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## 1 Introduction

Chronic kidney disease (CKD) patients undergoing haemodialysis face significant physical and psychological challenges, often leading to depression and a reduced quality of life. Depression in haemodialysis patients is linked to poor treatment adherence and higher morbidity. Identifying the

burden of depression and its association with daily functioning is crucial for improving patient care and outcomes <sup>1</sup>.

While this treatment helps to sustain life, it can bring major lifestyle changes, loss of independence, and increased health burdens that often lead to mental health challenges, especially depression. Depression is frequently observed in patients on haemodialysis and is linked to a decline in their overall quality of life

# Prevalence of Depression and Quality of Life among Haemodialysis Patients: A Hospital based Cross-Sectional Study

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## Abstract

**Background:** Chronic kidney disease (CKD) is a widespread health issue which may eventually lead to the stage called end stage renal disease (ESRD) where haemodialysis is very much required, globally prevalence CKD is about 10% where in India the prevalence ranges from 5 to 15 %. This study aims to examine depression and quality of life (QoL) among rural haemodialysis patients in Karnataka for better care integration. **Objectives:** 1. To assess the prevalence of depression and quality of life among haemodialysis patients in a tertiary care hospital in the rural south India; 2. To assess the effect of depression on QoL of patients on haemodialysis. **Settings and Design:** It was a hospital based cross sectional study. **Methods and Material:** A cross-sectional study was been conducted among haemodialysis patients in a tertiary care hospital in rural south India from May 2024 to July 2024. By universal sampling 96 haemodialysis patients were assessed for depression and QoL using pre-validated semi structured questionnaire after obtaining informed consent. The Data were in entered in MS Excel spread sheet and statistical analysis was done in SPSS software version 21. **Results:** out of 96 participants 38.54% were suffering from clinical depression with significant low WHO QoL score for all domains of WHO QoL. **Conclusions:** The assessment of depression and QoL among haemodialysis patients declared that a significant proportion is suffering from depression and which adversely affecting their quality of life. So, a regular psychological screening, multidisciplinary support, mental health interventions, and social support programs are essential to improve haemodialysis patients' well-being.

**Keywords:** Depression, Quality of Life, Chronic kidney disease, Haemodialysis

(QoL). Advancements in treatments have enabled maintaining of health in a better way whereas the same is not necessarily true for improvement of quality. Evidence based studies have shown the achievements and advances in people were getting treated for kidney disease along with an increased association of mental health disorders such as depression and anxiety disorders associated with the treatment of chronic kidney disease <sup>2</sup>.

Globally, chronic kidney disease (CKD) affects over 13.6% of the population, accounting for more than 800 million individuals, and represents a rising cause of morbidity and mortality. The prevalence of CKD is particularly high among older adults, with significant disparities observed in lower-income regions where access to early detection and care is limited <sup>3</sup>.

In India, CKD has also become a prominent public health issue, though accurate prevalence data is challenging due to regional variations and limited national registries. Studies estimate the prevalence of CKD in India to range between 5% and 15% of the population, depending on the region and study methods. According to ICMR report on "India: Health of the Nation's States" (2017), CKD is 9th frequent cause of death in India; it rose to 20th cause of DALYs in 2016 from 30th in 1990, indicating the rising burden of CKD. Major cause of this rise in the disease are uncontrolled diabetes, high blood pressure and ageing of the population <sup>4</sup>.

Depression level among haemodialysis patients is concerning not only because it impacts mood but also because it may lead to poor treatment adherence, increased hospital visits, and overall lower health outcomes. Improving the understanding of depression and its impact on QoL in haemodialysis patients is critical for healthcare providers, as it allows for more targeted interventions that address both the physical and emotional needs of these patients <sup>5</sup>.

Therefore, among haemodialysis patients this should give utmost importance in terms of early detection, treatment and counselling. There is sparse data regarding high prevalence of depression in chronic kidney disease among the rural south Indian population, hence the present study was undertaken with the objective to estimate the proportion of depression and quality of life among haemodialysis patients in a tertiary care hospital in the rural belt of Karnataka and also to assess the effect of depression on QoL Score of patients on haemodialysis was considered as a secondary objective.

## 2 Subjects and Methods

A cross-sectional study has been conducted among haemodialysis patients in a tertiary care centre in rural south India from May 2024 to July 2024. All chronic kidney disease patients undergoing maintenance haemodialysis  $\geq 18$  years included in the study by convenient sampling. Participants who were in state of drowsy, comatose, cognitive impairment or critically ill and those who had not given consent also excluded from the study.

Sample size was calculated as 96 by considering the prevalence of depression among CKD patients as 44.05% taken from study by Gupta S et al, in a tertiary care hospital, with 10% absolute error from a published research article <sup>6</sup>. After obtaining written informed consent, the data was collected using pre-validated semi structured questionnaire including sociodemographic and clinical profile where duration and frequency of haemodialysis treatment along with other comorbidities and assessment of depression done using 21-item, self-report rating inventory that measures characteristic attitudes and symptoms of depression Beck's Depression Inventory (BDI) <sup>7</sup>, 21-item, self-report rating inventory. The highest possible score was considered as 63 and lowest was zero. A score up to 10 was considered as normal and 11 to 16 was mild moderate disturbance. Score of 17 to 20, 21 to 30, 31 to 40 and above 40 was considered as borderline, moderate, severe and extreme clinical depression respectively.

