



## The prevalence of depression among chronic kidney disease patients on hemodialysis: A cross sectional study

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### Abstract

**Objective:** To assess the prevalence of depression among chronic kidney disease patients undergoing hemodialysis.

**Materials and Method:** A hospital based Cross Sectional study was conducted on 106 patients in Hemodialysis Unit of Department of Nephrology, Kamineni Academy of medical sciences, and Hyderabad from the year January 2019- December 2020. Collected data were analyzed by using SPSS Ver. 25.

**Results:** A total of 106 patients were screened out of which 67 were males and 39 were female. The mean age of patients was  $52.73 \pm 11.22$  years. Out of 106 patients 65 had depressive symptoms. The depressive disorders was higher in the age group more than 60 years. In the current study among sociodemographic factors including gender, marital status, education, type of family and income were taken into consideration. The factors which was not significantly associated with depression were gender, type of family and family income.

**Conclusion:** In our study we observed that the prevalence of depression was more common in CKD patients undergoing hemodialysis. Patients' Body Mass Index & residence were found to be significant relationship with CKD patients. Therefore, an early diagnosis of depression could be helpful in improving the quality of life of CKD patients.

**Keywords:** CKD, depression, hemodialysis, nephrology, body mass index

### Introduction

Chronic kidney disease has been increasing worldwide due to growing prevalence of diabetes and hypertension worldwide [1]. Chronic kidney disease is a major public health problem and in spite of advances in the management of end stage renal disease, mortality still remains high and many of them have low quality of life attributable to both physical and psychological disorders. Depression has a lifetime incidence of 10% in the general population, but is more common among patients with chronic kidney disease (CKD). Up to 1/3 of hemodialysis patients have depressive symptoms consistent with the diagnosis of depression. Depression has been described as the most frequent psychological problem in patients with ESRD [2, 3]. The psychological health of patients with end-stage renal disease (ESRD) has been the subject of concern for many years, since the beginning of dialytic therapy for ESRD [4, 5, 6, 7].

Dialysis patients frequently exhibit a depressive affect (pessimism, anhedonia, sadness, complaints of feeling helpless and hopeless). These symptoms may result in changes in sleep, concentrating ability, appetite, activity level, and libido and contribute to problems with marital and family relationships and reduced occupational activity.

The treatment options for ESRD fall into two broad categories: peritoneal and hemodialysis or kidney transplantation. The focus of this paper is hemodialysis, the most prevalent treatment option.

It is under recognised in haemodialysis patients because healthcare providers giving facilities, treatment and routinely work with these patients cannot give attention to control depression due to the nature of their illness [8]. There is a need of regular implementation of screening of depression among this population. Depression and anxiety

both are strongly associated with patient's quality of life (QOL).

Currently the relationship between depression, suicide and anxiety remains poorly understood. Objective of this study was to assess the prevalence of depression among chronic kidney disease patients undergoing haemodialysis.

### Materials and Methods

**Study Design and Area:** A hospital based Cross Sectional study was conducted in Haemodialysis Unit of Department of Nephrology, Kamineni Academy of medical sciences, Hyderabad from the year January 2019- December 2020.

**Sample Size:** The sample size was calculated based with a prevalence of 33.3 % reported in an urban population in Lucknow [9]. The sample size was estimated to be 106 with 92% confidence interval and 8% allowable margin of error. This study was approved by the ethical and research committee of Institute. To use human subjects in the research study.

**Inclusion Criteria:** All patients undergoing at least one haemodialysis at department of nephrology, kamineni academy of medical sciences with the age more than 18 years. Was enrolled in the study.

**Exclusion Criteria:** Patients who already had a past history of psychiatry diagnosis. Patients who are CKD but not on maintenance hemodialysis. Patients who refused and did not give consent for the study.

