

A study on psychiatric comorbidities in patients with chronic kidney disease

¹Dr. Alok N Ghanate, Prof and Head, Department of Psychiatry, MRMC, Kalaburag

²Dr. Preetam, Post graduate Resident, Department of Psychiatry, MRMC, Kalaburag

Corresponding Author: Dr. Alok N Ghanate, Prof and Head, Department of Psychiatry, MRMC, Kalaburag

How to citation this article: Dr. Alok N Ghanate, Dr. Preetam, “A study on psychiatric comorbidities in patients with chronic kidney disease”, IJMACR- May - June - 2022, Vol – 5, Issue - 3, P. No. 15 – 25.

Copyright: © 2022, Dr. Alok N Ghanate, et al. This is an open access journal and article distributed under the terms of the creative commons attribution noncommercial License 4.0. Which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

Type of Publication: Original Research Article

Conflicts of Interest: Nil

Abstract

Background: Chronic kidney disease one of the chronic diseases emerging as a public health problem in developing countries such as India and the prevalence of which is more among elderly patients. Psychiatric illness is highly prevalent in such patients and remain undertreated despite significant negative consequences on patients' health. The frequently observed mental health disorders are affective disorders particularly depression, organic brain diseases, substance use disorders, anxiety and others.

Aims and objectives: To study the Prevalence of psychiatric comorbidities and the relationship between these with socio demographic profile in patients diagnosed with CKD.

Methodology: 102 patients aged >18 years of either sex attending Psychiatry OPD who met the criteria for CKD and provided informed consent were included in the study. Critically ill patients and patients with mental illness prior to the onset of CKD were excluded. A semi-structured proforma was used to record sociodemographic details and Modified Kuppaswamy

scale for socioeconomic status. Psychiatric morbidity was assessed using MINI international neuropsychiatric interview.

Results: The mean age of cases was 49.96 years with male preponderance (55.9%). Most of the them were Hindus (70.6%), majority of them (40 %) belonged to upper lower socioeconomic status and were farmers by occupation. Majority of cases (32.4%) had major depressive disorder among which 4.9% high suicidality followed by adjustment disorder (17.6%). Major depressive disorder (MDD) was more common in the age group of 21-40 years and with low socioeconomic population. Adjustment disorder was more common among older population.

Conclusion: Psychiatric comorbidities are very common among CKD patients and are often underdiagnosed. It is important for clinicians dealing with these cases to have high degree of suspicion for psychiatric disorders and a robust screening policy at the beginning of the diagnosis.

Keywords: Chronic kidney disease, Psychiatric illness, Major depressive illness, Psychosis

Introduction

Chronic kidney disease (CKD) is an emerging public health problem in developing countries such as India. CKD is emerging to be an important chronic disease globally. The worldwide prevalence is estimated to be 13.4% (11.7-15.1%).¹ It is estimated that number of cases of CKD will increase disproportionately in developing countries, such as India, where the number of elderly people are increasing.²

According to the data of CKD registry of India, Indian Society of Nephrology from 107 centres across India, 54813 patients were suffering from CKD. Of which 48.1% were in ESRD. 60% of the ESRD cases were managed with conservative treatment and around 20% were on maintenance haemodialysis.³

Treatment costs for CKD rose after the 1960s, with availability of renal replacement techniques making possible the long-term application of life-saving but costly treatment for patients with end-stage kidney disease (ESKD). The number of people receiving renal replacement therapy exceeds 2.5 million and is projected to double to 5.4 million by 2030.⁴

Psychiatric illness are highly prevalent in patients with chronic disease, but remain undertreated despite significant negative consequences on patients' health. Affective disorders particularly depression, organic brain diseases, substance use disorders, anxiety and others. The prevalence of psychiatric illness has been found to be about 32%-45% in patients with CKD depending on the method used to assess it.⁵

The prevalence of depression is 3 to 4 times higher in patients with CKD and ESRD compared with the general population and 2 to 3 times higher compared to individuals with other chronic illnesses.⁶ The precise prevalence of anxiety disorders in haemodialysis patients

is unclear, but estimates have ranged from approximately 12% to 52% in various studies.⁷ It imposes a variety of physical and psychosocial stressors that challenge not only the patients but also the caregivers.⁹

There are very few Indian studies on psychiatric comorbidities in CKD patients. The present study aimed at determining the prevalence of various psychiatric disorders among CKD patients. The primary objectives of this study were identifying the prevalence of psychiatric comorbidities in patients diagnosed with CKD and to study their relationship between the socio demographic profile of the recruited study population.

