

## **Study of Anxiety and Depression among Patients with Chronic Kidney Diseases Undergoing Dialysis in A Tertiary Care Hospital**

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### **Abstract**

**Background:** Chronic Kidney Disease (CKD) is considered as a public health problem worldwide. It is a state of progressive decay in kidney functionality which ultimately results in the need for renal replacement (dialysis or transplant). Among patients who are suffering from chronic kidney disease (CKD) and undergoing dialysis, the most common psychiatric conditions are anxiety and depression, which often go untreated, owing to the lack of knowledge and misperceptions about these condition.

**Methods:** The study was conducted at tertiary care hospital ASCOMS on 78 cases above 18 years of age. Data was collected by using clinician-administered tool, Hamilton Anxiety Rating Scale (HAM-A) and Hamilton Depression Rating Scale (HAM-D).

**Results:** In present study the majority of the studied cases were in the age group ranging from 46-55 years (24.36%) with mean age  $48.5 \pm 4.56$  years and male predominance (60.26 %). The prevalence of anxiety and

depression was 62.82% and 64.10%, respectively. The highest prevalence of Anxiety (24.36% of total patients) was observed in the 1-3-year chronic kidney disease duration group and Depression prevalence peaked in the 3-5-year group (23.08%). Regarding duration of dialysis, the highest prevalence of Anxiety occurs in patients undergoing dialysis for <1 year (35.9%, 28 cases) and the highest prevalence of depression was seen in <1-year group (26.92%, 21 cases).

**Conclusion:** Patients who are suffering from chronic kidney disease and undergoing dialysis have symptoms of anxiety and depression. Increased duration of chronic kidney disease and dialysis are likely to result in poor psychological health in these patients. Therefore, regular screening for depression and anxiety in chronic kidney disease (CKD) patients is crucial for early identification and intervention

**Keywords:** Anxiety; Depression; Chronic Kidney Diseases, Dialysis.

## **Introduction**

Chronic Kidney Disease (CKD) is considered as a public health problem worldwide<sup>1</sup>. It refers to a progressive decline in kidney function, indicated by a glomerular filtration rate of less than 60 ml/min/1.73 m<sup>2</sup> for a duration exceeding 3 months, regardless of the underlying cause<sup>2</sup>.

It is a state of progressive decay in kidney functionality which ultimately results in the need for renal replacement (dialysis or transplant). Kidney diseases occur when the kidneys are damaged and damage may be caused by diabetes, High Blood Pressure (HTN), and various other chronic (long-term) conditions.<sup>3</sup>

After months or years, Chronic Kidney Disease may progress to permanent kidney failure, which requires a person to undergo kidney transplant or blood filtering treatment called dialysis regularly.<sup>4</sup>

Globally, Chronic Kidney Disease affects approximately 10% of adults and is typically irreversible. Its prevalence is on the rise, with projections indicating that it could rank as the fifth most common cause of years of life lost worldwide by 2040<sup>1,5</sup>.

In India, diabetes and hypertension today account for 40–60% cases of Chronic Kidney Disease<sup>6</sup>.

As per recent Indian Council of Medical Research data, prevalence of diabetes in Indian adult population has risen to 7.1%, and in urban population the prevalence is as high as 28%.<sup>[7,8]</sup> Likewise the reported prevalence of hypertension in the adult population today is 17% (14.8% from rural and 21.4% from urban belt). With rising prevalence of these diseases in India, prevalence of Chronic Kidney Disease is expected to rise, and obviously this is the key target population to address.

Hence, primary care physicians have a crucial role in both managing the early stages of Chronic Kidney Disease as well as in providing comprehensive care

along with nephrologists in the advanced stages of this disease.<sup>9</sup>

Psychiatric disorders in these patients has an association with poor prognosis and high mortality.<sup>10</sup> The prevalence of anxiety and depression in India was found to be 71% and 69%, respectively. These factors were found to be significantly correlated with unemployment, low income, low education, urban residence, and presence of comorbidities<sup>11</sup>.

Depressive symptoms are among the most frequent comorbidity among patients with Chronic Kidney Disease. The precise prevalence of anxiety disorders in dialysis patients is unclear, but estimates have ranged from approximately 12% to 52% in various studies.<sup>12</sup> As anxiety, depression and related factors are prevalent in patients with Chronic Kidney Disease undergoing dialysis, they significantly affect the sufferer's quality of life and disease outcome.<sup>13</sup> Studies assessing psychiatric morbidity in Chronic Kidney Disease patients undergoing dialysis are few in India. Hence, the present study was planned for evaluation of anxiety and depression in these patients.

## **Material and Methods**

It is a cross-sectional and descriptive study. This study included 78 patients with age above 18 years both, males and females and providing informed consent were included in the study. Patients who have underlying previous psychiatric morbidity. Patients not giving informed consent and were too ill to be assessed were excluded.