Quality of life (QoL) was assessed using WHO QoL BREF questionnaire <sup>8</sup>, which consists of 26 items, two items assess overall quality of life, and 24 items are divided across four domains. Each domain is scored between 4 to 20, which is then transformed to a 0–100 scale for an easier interpretation. Higher scores indicate better quality in that domain and a cutoff of 60 or above in a 0-100 scale was considered as good quality of life and those below 60 were considered as poor quality in each domain <sup>9</sup>, using this the overall QoL and quality of physical health, psychological health, social relationship and environmental domain of participant's life was assessed.

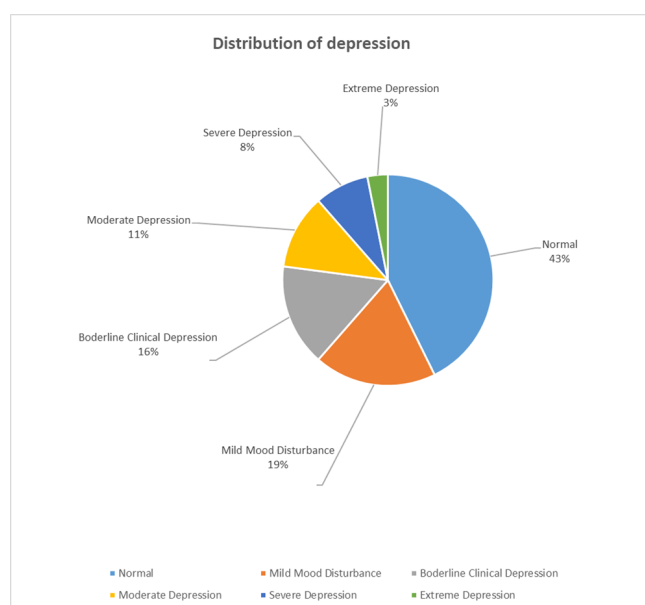
### 2.1 Statistical Analysis

The continuous variables were represented as mean and standard deviation. The categorical variables were represented as frequency and percentage. To obtain the mean comparison of different domain scores with depression, independent two sample t-test was applied.  $P \leq 0.05$  was considered statistically

significant. All the statistical analysis has been done using SPSS Software version 28.

### 3 Results

Out of 96 participants 37 which is 38.54% was found to be having some level of depression among which 16% was having borderline clinical depression and 11% had moderate level of depression, 8% and 3% of them were suffering from severe and extreme level of clinical depression respectively and 18 which is 19% was having only mild mood disturbance (Fig. 1).



**Fig. 1: Distribution of depression**

Among the total haemodialysis patients (n=96), 26 (27.08%) were having poor quality of life and 70 (72.92%) having good quality of life. Domain specific quality of life was varying, 41.7% (n=40) were having poor quality of physical health, 36.5% (n=35) were found to have poor quality of psychological health, 24% (n=23) showed poor quality of social relationships and 20.8% (n=20) were having poor quality of life in environmental domain.

A total of 96 participants were enrolled in this study, 57.29% (n=55) were male and 42.71% (n=41) were female. The mean age of participants was 53.6 years. Majority 33 (34.37 %) had high school level of education and 27 (28.13 %) were not working currently. 58 (60.42 %) participants were married, 17 was unmarried, 16 was widowed and 6 got divorced. Only 18 was having health insurance and also 55.21% of the study participants are on financial burden to

meet their treatment expenses, majority of the participants are coming from join family in rural area (Table. 1).

It was observed that most of the participants was undergoing maintenance haemodialysis  $\geq 2$  year and majority of them are on weekly  $\geq 3$  sessions of dialysis (Table. 2).

**Table 1: Sociodemographic characteristics of the participants**

Parameters	Total (n=96)	Percentage
<b>Age</b>		
21 to 30 Year	5	5.2
31 to 40 Year	15	15.6
41 to 50 Year	27	28.1
51 to 60 Year	29	30.2
61 to 70 Year	13	15.5
Above 70 Year	7	7.3
<b>Gender</b>		
Male	55	57.29
Female	41	42.71
<b>Place of Residence</b>		
Urban	31	32.3
Rural	65	67.7
<b>Education</b>		
Illiterate	3	3.12
Primary School	11	11.45
Middle School	18	18.75
High school	33	34.37
Pre-University/Diploma	14	14.58
Degree	13	13.54
Professional Degree	4	4.16
<b>Occupational Status</b>		
Employed	63	65.63
Unemployed	27	28.13
Retired with Pension	6	6.25

**Table 2: Frequency and duration of haemodialysis**

Variables	Total (n=96)	Percentage
<b>Duration on HD treatment</b>		
< 2 Year	42	43.75
$\geq 2$ Year	54	56.25
<b>Frequency of HD session</b>		
< 3 times per week	34	35.42
$\geq 3$ times per week	62	64.58

All participants had some other comorbidities also, majority 59(61.46%) were suffering from hypertension and 32 (33.33%) had diabetes mellitus, 29(30.21%) had dyslipidaemia, 8 (8.33 %) had history of cardiovascular disease and 1(1.04%) had history of cancer (Table. 3).