Materials and methodology

We conducted a prospective observational study between 1st October 2019 – 31st March 2021 for the period of 18 months by recruiting the patients diagnosed with CKD attending Psychiatry OPD, Nephrology OPD/IPD and Dialysis unit at Basaveshwara Teaching and General Hospital attached to Mahadev Appa Ram pure Medical College, Kalaburagi.

Sampling Method: Simple Random sampling.

Sample size calculation

n = sample size for study group

In the reference study conducted by Ekram Goyal, Suprakash Chaudhury et.al.

Prevalence rate of psychiatric comorbidities in CKD =

P = 45.0% Q = 55.0

L = Permissible error was 25% of P was

Power of study was 80.0

Sample size (n) = $Z2\alpha PQ/L2$

= $(1.96)2 \times 45.0 \times 55.0 / (0.25)2$

n = $3.845 \times 45.0 \times 55.0 / 0.0625$

n = 9516.374/104.65

n = 71.95

The estimated Sample size $n = 100$ cases were taken as sample size in the study, but in the present study 102 cases were included.

Inclusion criteria

- Patients diagnosed to have CKD fulfilling the criteria of GFR <60 mL/min/1.73 m² or albuminuria ≥ 30 mg per 24 hours for more than 3 months.
- Age above 18 years, either sex

Exclusion criteria

- Patients with mental illness prior to the onset of CKD.
- Critically ill patients who are intubated or are on ventilator.

Methodology

Written informed consent was taken from the patients and patients’ relatives in their own vernacular language. A self-designed semi structured questionnaire having personal and demographic data of the patients such as age, education, marital status, occupation, residence (domicile), income levels and details regarding the disease was given to the study participants. Modified Kuppuswamy scale for socioeconomic status was used to analyse the socioeconomic status of the study sample.⁶² MINI international neuropsychiatric interview 7.0.2 was used to assess the psychiatric illness.^{59,60,61}

Statistical data analysis

The data collected will be analyzed statistically by using IBM SPSS software 20.0 using descriptive statistics namely mean standard deviation for quantitative variables and presented as counts and percentage. For quantitative data analysis t-test was applied. For qualitative data analysis Chi square and Fisher exact test was applied for significance. If p value less than 0.05 considered as significant.

Results

Table 1: Age wise distribution of cases

Age in years	Number of cases	Percentage
21—40	27	26.5
41—60	58	56.8
61—80	17	16.7
Total	102	100.0

Mean age of the study population was 49.96 ± 10.6 years. Table 1 illustrates the distribution of age among the recruited study population. Majority of cases 58 (56.8%) belonged to the age group of 41-60 years followed by 27 (26.5%) cases belonged to the age groups of 21-40 and the rest were aged between 21 to 40 years.

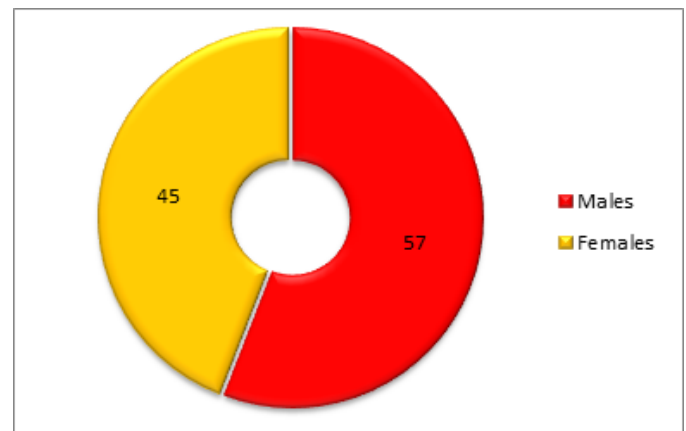


Figure 1: Pie diagram representing gender wise distribution of cases

Figure 1 represents the distribution of gender among the recruited cases. Out of 102 cases, 57 (55.9%) were males and 45 (44.1%) females with male: female ratio of 1.27:1

Table 2: Educational status wise distribution of cases

Educational status	Number of cases	%
Illiterate	40	39.2
Primary school	21	20.6
High school	36	35.3
Graduate	4	3.9

Professional/Honours	1	1.0
Total	102	100.0

Above is the self-explanatory table with illustrating the distribution of educational status of the recruited participants. Majority of cases 40 (39.2%) were illiterate followed by 36 (35.3%) of cases had studied till high school, 21 (20.6%) of cases till primary school, 4 (3.9%) of cases till graduation and 1 (1.0%) had a degree of Professional/Honours.

