of life. Prompt screening and the incorporation of mental health interventions are crucial for alleviating psychological distress and enhancing patient outcomes. Future studies should prioritize longitudinal research and tailored strategies to lessen the mental health impact on this group.

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Introduction

Chronic kidney disease (CKD) poses a major worldwide health challenge, impacting more than 850 million individuals globally, with its occurrence expected to increase alongside rising rates of diabetes, hypertension and an aging population¹. CKD is a gradually advancing disorder that frequently progresses to end-stage renal disease (ESRD), requiring dialysis or kidney transplantation to sustain life². In addition to its physical effects, CKD is increasingly acknowledged for its significant psychological burden, with depression and anxiety ranking among the most common mental health issues in

affected individuals³. Depression and anxiety are widespread among CKD patients, with research considerably greater than those seen in the general population, highlighting the distinct psychological indicating that depression affects between 20.0% and 40.0% of patients, while anxiety impacts roughly 25.0% to 30.0% of this population^{4,5}. These figures are challenges experienced by individuals with CKD⁶. Depression and anxiety not only reduce patients' quality of life but also lead to adverse clinical outcomes, such as poor treatment adherence, faster disease progression and higher mortality rates^{7,8}. For instance, depressive symptoms

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have been linked to missed dialysis sessions and poor dietary compliance, while anxiety is associated with heightened perceptions of symptom severity and reduced engagement in self-care^{9,10}. The development of depression and anxiety in CKD patients is influenced by multiple factors, encompassing biological, psychological and social dimensions. Disease-specific elements, including advanced CKD stages, reliance on dialysis and coexisting conditions such as cardiovascular disease and diabetes, play a major role in triggering psychological distress¹¹. Additionally, psychosocial factors, including low socioeconomic status, limited social support and financial strain, further exacerbate mental health challenges in this population¹². The burden of managing a chronic illness, coupled with the demands of dialysis or transplantation, often leads to feelings of helplessness and hopelessness, which can precipitate or worsen mental health conditions¹³. Despite their high prevalence and harmful effects, depression and anxiety in CKD patients remain largely underdiagnosed and inadequately treated¹⁴. This care gap is particularly concerning, as accumulating evidence links untreated mental health disorders with worse clinical outcomes, including higher hospitalization rates and lower survival¹⁵. Quality of life (QoL), a multi-dimensional concept encompassing physical, emotional and social well-being, serves as a vital outcome measure in CKD patients, reflecting the overall impact of the disease and its treatment on daily life¹⁶. This study seeks to fill these gaps by evaluating the prevalence of depression and anxiety in CKD patients, identifying contributing risk factors and assessing their effects on QoL. By highlighting the psychological burden associated with CKD, the research aims to guide the development of targeted interventions that incorporate mental health care into standard CKD management, ultimately enhancing patient outcomes and quality of life.

Methods

This cross-sectional study was conducted in the Department of Nephrology in collaboration with the Department of Psychiatry outpatients in the Community-Based Medical College, Bangladesh, from January 2023 to December 2024. A total of 83 CKD patients were recruited using purposive sampling. Inclusion criteria included patients aged 18 years or older diagnosed with CKD stages 3-5,

including those on dialysis. Patients with severe cognitive impairment or acute psychiatric conditions were excluded. Data were collected through structured questionnaires, which included validated tools such as the Patient Health Questionnaire-9 (PHQ-9) for depression, the Generalized Anxiety Disorder-7 (GAD-7) scale for anxiety and the Kidney Disease Quality of Life-36 (KDQOL-36) for QoL assessment. Demographic, clinical and psychosocial data, including age, gender, socioeconomic status, comorbidities and dialysis dependency, were also recorded. Data analysis was performed using SPSS version 23.0. Descriptive statistics were used to summarize demographic and clinical characteristics. Prevalence rates of depression and anxiety were calculated and inferential statistics, including chi-square tests and logistic regression, were employed to identify risk factors associated with psychological distress. Pearson's correlation and multiple regression analyses were conducted to evaluate the impact of depression and anxiety on QoL. Ethical approval was obtained from the institutional review board and written informed consent was secured from all participants.

Results

The study enrolled 83 CKD patients, with a mean age of 52.4 ± 12.3 years. Of these, 54.2% were male and 45.8% were female. Most participants (62.7%) were undergoing dialysis, while 37.3% were in the pre-dialysis stage. Hypertension (73.5%) and diabetes (56.6%) were the most frequently reported comorbidities. The prevalence of depression and anxiety, assessed using the PHQ-9 and GAD-7 scales, was 38.6% and 31.3%, respectively. Dialysis dependency, low socioeconomic status and the presence of comorbidities emerged as significant risk factors. Patients receiving dialysis had 2.45 times higher odds of depression (95% CI: 1.32-4.56) and 2.12 times higher odds of anxiety (95% CI: 1.18-3.81). Similarly, low socioeconomic status increased the likelihood of depression (OR: 1.89, 95% CI: 1.05-3.41) and anxiety (OR: 1.76, 95% CI: 1.02-3.04). Comorbidities, especially diabetes and hypertension, also significantly contributed to psychological distress. Depression was strongly negatively correlated with physical health ($r = -0.52$, $p < 0.05$), emotional well-being ($r = -0.61$, $p < 0.05$) and social functioning ($r = -0.45$, $p < 0.05$).