**Table 3: Distribution of comorbidities according to comorbidities**

Other Comorbidity	Frequency (n=96)	Percentage (%)
Diabetes Mellitus	32	33.33
Hypertension	59	61.46
Dyslipidaemia	29	30.21
Cardiovascular Disorder	8	8.33
Thyroid related disorders	12	12.5
Cancer	1	1.04

It was observed that the overall QOL is adequate and the mean QOL Score of all the four domains of health and overall QOL is significant difference, and which is statistically significant with a p-value >0.01 (Table. 4).

**Table 4: Comparison of QOL with depression status**

Variables	Presence of depression as per BDI Score		P-Value
	Without depression (n=59)	With depression (n=37)	
	(Mean ± SD)	(Mean ± SD)	
Overall QOL	83.08 + 8.93	71.56 + 10.37	<0.001
Physical Health Domain	54.37 + 6.31	39.31 + 5.81	<0.001
Psychological Health Domain	57.58 + 8.13	41.23 + 7.22	<0.001
Social Relationship Domain	66.87 + 7.82	50.23 + 7.54	<0.001
Environmental Domain	68.38 + 9.29	52.73 + 8.16	<0.001

## 4 Discussion

In this present study the prevalence of depression was found to be 38.54%, a systematic review and meta-analysis done globally to find the depression among dialysis patients with 65 articles involving 80932 patients reported 26.5% prevalence of depression among haemodialysis patients <sup>10</sup> this difference could be due to diverse populations involved in the SRMA and other temporal variations.

However, findings of our study fall close to the prevalence reported in neighbouring countries Nepal and China which is 41% and 45.1% respectively in cross sectional studies <sup>11, 12</sup>.

It was observed in our study that the mean overall QOL score and QOL Score of each domain was showing significant difference all of those finding was showing strong statistical significance, with a p-value less than 0.001, which was very close the similar finding in cross sectional study in kerala state, India with mean QOL score for psychological health domain of 41.07±12.30 <sup>13</sup>. Preeti Gudlavally, *et al.*, conducted a cross-sectional study and reported significant strong negative correlation-ship between the depression and the physical (r=-0.651, P 0.001) and psychological (r=-0.684, P 0.001) domains of quality of life and this find was similar to ours <sup>14</sup>.

The major comorbidity in this current study was hypertension with a proportion of 61.46%, however in a systematic review and meta-analysis done by Motedayen, *et al.* reported by reviewing 35 articles the prevalence of hypertension among haemodialysis patients was 35.01% which significantly low when compared to our study, this difference could be due to diverse population, ethnicity and other temporal variations <sup>15</sup>.

It was observed that the majority (56.25%) of the participants of this study was been undergoing haemodialysis since more than 2 years and also most of them (64.58%) are undergoing ≥ 3 HD sessions per week which was found to be close to findings of a cross-sectional study conducted in western India by Shah DD, *et al.*, in which they reported a mean duration of 36 month of haemodialysis with majority undergoing twice a week session of haemodialysis <sup>16</sup>.

S. Ramesh, *et al.*, conducted a cross-sectional study in neighbouring state kerala reported that 39.1% were having insurance claims and 63.6% were not able to meet the treatment expenses for haemodialysis which is close to our finding that 61.46% were not able to meet the treatment expenses however only 18.75% of the participants were only having an insurance policy in this study <sup>17</sup>.

### 4.1 Limitations

Since it was a single centre cross sectional study with relatively less sample size it may affect the generalizability of the findings to broader population of patients on haemodialysis and potential confounding factors were not extensively controlled,

which we are planning to include in the future expansion of the study at multicentre level.

## 5 Conclusion

Our current study highlights high prevalence of depression among haemodialysis patients and its association with quality of life. The study helps highlight an important need: regular psychological assessment and preventive intervention in these patients. However, for now, reducing their 'suffering': helping improve the mental well-being of these patients would be a good start. Due to the cross-sectional nature of the study, longitudinal studies are needed to ascertain causality and provide insight over time. Moreover, providing holistic care requires

a multidisciplinary model that encompasses nephrologists, psychologists, and social workers. Potentially modifiable factors such as social support and coping mechanisms may help improve patients' quality of life overall.

## 6 Declaration

**Ethics approval and consent to participate:** Ethics clearance was granted by the Institutional Ethics Committee of the Sri Siddhartha Medical College, Tumkur, Karnataka, India (Reference No: SSMC/MED/IEC-105/March-2024). Written informed consent was taken from the participants before collecting data. Confidentiality and privacy were maintained.

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