Table 3: Occupation wise distribution of cases

Occupation	Number of cases	Percentage
Unemployed	23	22.5
Housewife	22	21.6
Farmer	25	24.5
Unskilled worker	19	18.7
Skilled worker	9	8.8
Business	4	3.9
Professional	0	0.0
Total	102	100.0

In the current study, out of 102 cases majority were farmers i.e. 25 (24.5%), followed by 23 (22.5%) who were unemployed and 22 (21.6%) were housewives. Distribution of others occupations is as mentioned in the table 3.

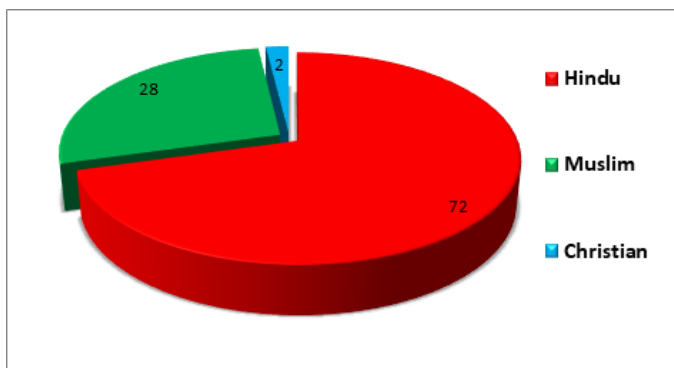


Figure 2: Pie diagram represents religion wise distribution of cases

Out of 102 cases majority of them were Hindus which were accounted for around 72 (70.6%) followed by 28 (27.4%) Muslims and 2 (2.0%) Christians which is illustrated in the above figure 2.

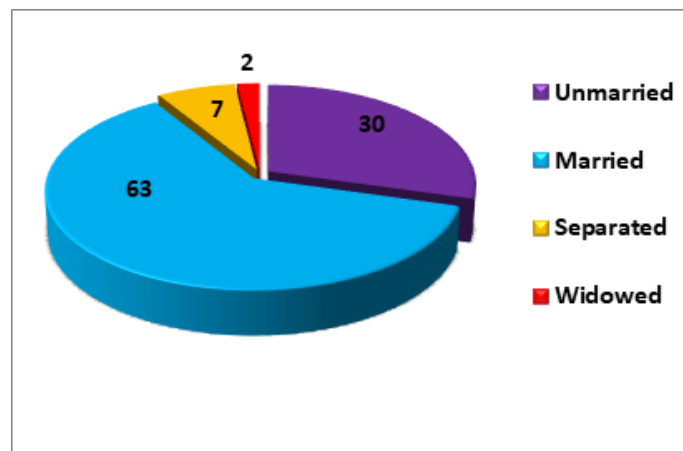


Figure 3: Pie diagram represents marital status wise distribution of cases

Figure 3 illustrates the distribution of marital status of the recruited study population. Out of 102 study population, 63 (61.8%) were married, 30 (29.4%) were unmarried, 7 (6.8%) were separated and 2 (2.0%) were widowed.