The present cross-sectional and descriptive study was conducted at tertiary care hospital ASCOMS. Data was collected over a period of 6 months from patients suffering with chronic kidney disease undergoing dialysis at tertiary care hospital, ASCOMS and was screened for anxiety and depression.

Convenience sampling technique was used to obtain the sample. Appropriate ethical clearance was obtained from the Institutional Ethics Committee of tertiary care hospital ASCOMS and measures were undertaken to maintain confidentiality of caregivers throughout the study and also during the analysis of data. All participants were fully informed about the purpose of the study. Written informed consent was obtained from each participant after the consent form was read by the participants. The consent form was in Hindi and in English, and it stated that the participation was completely voluntary and that the participant could withdraw at any time from the study. Confidentiality was maintained throughout the study.

#### **Inclusion Criteria**

1. Patients undergoing Dialysis more than 18 years of age.
2. Patients who were willing to participate in this study.

#### **Exclusion criteria**

1. Patients who have underlying previous psychiatric morbidity.
2. Patients who have other acute illnesses and not able to participate in the study.
3. Patients not willing to sign the consent form.

#### **Socio demographic data**

This arranged format was used to assess the variables of sociodemographic profile such as gender, age, education status, marital status, religion, income, locality, and type of family.

**The Hamilton Anxiety Rating Scale (HAM-A)** is a clinician-administered tool used to assess the severity of a patient's anxiety symptoms. It consists of 14 items, each rated from 0 (not present) to 4 (very severe), covering both psychological (e.g., anxious mood, fears) and physical symptoms (e.g., gastrointestinal, cardiovascular). Total score range: 0 to 56. It's

commonly used in clinical and research settings to evaluate anxiety levels and monitor treatment progress.

**The Hamilton Depression Rating Scale (HAM-D)**, also known as the Hamilton Rating Scale for Depression (HRSD), is a clinician-administered tool used to assess the severity of depression symptoms, with scores ranging from 0 to 52, where higher scores indicate greater severity.

#### **Statistical Analysis**

Microsoft Excel was used in creating the database and producing graphs, while the data was analysed using the Statistical Package for the Social Sciences (SPSS) version 23 for Windows. Mean and standard deviation ( $\pm$ SD) were used to describe quantitative data meeting normal distribution. Continuous two independent groups were compared by parametric independent Student's t test. Discrete (categorical) groups were compared by chi-square ( $\chi^2$ ) test was used. p values less than 0.05 ( $p < 0.05$ ) was considered statistically significant.

#### **Results and Observations**

In present study the majority of the studied cases were in the age group ranging from 46-55 years (24.36%) with mean age  $48.5 \pm 4.56$  years and slight male predominance (60.26 %). The prevalence of anxiety was 62.82% where 9 patients (11.5%) had mild anxiety, 12 (15.4%) had moderate anxiety, and 28 (35.9%) had severe anxiety. The remaining 29 patients (37.2%) did not have anxiety. The prevalence of depression was 64.10%, where 10 patients (12.8%) had mild depression, while 20 (25.6%) had moderate and another 20 (25.6%) had severe depression. A total of 28 patients (35.9%) did not have depression. For anxiety, the percentage of affected patients is highest among those with Chronic Kidney Disease for 1-3 years (24.36%) and lowest in those with Chronic Kidney

Disease for more than 5 years (2.56%), showing the statistical significant association between the duration of Chronic Kidney Disease and anxiety levels (p-value =0.015). For depression, the percentages vary across

durations but do not show a strong pattern. The highest rate is in the 3–5-year group (23.08%), suggesting no significant association between Chronic Kidney Disease duration and depression (p-value is 0.626).

Table 1: Demographics and baseline characteristics of the studied cases

Demographic profile	No. of patients (n=78)	Percentage (%)
Age (in years)		
25-35	12	15.38
36-45	17	21.79
46-55	19	24.36
56-65	16	20.51
≥66	14	17.95
Mean age ±S.D	48.5 ± 4.56 years	
Gender		
Female	31	39.74
Male	47	60.26
Religion		
Hindu	51	65.4
Muslim	21	26.9
Sikh	6	7.7
Education status		
Graduation	11	14.1
Illiterate	32	41.0
Post graduation	6	7.7
Primary school	14	17.9
Secondary school	1	1.3
Sr. secondary school	14	17.9
Marital status		
Married	60	76.9
Unmarried	18	23.1
Occupation		
Employed	31	39.7
Farmer	9	11.5
Homemakers	20	25.6
Retired	2	2.6

Unemployed	16	20.5
Socio economic status		
Lower class	1	1.3
Lower middle	30	38.5
Middle class	31	39.7
Upper middle	13	16.7
Upper class	3	3.8
Family type		
Joint	31	39.7
Nuclear	47	60.3
Domicile		
Rural	51	65.4
Urban	27	34.6