Table I: Demographic characteristics of participants

Variable	Frequency (n)	Percentage (%)
Age (Mean±SD)		52.4±12.3
<i>Gender</i>		
Male	45	54.20
Female	38	45.80
<i>Education</i>		
Primary	25	30.10
Secondary	35	42.20
Graduate & above	23	27.70

Likewise, anxiety showed negative correlations with physical health ($r = -0.48$, $p < 0.05$), emotional well-being ($r = -0.56$, $p < 0.05$) and social functioning ($r = -0.41$, $p < 0.05$). These results

highlight the substantial adverse impact of psychological distress on multiple aspects of quality of life in CKD patients.

Table II: Clinical characteristics of participants

Variable	Number (n)	Percentage (%)
<i>CKD stages</i>		
CKD stage 3	22	26.50
CKD stage 4	28	33.70
CKD stage 5	33	39.80
Dialysis dependency	52	62.70
<i>Comorbidities</i>		
Diabetes	47	56.60
Hypertension	61	73.50

Table III: Risk factors for depression and anxiety

Factors	Depression (OR, 95% CI)	Anxiety (OR, 95% CI)
DD	2.45 (1.32-4.56)	2.12 (1.18-3.81)
LSS	1.89 (1.05-3.41)	1.76 (1.02-3.04)
PC	2.10 (1.20-3.68)	1.95 (1.10-3.45)

DD: Dialysis dependency, LSS: Low socioeconomic status, PC: Presence of comorbidities

Table IV: Correlation between depression and QoL domains

QoL Domain	Correlation (r)	p value
Physical health	-0.52	<0.05
Emotional well-being	-0.61	<0.05
Social functioning	-0.45	<0.05

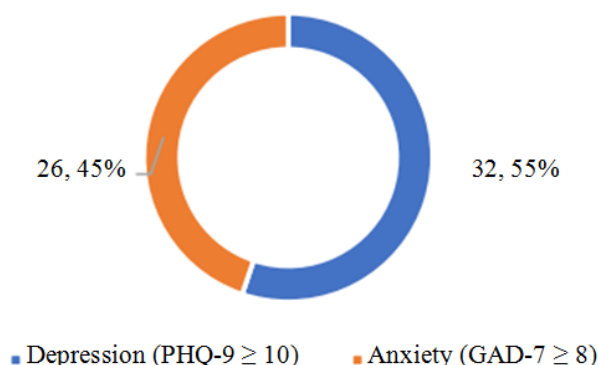


Figure 1: Prevalence of depression and anxiety

Table V: Correlation between anxiety and QoL domains

QoL Domain	Correlation (r)	p value
Physical health	-0.48	<0.05
Emotional well-being	-0.56	<0.05
Social functioning	-0.41	<0.05

Discussion

The results of this study indicate a high prevalence of depression (38.6%) and anxiety (31.3%) among CKD patients, in line with previous research demonstrating elevated psychological distress in this population¹⁷. These rates far exceed those observed in the general population, highlighting the distinct mental health challenges faced by individuals with CKD⁶. The findings are consistent with global evidence, including a meta-analysis by Palmer et al., which reported depression prevalence of up to 40.0% in CKD patients³. and a study by Webster et al., which found anxiety affecting roughly 30.0% of this group². Dialysis dependency was identified as a major risk factor for both depression and anxiety, with patients undergoing dialysis being 2.45 times more likely to experience depression and 2.12 times more likely to experience anxiety compared to those in the pre-dialysis stage. This finding is consistent with prior studies that have highlighted the psychological burden of dialysis, including its time-consuming nature, physical discomfort and impact on daily functioning^{18,19}. Additionally, low socioeconomic status and the presence of comorbidities, particularly diabetes and hypertension, were strongly associated with psychological distress. These findings are supported by Cohen et al., who identified socioeconomic challenges and comorbid conditions as key contributors to mental health

issues in CKD patients⁶. The negative impact of depression and anxiety on QoL was profound, with strong correlations observed across physical health, emotional well-being and social functioning domains. These results are consistent with studies by Perlman et al.²⁰ and Mujais et al.¹⁶, which demonstrated that psychological distress significantly impairs QoL in CKD patients. The physical health domain was particularly affected, likely due to the overlapping symptoms of CKD and mental health disorders, such as fatigue, sleep disturbances and reduced mobility. Emotional well-being was also severely impacted, reflecting the emotional toll of living with a chronic illness and the associated treatment burden. The findings of this study have important clinical implications. First, they highlight the need for routine screening for depression and anxiety in CKD patients, particularly those on dialysis or with low socioeconomic status. Early identification of psychological distress can facilitate timely interventions, potentially improving both mental health outcomes and QoL. Second, integrated care models that incorporate mental health services into CKD management should be prioritized. For example, collaborative care approaches involving nephrologists, psychologists and social workers have shown promise in addressing the complex needs of CKD patients²¹. Depression and anxiety are common among CKD patients and substantially

compromise their quality of life. Implementing early screening, integrated care approaches and targeted interventions is crucial for enhancing patient outcomes and overall well-being. However, this study's cross-sectional design limits the ability to infer causality. Additionally, the small sample size, single-center recruitment and reliance on self-reported measures may reduce generalizability and introduce bias. Future research should utilize longitudinal designs with larger and more diverse populations to confirm these findings and examine causal relationships.

Conclusion

Depression and anxiety are common in CKD patients, markedly impacting their quality of life, especially in physical and emotional aspects. Key risk factors include dialysis dependency, low socioeconomic status and comorbidities. Early screening and integrated mental health interventions are essential to address these challenges. Future studies should prioritize longitudinal research and the development of targeted interventions to reduce the psychological burden in this population.

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