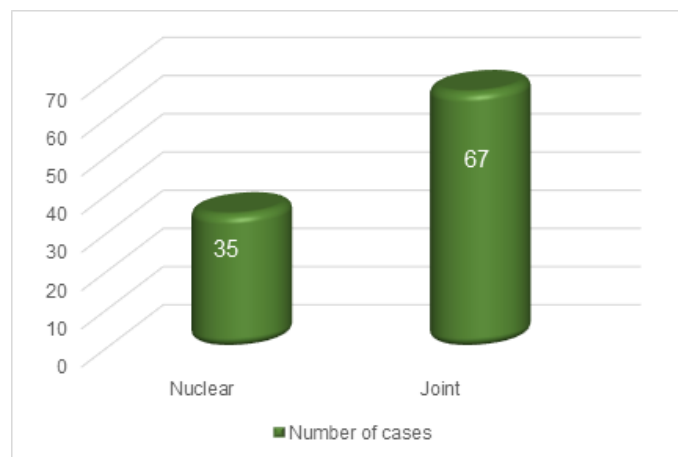


Figure 4: Distribution of cases according to type of family

In the present study, 67 (65.7%) lived in a joint family and 35 (34.3%) lived in a nuclear family. The same is depicted as pie chart in figure 4.

Table 4: Distribution of cases according to socio-economic status

Socio-economic status	Number of cases	Percentage
Upper class	5	4.9
Upper middle class	19	18.7
Lower middle class	23	22.5
Upper lower class	44	43.1
Lower class	11	10.8
Total	102	100.0

The present study shows majority of cases 44 (43.1%) belonged to the upper lower class, followed by 23 (22.5%) which belonged to lower middle class, 19 (18.7%) belonged to upper middle class, 11 (10.8%) belonged to lower class and 5 (4.9%) were upper class. This distribution is explained in table 4.

Table 5: Distribution of CKD cases according to psychiatric comorbidities

Psychiatric comorbidities		Number of cases	Percentage
Major depressive disorder (MDD)	Current	33	32.4
	No	69	67.6
Adjustment disorder (AD)	Current	18	17.6
	No	84	82.4
Generalized anxiety disorder (GAD)	Current	4	3.9
	No	98	96.1
Panic disorder	Current	5	4.9

(PD)	No	97	95.1
Alcohol use disorder (AUD)	Yes	3	2.9
	NO	99	97.1
Suicidality	Low	5	4.9
	Moderate	6	5.9
	High	5	4.9
	NO	86	84.3

Table 5 and Figure 5 explains the distribution of associated psychiatric illness observed in the recruited study population. In the present study out of 102 CKD cases; majority of cases 33 (32.4%) had major depressive disorder (MDD). Followed by 18 (17.6%) of cases had adjustment disorder (AD), 4 (3.9%) of cases had Generalized anxiety disorder (GAD), 5 (4.9%) of cases had panic disorder and 3 (2.9%) of cases had Alcohol use disorder (AUD) and 16 (15.8%) of cases had suicidality of which 5 (4.9%) showed low, 6 (5.9%) moderate and 5 (4.9%) high suicidality.

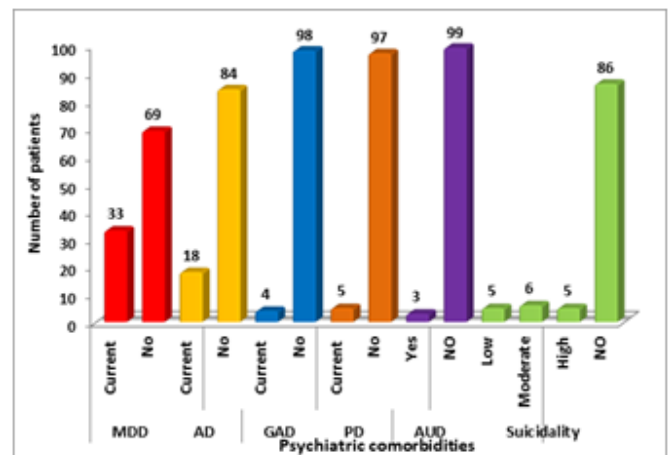


Figure 5: Bar diagram represents psychiatric comorbidities wise distribution of CKD cases.