Table 2: Prevalence of Anxiety and Depression

Mental health	No. of patients (n=78)	Percentage (%)
Anxiety		
Mild	9	11.5
Moderate	12	15.4
Severe	28	35.9
No	29	37.2
Depression		
Mild	10	12.8
Moderate	20	25.6
Severe	20	25.6
No	28	35.9

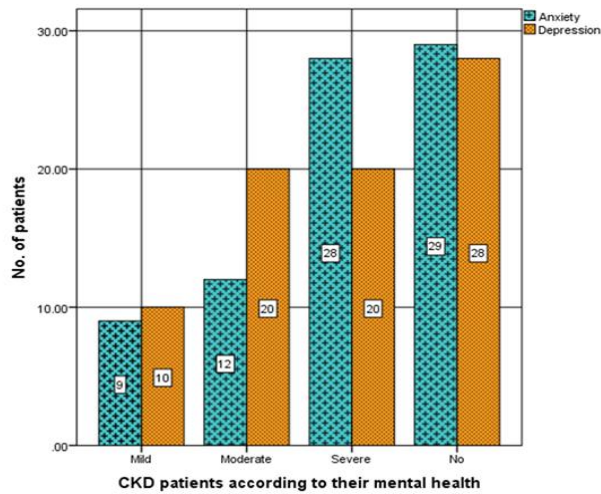


Figure 1: Prevalence of Anxiety and Depression

Table 3: Association between duration of Chronic Kidney Disease and Anxiety, Depression among patients

Duration of Chronic Kidney Disease	Anxiety				p-value
	Yes	%	No	%	
<1 year	15	19.23	04	5.13	0.015 (S)
1-3 year	19	24.36	08	10.26	
3-5 year	15	19.23	11	14.1	
>5 year	02	2.56	04	5.13	
Depression					
<1 year	13	16.67	06	7.69	0.626 (N.S)
1-3 year	15	19.23	12	15.38	
3-5 year	18	23.08	08	10.26	
>5 year	03	3.85	03	3.85	

Table 4: Association between duration of dialysis and Anxiety, Depression among patients

Duration of Dialysis	Anxiety				p-value
	Yes	%	No	%	
<1 year	28	35.9	06	7.69	0.025 (S)
1-3 year	09	11.54	12	15.38	
3-5 year	12	15.38	09	11.54	
>5 year	02	2.56	0	0	
Depression					
<1 year	21	26.92	13	16.67	0.932 (N.S)
1-3 year	13	16.67	08	10.26	
3-5 year	14	17.95	07	8.97	
>5 year	02	2.56	0	0	

## Discussion

Psychiatric morbidity is one of the domains which can significantly influence the quality of life of patients suffering from chronic kidney disease undergoing dialysis. Because anxiety and depression are the most common psychiatric morbidity among CKD patients undergoing dialysis, understanding this issue is vital for comprehensive assessment and care.

In present study the majority of the studied cases were in the age group ranging from 46-55 years (24.36%) with mean age  $48.5 \pm 4.56$  years and male predominance (60.26 %). Our findings were in accordance with the findings of Shankar M et al., (2024)<sup>14</sup> reported that among 374 adult patients (aged >18 years), most patients (72.7%) were men. Mean age in men was  $46.95 \pm 12.65$  years, and women was  $46.63 \pm 13.66$  years. Strong male predominance (72.7%) were seen which closely matches our finding of 60.26%. Mean age in the mid-40s, aligning well with our dominant age groups (46-55 years: 24.36%). According to Kumar V et al., 2018<sup>2</sup> the average age at recruitment is  $50.3 \pm 11.8$  years, with 67.2% of the population being males.

In our study, education levels varied, with the highest proportion being illiterate (41.0%), followed by those with primary (17.9%) and senior secondary education (17.9%). A smaller portion has graduated (14.1%), while fewer have post-graduation degrees (7.7%) or only secondary school education (1.3%). A significant majority are married (76.9%), while 23.1% are unmarried. Our findings are similar with the findings of Goyal E et al., 2018,<sup>15</sup> who studied 49 consecutive Chronic kidney disease patients. The literacy rate of the study group was 60%, which was lower than the national literacy rate of 74%, with 40.8% being completely illiterate, representing the largest single category. Only 18.4% have achieved graduate-level education, while the

remaining population is distributed across primary (12.2%), secondary (16.3%), and higher secondary (12.2%) education levels. the majority (83.7%) are married, while 16.3% remain unmarried.