**Chronic Renal Failure (CKD):** A spectrum of different pathophysiologic processes associated with abnormal kidney function and a progressive decline in glomerular

filtration rate. The K/DOQI definition and classification were accepted with clarification. CKD is defined as kidney damage or glomerular filtration rate (GFR) <60mL/min/1.73m<sup>2</sup> for 3 months or more, irrespective of the cause<sup>4</sup>.

Depression: Major depressive disorder is defined by the Diagnostic and Statistical Manual of Mental Disorders, 4th edition (DSM-IV), as having a loss of pleasure or interest for 2 weeks, accompanied by 5 or more psychological, somatic and behavioural symptoms <sup>[10]</sup>.

Beck Depression Inventory-II (BDI-II)

The BDI is a 21-item self-report instrument. High scores (range 0–63) reflect the presence and severity of depressed mood. The BDI reflects cognitive-affective aspects of depression (e.g. multiple choice items regarding satisfaction with life and guilt) and somatic aspects (e.g. items regarding sleep disturbance and health concerns). Patients who had a BDI score ≥14 were considered to have moderate to severe depression <sup>[11]</sup>.

Statistical Analysis: The data obtained was tabulated, analysed and presented using descriptive statistics as a Mean ± Standard deviation or categorical statistics as a frequency (percentage). To compare categorical variables, chi square test has been used. P values is less than 0.05 was considered statistically significant.

**Results**

A total of 106 patients were screened at nephrology department in the said time duration out of which 67 were males and 39 were female. The mean age of patients was 52.73 ± 11.22 years. In this study majority of the subjects were hindu 90 (84.9%), and were lived in the urban area 71 (67.0%). Majority of the patients were married 93 (87.7%) and lived in a nuclear family 55 (51.9%). Majority of the subjects had a secondary level of education 45 (42.5%) and more than half of the subjects were unemployed 57(53.8%). Majority 70 (66.0%) had a normal BMI. The sociodemographic data is summarized in Table 1.

**Table 1:** Socio demographic variables in the study subjects.

Socio Demographic factor	Variables	Frequency	Percentage
Age in years (Mean ± S.D)		52.73 ± 11.22	
Age	< 20 years	6	5.7%
	20 to 40 years	48	45.3%
	40 to 60 years	41	38.7%
	> 60 years	11	10.3%
Gender	Male	67	63.2%
	Female	39	36.8%
Religion	Hindu	90	84.9%
	Other	16	15.1%
Residence	Urban	71	67.0%
	Rural	35	33.0%
Marital Status	Married	93	87.7%
	Unmarried / Divorced	12	11.3%
	Widower	1	1.0%
Education	Primary	27	25.5%
	Secondary	45	42.5%
	Graduate	26	24.5%
	Post Graduate	8	7.5%
Occupation	Employed	49	46.2%
	Unemployed	57	53.8%
BMI	< 18.5	20	18.9%
	18.5 - 24.9	70	66.0%
	25 - 29.9	11	10.4%
	> 30	5	4.7%
Type of Family	Nuclear	55	51.9%
	Joint	18	17.0%
	Other	33	31.1%

Out of 106 patients 65 had depressive symptoms. The depressive disorders was higher in the age group more than 60 years, but the difference was not statistically significant. Majority of the patients with depression were male but there is no relationship between gender and depression. It observed that among hindu CKD patients, 58.9% patients had depressive disorder but the difference was not statistically significant. Out of 106 patients undergoing

hemodialysis, 71 were living in urban areas. Among 69% of the patients were depressive disorder and this was a statistically significant difference between residence and depression. Also the body mass index, majority of the patients were belong to the normal BMI 70 (66.0%), but there was a statistically significant difference between BMI and Depression in table 2.