Table 6: Relationship between age and psychiatric comorbidities in CKD cases

Psychiatric comorbidities	No. of cases		Age in years			Fisher exact test
			21-40	41-60	61-80	
Major depressive disorder (MDD)	33	Current	8 (29.6%)	19 (32.7%)	6 (35.2%)	P = 0.041 S
	69	No	19 (70.4%)	39 (67.3%)	11 (64.8%)	
Adjustment disorder (AD)	18	Current	2 (7.4%)	11 (18.9%)	5 (29.4%)	P = 0.042 S
	84	No	25 (92.6%)	47 (80.1%)	12 (70.6%)	
Generalized anxiety disorder	4	Current	2 (7.4%)	2 (3.4%)	0 (0.0%)	P = 0.216 NS
	98	No	25 (92.6%)	56 (96.6%)	17 (100.0%)	
Panic disorder (PD)	5	Current	2 (7.4%)	3 (5.2%)	0 (0.0%)	P = 0.289 NS
	97	No	25 (92.6%)	55 (94.8%)	17 (100.0%)	
Alcohol use disorder	3	Yes	2 (7.4%)	1 (1.7%)	0 (0.0%)	P = 0.108 NS
	99	No	25 (92.6%)	57 (98.3%)	17 (100.0%)	
Suicidality	5	Low	0 (0.0%)	4 (6.9%)	1 (5.9%)	P = 0.091 NS
	6	Moderate	1 (3.7%)	4 (6.9%)	1 (5.9%)	
	5	High	1 (3.7%)	4 (6.9%)	0 (0.0%)	
	86	No	25 (92.6)	46 (79.3%)	15 (88.2%)	
Total	--	--	27	58	17	--

NS = not significant, S=significant,

HS=highly significant, VHS=very highly significant

The present study shows 29.6% of the patients with CKD who had MDD belonged to the age group of 21-40 years which is statistically significant with P<0.05. On

the other hand, 29.4% of the patients with CKD who had AD belonged to the age group of 61-80 which is statistically significant with P<0.05. There was no statistical significant association between age and other psychiatric comorbidities (P<0.05)

Table 7: Relationship between gender and psychiatric comorbidities in CKD cases

Psychiatric Comorbidities	No. of cases		Gender		Fisher exact test
			Male	Female	
Major depressive disorder (MDD)	33	Current	21 (38.8%)	12 (26.7%)	P = 0.063 NS
	69	No	36 (61.2%)	34 (73.3%)	
Adjustment disorder (AD)	18	Current	11 (19.3%)	7 (15.6%)	P = 0.493 NS
	84	No	46 (80.7%)	38 (84.4%)	
Generalized anxiety disorder	4	Current	3 (5.3%)	1 (2.2%)	P = 0.340 NS
	98	No	54 (94.7%)	44 (97.8%)	
Panic disorder (PD)	5	Current	2 (3.5%)	3 (6.7%)	P = 0.414 NS
	97	No	55 (96.5%)	42 (93.3%)	

Alcohol use Disorder	3	Yes	3 (5.3%)	0 (0.0%)	P = 0.018
	99	NO	54 (94.7%)	45 (100.0%)	S
Suicidality	5	Low	5 (8.8%)	0 (0.0%)	P = 0.085
	6	Moderate	3 (5.3%)	3 (6.7%)	NS
	5	High	3 (5.3%)	2 (4.4%)	
	86	NO	46 (80.6%)	40 (88.9%)	
Total	--	--	57	45	--

NS= not significant, S=significant, HS=highly significant, VHS=very highly significant

In the present study among the CKD patients who had AUD (5.3%) all of them were male showing a statistically significant association between gender and Alcohol use disorder with $P < 0.05$. There is no statistical significant association between gender and other psychiatric comorbidities ($P > 0.05$).

In the current study there no was statistical significant association between domicile, the type of family there are living in, Socio economic status, religion of the recruited CKD patients and the associated psychiatric illness.

Discussion

The present study is a cross sectional observational study aimed at assessing the sociodemographic profile and psychiatric comorbidities of CKD patients in our epidemiological area.

The mean age of 102 patients recruited in the study was 49.96 years. Majority of the patients (56.8 %) in our study were aged between 40 to 60 years. As per the CKD registry of India mean age is 50.1 years with a standard deviation of 14.6. The distribution of age of the patients observed in our study was consistent with other studies conducted by Afsin et al.¹⁰ Ravi Rana et al.¹¹ Cukor et al.¹² and Patel et al.¹³ in which the mean age was 47.5, 57, 53.2 and 57.5 years respectively. The lower incidence of ESRD among older patients

compared to younger ones as observed in the present study could be likely due to their greater competing risk for death.¹⁴