In our study, the majority (39.7%, 31 individuals) are employed, followed by homemakers (25.6%, 20), unemployed individuals (20.5%, 16), farmers (11.5%, 9), and retired persons (2.6%, 2), the largest group is the middle class (39.7%, 31), closely followed by the lower middle class (38.5%, 30), with smaller proportions in the upper middle (16.7%, 13), upper class (3.8%, 3), and lower class (1.3%, 1), nuclear families (60.3%, 47) significantly outnumber joint families (39.7%, 31). Finally, domicile data shows a predominantly rural population (65.4%, 51), compared to urban residents (34.6%, 27). Our findings are comparable with the findings of Goyal E et al., 2018,<sup>16</sup> where homemakers constitute 10.2%, students make up 8.2%, while self-employed, skilled, and unskilled workers each represent only 2% of the population. Ekbote A et al., 2024,<sup>17</sup> studied 107 Chronic kidney disease, patients (72% male) from dialysis centers across India showed majority (53%) belonged to joint families, around two-thirds (68%) had monthly family income  $>₹20,000$ . (Kumar V et al., 2022),<sup>18</sup> the majority of participants resided in rural areas, with 845 individuals (65.2%) in the first group and 1,781 individuals (66.5%) in the second group, totaling 2,626 participants (66.0%) from rural locations. Urban residents comprised the smaller portion, with 452 individuals (34.8%) in the first group and 898 individuals (33.5%) in the second group, totaling 1,350 participants (34.0%) from urban areas.

In our study, the overall prevalence of anxiety is 62.82%, where majority of the patients (35.9%, n=28) experienced severe symptoms, mild and moderate anxiety were less common, affecting 11.5% (n=9) and 15.4% (n=12) of

patients, respectively, followed by those without anxiety (37.2%, n=29). On the other hand, the prevalence of depression is 64.10%, where moderate and severe cases each accounted for 25.6% (n=20), while 12.8% (n=10) had mild symptoms. Notably, 35.9% (n=28) reported no depressive symptoms. Our findings were consistent with the findings of Ye W et al. (2022),<sup>19</sup> who found that 68.93% of patients had depression and 36.89% had anxiety. Among patients with depression, 39.81% had mild depression and 29.13% had moderate/severe depression. For anxiety, 23.30% had mild anxiety and 13.59% had moderate/severe anxiety. Another study by Palmer S et al. (2015),<sup>20</sup> they found that among dialysis patients (CKD stage 5D), the prevalence of interview-based depression was 22.8%, while using self-administered rating scales showed higher rates of 39.3% for depressive symptoms. Another similar study by Mosleh H et al. (2020),<sup>21</sup> studied 122 chronic kidney disease patients on hemodialysis. Their findings showed that 24.6% had depression and 19.7% had anxiety symptoms.

In our study, the highest prevalence of anxiety (24.36% of total patients) was observed in the 1-3-year chronic kidney disease duration group. The >5-year group had the lowest anxiety prevalence (2.56%). Depression prevalence peaked in the 3-5-year group (23.08%). Study by Ahlawat R et al. (2018),<sup>22</sup> assessed the prevalence of depression in chronic kidney disease patients and found that about 44% of patients had depression. According to multiple logistic regression analysis, the occurrence of depression was significantly higher with duration of chronic kidney disease greater than 2 years (OR 2.2, 1.3-4.3; P<0.05). In our study, the highest prevalence of Anxiety occurs in patients undergoing dialysis for <1 year (35.9%, 28 cases), with rates decreasing over time. A statistically significant association is noted (p-value =

0.025). For depression, the <1-year group has the highest prevalence (26.92%, 21 cases). Our findings are similar with the findings of Gadia P et al., (2020),<sup>9</sup> who found that depression and anxiety were significantly associated with duration of dialysis in these patients. The prevalence of depressive disorder and anxiety disorder was around 66% and 61%, respectively. Both depression and anxiety were more prevalent in patients who were on dialysis for longer duration.

### Limitations

1. The small sample size affects generalizability.
2. Being a cross-sectional study, causality cannot be established.
3. The data cannot be generalized for larger area as the study was carried out in tertiary care hospital.

### Conclusion

In CKD patients undergoing dialysis, anxiety and depression are significantly prevalent. These mental health issues are linked to various factors including the chronic nature of the disease, the physical and emotional burden of dialysis, and the impact on quality of life. Therefore, regular screening for depression and anxiety in CKD patients is crucial for early identification and intervention. The prevalence of anxiety and depression in our study was 62.82% and 64.10% respectively. The highest prevalence of Anxiety (24.36% of total patients) was observed in the 1-3 year CKD duration group. A statistically significant association (p=0.015) was found between CKD duration and anxiety. Depression prevalence peaked in the 3-5 year group (23.08%). A statistically significant association is noted (p-value = 0.025) between the duration of dialysis and the prevalence of anxiety in patients. The highest prevalence of Anxiety occurs in patients undergoing dialysis for <1 year (35.9%, 28 cases). The highest prevalence of

depression was seen in <1 year group (26.92%, 21 cases).

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