**Table 2:** Relationship of Socio demographic variables with depression.

Socio demographic factor	variables	Yes (n = 65)	No (n = 41)	P value
Age	< 20 years (n = 6)	2	4	0.267 (NS)
	20 to 40 years (n = 48)	29	19	
	40 to 60 years (n = 41)	25	16	
	> 60 years (n = 11)	9	2	
Gender	Male (n = 67)	43	24	0.428 (NS)
	Female (n = 39)	22	17	
Religion	Hindu (n = 90)	53	37	0.223 (NS)
	Other (n = 16)	12	4	
Residence	Urban (n = 71)	49	22	0.021 (S)
	Rural (n = 35)	16	19	
Marital Status	Married (n = 93)	61	32	0.097 (NS)
	Unmarried / Divorced (n = 12)	4	8	
	Widower (n = 1)	0	1	
Education	Primary (n = 27)	17	10	0.840 (NS)
	Secondary (n = 45)	27	18	
	Graduate (n = 26)	15	11	
	Post Graduate (n = 8)	6	2	
Occupation	Employed (n = 49)	28	21	0.413 (NS)
	Unemployed (n = 57)	37	20	
BMI	< 18.5 (n = 20)	20	0	0.001 (S)
	18.5 - 24.9 (n = 70)	33	37	
	25 - 29.9 (n = 11)	10	1	
	> 30 (n = 5)	2	3	
Type of Family	Nuclear (n = 55)	34	21	0.993 (NS)
	Joint (n = 18)	11	7	
	Other (n = 33)	20	13	

## Discussion

This cross-sectional observational study was conducted to evaluate the various sociodemographic features and depression in patients with CKD undergoing hemodialysis. The overall, psychiatric morbidity among CKD patients in our study was consistent with several previous studies.

Depression is the most common psychiatric problem in patients with end-stage renal disease. Depressive disorders that occur in chronic kidney disease lower the quality of life of patients and also according to studies increase their mortality [2, 3, 12]. The mechanism whereby depression impacts on quality of life and survival include non-compliance with medications and dialysis prescription, poor nutrition and possible increased inflammation from dysregulation of cytokine metabolism [2, 3].

In our study using Beck Depression Inventory (BDI) 61.3 % had depressive. In a similar study done by Patel et al [9] in Lucknow had 33.3 % had depressive symptoms. In another study by Chen et al had 35 % had depressive symptoms [13].

In another study by Zhang et al [14] showed that prevalence of depression was 39.3%. In another study the overall meta-analytic prevalence of depression was 22.8% in 249 individual study population and there was evidence of high level of heterogeneity. The report also showed that self-report scales may overestimate the presence of depression [15]. The prevalence of depression in our study is higher than that observed by most of the other studies. This variability may be due to sample size, heterogeneity in CKD severity between samples and differences in scales used to assess the depressive symptoms. The Chennai Urban Rural Epidemiology Study (Cures- 70) was the largest population-based study from India to report on prevalence of depression and showed that the prevalence of depression was 15.1%. Thus the prevalence rates of depression in patients [16] undergoing haemodialysis is higher than that reported in general population.

In the current study among sociodemographic factors including gender, marital status, education, type of family and income were taken into consideration. The factors which was not significantly associated with depression were gender, type of family and family income. Out of the 67 males 64.2% had depressive symptoms and out of 39 females 56.4% had depressive symptoms. In the general population also generally women had higher chance of being diagnosed of Major Depressive disorder from adolescence to adulthood [17]. Another study done by Zalai et al [18] found that the main factors which influenced the level of psychological distress are patients sociodemographic characteristics (eg. age, gender and family income) and social support.

In this study depressive symptoms was statistically significant association with BMI. Among the patients who were obese only 40.0% in the depression symptoms. Patients who were undernourished or overweight had more depressive symptoms. Thus there was an association between depression and BMI. In a study by Wit. et al [19] done in 43,534 individuals it was found that there was a U shaped association between BMI and depression. It was also found that people with low BMI had more anxiety symptoms. But we should keep the fact that BMI may be affected by various other co morbid medical problems, environmental and genetic factors.

## Conclusion

In our study we observed that the prevalence of depression was more common in CKD patients undergoing hemodialysis. Patients' BMI & residence were found to be significant relationship with CKD patients. Therefore, an early diagnosis of depression could be helpful in improving the quality of life of CKD patients.

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