In the present study 55.9% (n=7) were male and 44.1% (n=45) were female. In a study by Rai et al., the population constituted of 68% males and 32% females. Also, the study by Afsin et al.¹⁰ and Ravi Rana et al.¹¹ also had almost similar gender distribution. Whereas the observation was contrary in a study by Patel et al.¹³ where they found 46.6% are males and 53.4% females. Kidney function is reported to be declining faster in men than women, possibly owing to unhealthier lifestyles in men such as smoking, alcoholism and the lack protective effects of oestrogens or the damaging effects of testosterone.¹⁵⁻¹⁷

In this study 61.8% were married, 29.4% of cases were unmarried. In a study by Afsin et al.¹⁰, 61% were married and 38.2% were single. Aghawana et al.¹⁸ reported that 80% were married. Majority of the population was married; this might be due to the fact that India has one of the lowest ages at marriage.¹⁹

In the present study majority (43.1%) of the population belongs to upper lower class and 22.5% belong to lower middle classes. This is consistent with the statistics from CKD registry in India³ and Gadia P et al.²⁰ and Kao YY et al.²¹ This could be explained by the fact that the hospital caters to the low-income population who have a lower literacy rate and less income than the general

population and by the availability of free or affordable treatment in the hospital.²²

In our study Hindus constitute 70.6%, Muslims 27.4.4% and Christians constitute 2% of the total sample. The results are consistent with Taskapan et al.²³, Aghawana et al.¹⁸, Patel et al.¹³ This could be explained by the fact that Hindus constitute majority population of India.²⁴

In the current study 17.6% had adjustment disorder. In studies conducted by Goyal et al.²⁵ and Campbell EA et al.²⁶ adjustment disorder was seen in 12.2% and 14.3% of the cases respectively. This could be explained by continuous exposure to dialysis, lifestyle changes, feeling of helpless due to unpreparedness or limited understanding of the disease. The precise prevalence of anxiety disorders in CKD patients is unclear, but estimates have ranged from approximately 12% to 52% in various studies²⁷ but in the current study 3.9% of the population had generalized anxiety disorder which is similar to the report by Goyal et al.²⁵ with 2% of the cases.

In the current study 4.9% of the population had panic disorder. In a study conducted by Elhadad AA et al.²⁸ 7.7% of patients had panic disorder. This could be explained by the increasing stress which adds to uncertainty about future and fear of losing control of one's life.²⁹

In the current study 2.9% of the population had alcohol use disorder. In studies conducted by Goyal et al.²⁵ substance use disorder was seen in 2.4% of the cases and 3.6% according to Campbell EA et al. Alcohol has been an important contributing factor to the progression of CKD⁸. Compared with non-drinking, regular and occasional binge drinking was associated with a 2.2-fold and a 2.0-fold increase in progression of CKD.³⁰ Alcohol consumption can interfere with electrolyte and acid base

balance and body fluids, which can negatively affect kidney function and hence the increased prevalence.³¹

In the current study suicidality was found to be 16% in the past 1 month in which 4.9% of cases showed low suicidality, 5.9% moderate and 4.9% high suicidality. Another study showed 17.3% patients had suicidality in the past 1 month with high suicidality rates in 3.4% of the patients and moderate suicidality in 13.9% of patients. In a study by Chen et al.³² 21.5% had suicidal ideation. Suicidal ideations are more prevalent not only in patients with CKD but also among patients with other chronic medical conditions. This is caused by decrease in the quality of life. Recent studies have found that systemic inflammation and oxidative stress may have direct effects on the central nervous system, resulting in a close relationship with CKD and suicide.³³

In the current study majority (29.6%) of the depressed patients belonged to the age group of 21-40 years which was statistically significant. Demographic factors like younger age have been associated with depression secondary to CKD (Kop et al., 2011; Fischer et al., 2012; Tsai et al., 2012).³⁴ In the current study 29.4% of the patients with adjustment disorder belonged to the age group of 61-80 years which was statistically significant. The results are consistent with Taskapan et al.²³ and Patel et al.¹³ Our study showed that 3 CKD patients had Alcohol use disorder and all of them were male which is in consistent with the result found by Campbell EA et al.,²⁶ Danial Cukor et al.¹² This could be explained by the fact that in a conservative society such as ours, male patients are more likely to use alcohol as a way to cope with increasingly stressful life than females.

Limitations

1. Sample size is small
2. Sample is taken from patients visiting a tertiary care centre and hence results cannot be generalised.
3. Long term follow up was not done.

Conclusion

Psychiatric comorbidities are found commonly among patients with chronic diseases such as CKD. Majority of the study population was Married (61.8%), Hindu (70.6%), Male (55.9%), aged between 41 and 60 years (56.8%), living in a joint family (65.7%). Major depressive disorder (32.4%) was the most common psychiatric morbidity and which was associated with poor socioeconomic status followed by the adjustment disorder (17.6%), Generalized anxiety disorder (4.9%), panic disorder (2.9%), Alcohol use disorder (2.9%) and (4.9%) showed low suicidality, (5.9%) moderate and (4.9%) high suicidality.

References

1. Lv, J. C., Zhang, L. X et al. Prevalence and Disease Burden of Chronic Kidney Disease. *Advances in experimental medicine and biology*.2019. 1165, 3–15. https://doi.org/10.1007/978-981-13-8871-2_1.
2. Singh AK, Farag YM, Mittal BV, Subramanian KK, Reddy SR, Acharya VN, et al. Epidemiology and risk factors of chronic kidney disease in India—results from the SEEK (Screening and Early Evaluation of Kidney Disease) study. *BMC nephrology*. 2013 May 28;14(1):114.
3. Soykan A, Boztaş H, Kutlay S, Ince E, Aygör B, Özden A, Nergizoglu G, Berksun O. Depression and its 6-month course in untreated hemodialysis patients: a preliminary prospective follow-up study in Turkey. *International journal of behavioral medicine*. 2004;11(4):243-6.

4. Liyanage T, Ninomiya T, Jha V, Neal B, Patrice HM, Okpechi I, et al. Worldwide access to treatment for end-stage kidney disease: a systematic review. *The Lancet*. 2015 May;385(9981).
5. Aggarwal HK, Jain D, Dabas G, Yadav RK. Prevalence of Depression, Anxiety and Insomnia in Chronic Kidney Disease Patients and their Co-Relation with the Demographic Variables. *PRILOZI*. 2017 Sep 1;38(2):35–44.
6. Shirazi an, Shayan et al. “Depression in Chronic Kidney Disease and End-Stage Renal Disease: Similarities and Differences in Diagnosis, Epidemiology, and Management.” *Kidney international reports* vol. 2,1 94-107.
7. Murtagh FE, Addington-Hall J, Higginson IJ. The prevalence of symptoms in end-stage renal disease: A systematic review. *Adv Chronic Kidney Dis* 2007; 14:82-99.
8. Varma PP. Prevalence of chronic kidney disease in India - Where are we heading? *Indian Journal of Nephrology*.2015;25(3):133-135.
9. Yeh S-CJ, Huang C-H, Chou H-C. Relationships among coping, comorbidity and stress in patients having hemodialysis. *Journal of Advanced Nursing*. 2008 Jul;63(2).
10. Um-e-Kalsoom, Khan, S. & Ahmad, I. Impact of hemodialysis on the wellbeing of chronic kidney diseases patients: a pre-post analysis. *Middle East Curr Psychia* 2020; 27: 54-61
11. Rana RK et al, free papers (oral). Impact of National Mental Health Programme on the status of psychiatric illnesses in India. *Indian J Psychiatry*. 2015 Jan;57(Suppl 1): S11–S112.
12. Daniel Cukor, * Jeremy Coplan, * Clinton Brown, Steven Friedman, Allyson Corm well-Smith, * Rolf A.

Peterson, and Paul L. Kimmel. Depression and Anxiety in Urban Hemodialysis Patients Clin J Am Soc Nephrol 2:484-490, 2007.

13. M L Patel Reksha Sachan Anil Nischal Surendra Anxiety and depression-A suicidal risk in patients with chronic renal failure on maintenance hemodialysis international journal of scientific research and publications. Mar 2012.

14. Kurella Tamura M. (2009). Incidence, management, and outcomes of end-stage renal disease in the elderly. Current opinion in nephrology and hypertension, 18(3), 252–257.

15. Carrero, J., Hecking, M., Chesnaye, N. et al. Sex and gender disparities in the epidemiology and outcomes of chronic kidney disease. Nat Rev Nephrol. 2018; 14(1):151–164.

16. Abraham G, Jayasheelan T, Matthew M, Padma P, Saravanan AK, Lesley N, et al. Resource settings have a major influence on the outcome of maintenance hemodialysis patients in South India. Hemodial Int. 2010; 14:211–7.

17. Manan Dhār DN, Chhetri PK, Tiwari R, Lamichhane S. Evaluation of dialysis adequacy in patients under hemodialysis and effectiveness of dialysere reuses. Nepal Med Coll J. 2009; 11:107–10.

18. Aghanwa HS, Morakinyo O (1997) Psychiatric complications of hemodialysis at a kidney centre in Nigeria. J Psychosom Res, 42 (5):445-451.

19. Desai S, Andrist L. Gender scripts and age at marriage in India. Demography. 2010; 47:667–87.

20. Gadia P, Awasthi A, Jain S, Kool Wal GD. Depression and anxiety in patients of chronic kidney disease undergoing hemodialysis: A study from western Rajasthan. Journal of Family Medicine and Primary Care. 2020;9(8):4282.

21. Kao YY, Lee WC, Wang RH, Chen JB. Correlation of sociodemographic profiles with psychological problems among hospitalized patients receiving unplanned hemodialysis. Renal failure. 2020;42(1):255-62.

22. Hedayati SS, Minhaj Uddin AT, Toto RD, Morris DW, Rush AJ. Prevalence of major depressive episode in CKD. American journal of kidney diseases: the official journal of the National Kidney Foundation. 2009;54(3):424-432.

23. Taskapan H, Ates F, Kaya B, et al. Psychiatric disorders and large interdialytic weight gain in patients on chronic hemodialysis. Nephrology (Carlton). 2005;10(1):15-20.

24. Kumar V, Khandelia V, Garg A. Depression and anxiety in patients with chronic kidney disease undergoing hemodialysis. Annals of Indian Psychiatry. 2018;2(2):115.

25. Goyal E, Chaudhury S, Saldanha D. Psychiatric comorbidity in patients undergoing hemodialysis. Industrial psychiatry journal. 2018;27(2):206.

26. Campbell EA, Olagunju AT, Oyatokun BO, Adeyemi JD. Psychiatric Morbidities and Associated Factors among Individuals with End Stage Renal Disease in Lagos, Nigeria. Nigerian Quarterly Journal of Hospital Medicine. 2014;24(3):189-94.

27. Murtagh FE, Addington-Hall J, Higginson IJ. The prevalence of symptoms in end-stage renal disease: A systematic review. Adv Chronic Kidney Dis. 2007; 14:82–99.

28. Elhadad AA, Ragab AZ, Atia SA. Psychiatric comorbidity and quality of life in patients undergoing hemodialysis. Middle East Current Psychiatry. 2020;27(1):1-8.

29. Jadhav BS, Dhavale HS, Dere SS, Dadarwala DD. Psychiatric morbidity, quality of life and caregiver burden in patients undergoing hemodialysis. *Medical Journal of Dr. DY Patil University*. 2014;7(6):722.
30. Joo YS, Koh H, Nam KH, et al. Alcohol Consumption and Progression of Chronic Kidney Disease: Results From the Korean Cohort Study for Outcome in Patients with Chronic Kidney Disease. *Mayo Clin Proc*. 2020;95(2):293-305.
31. Epstein M. Alcohol's impact on kidney function. *Alcohol Health Res World*. 1997;21(1):84-92.
32. Chen CK, Tsai YC, Hsu HJ, Wu IW, Sun CY, Chou CC, Lee CC, Tsai CR, Wu MS, Wang LJ. Depression and suicide risk in hemodialysis patients with chronic renal failure. *Psychosomatics*. 2010;51(6):528.
33. Jhee JH, Lee E, Cha MU, et al. Prevalence of depression and suicidal ideation increases proportionally with renal function decline, beginning from early stages of chronic kidney disease. *Medicine (Baltimore)*. 2017;96(44): e8476.
34. Simões E Silva AC, Miranda AS, Rocha NP, Teixeira AL. Neuropsychiatric Disorders in Chronic Kidney Disease. *Front Pharmacol*. 2019; 10:932.