# Depression Among Dialysis Patients

*Attending a Tertiary Care Hospital in Kerala, Southern India*

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*Identification and treatment of depression in chronic kidney disease (CKD) is important, since it can impair recovery, treatment, self-management, and quality of life. One hundred and twenty-one people undergoing hemodialysis in a tertiary care center in southern India were included in this study to assess depression in this population. Depression was evaluated using the Beck Depression Inventory (BDI). Among the patients, 33 (27.3%) were suffering from mild depression, 49 (40.5%) were suffering from moderate depression, and 19 (15.7%) had severe depression. Lower educational status [OR 3.77 (95% CI 1.34-10.63)], longer duration of dialysis [OR 5.75 (95% CI 1.79-18.44)], and hospitalization for indications other than dialysis in the last year [OR 3.88 (95% CI 1.34-11.27)] were associated with higher depression scores. It is important that all patients on routine hemodialysis be screened for signs and symptoms of depression, and this study contributes an international perspective to this important psychosocial determinant of patient outcomes.*

## INTRODUCTION

Around the world, diseases of the kidney and urinary tract are responsible for approximately 0.7 million deaths every year (World Health Organization (WHO), 2008). It has been estimated that the prevalence of end-stage renal disease (ESRD) will rise over the coming decades, driven by aging population, and increasing prevalence of diabetes mellitus and hypertension (Reikes, 2000). The exact number of ESRD patients needing dialysis or renal transplantation in India is not known. However, the prevalence of chronic kidney disease (CKD) in this country ranges from 0.7% to 1.4%, and the incidence of ESRD is estimated to be 180 to 200 per million population (Rajapurkar & Dabhi, 2010).

Depression has been identified as the primary mental health problem among dialysis patients, with a 2 – 10 times higher prevalence, compared to the general population (Watnick, Kirvin, & Mahnensmith, 2003). Identification and treatment of depression during the early stages of CKD is important, since depression can impair recovery, result in poor treatment adherence, and worsen patient quality of life and mental health status (Saravanan, 2009). Studies have investigated the relationship between depressive symptoms in ESRD patients and demographic and socioeconomic variables, however there is a lack of such studies about patient depression in India.

In India, hemodialysis is the predominant ESRD treatment regime, and is provided in private hospitals. Patients are responsible for the dialysis cost (in India, 60% of total healthcare expenditures are paid out of pocket). The average hemodialysis cost in India ranges between 1200 and 2000 rupees per treatment (about 17 to 29 U.S. dollars). Dialysis is usually offered three times a week. However, if patients cannot afford this frequency, they may receive 2 longer hemodialysis treatments weekly.

60% of total health expenditure in India was paid by patients from their own pockets. This study was conducted to estimate the prevalence of depressive symptoms among hemodialysis patients, and its relationship with clinical, demographic, and socioeconomic characteristics in a tertiary care center in Kerala, southern India.

## MATERIALS AND METHODS

This was a cross-sectional study conducted in a tertiary care private hospital in Kollam district, Kerala. The hospital has 850 beds, with all specialties and super-specialty departments, and has an average outpatient attendance of 1300 patients per day. The dialysis unit in this hospital opened in 2009 with 15 beds.

The current study was conducted among the patients attending the hospital for dialysis for more than 3 months consecutively (*N* = 121). Seven patients were not included due to reasons like hearing loss (2) and serious illness (5). Data was collected using a structured and pilot-tested questionnaire created by the study team, and by verbal interviews with patients. Interviews were conducted by the investigators, and each interview lasted for about 20 minutes. Informed consent for this study was obtained from the participants prior to the surveys. Human subject approval for the study was obtained from the Institutional Review Board of Travancore Medical College, Kollam.

Depression was evaluated using the Beck Depression Inventory (BDI). It is a validated screening tool to detect

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depression with sensitivity and specificity rates of more than 90% (Sharp & Lipsky, 2002). The instrument has been used for the assessment of depression in patients with CKD (Andrade & Sesso, 2012). Grading of depression was based on the score levels: mild depression (14 – 19), moderate depression (20 – 28), and severe depression (29 – 63).

Socioeconomic status was evaluated using revised Kuppuswamy's Socioeconomic Status Scale, which takes into consideration education, occupation, and monthly income (Oberoi, 2015). Grading of socioeconomic status was based on score levels: upper class (≥ 26), middle class (11 – 25), and lower class (≤ 10). We also measured patients' family status. "Joint family" is defined as a type of extended family comprised of parents, their children, children's spouses, and offspring in one household, while "nuclear family" is defined as a social unit comprised of two parents and their children.

Data was entered into a Microsoft Excel sheet and analyzed using SPSS Version 20. Depression was dichotomized with "none" and "mild" as one group, and "moderate" and "severe" as the depressed group. Chi-square and odds ratios were used to determine factors associated with depression in this population. *P* value less than 0.05 was considered statistically significant. The characteristics were entered into a logistic regression model, and adjusted odds ratios were calculated.

**RESULTS**

One hundred and twenty-one patients were included in the study. Of the study subjects, 78 (64.5%) were male. The mean age of the dialysis patients was 52.89 ±11.02 years. Of the study subjects, 67 (55.4 %) were 36 – 55 years old. Among patients, 57 (47.1%) were unskilled workers. Eighty-eight (72.7%) of the respondents were living in nuclear families. The majority (77.7%) of the study population belonged to middle socioeconomic status class. Sociodemographic characteristics of the study subjects can be found in **Table 1**.

Among the study subjects, 77 (63.6%) patients received dialysis twice weekly. More than a third of the sample (40.4%) had diabetes mellitus. Additional comorbidities were anemia (*n* = 52, 42.9%), peripheral neuropathy (*n* = 13, 10.8%), and diabetic retinopathy (*n* = 11, 9.1%). The majority of respondents (*n* = 95, 78.5%) were on dialysis less than 5 years. Only 3 patients were on anti-depressants. A majority of the sample (*n* = 96, 79.3%) had some kind of insurance coverage that covered their dialysis costs, and the rest were personally paying for their treatments.

Out of the 121 dialysis patients, a majority of them (*n* = 101, 83.5%) were depressed according to the BDI scale. Among these patients, 34 (28.1%) had mild depression, 48 (39.7%) had moderate depression, and 19 (15.7%) had severe depression. Among those who had not completed high school education, 56 (63.6%) had significantly higher scores on the depression scale (*p* = 0.003). Among those who have been on dialysis more than five years or more, 73.1% were depressed, compared to the 50.5% of patients who have been on dialysis

less than 5 years and experiencing depression (*p* = 0.032). In the multivariate analysis of the study findings, lower educational status [OR 3.77(95% CI 1.34-10.63)], longer duration of dialysis [OR 5.75 (95% CI 1.79-18.44)], and hospitalization for reasons other than dialysis in last year [OR 3.88 (95% CI 1.34-11.27)] were associated with higher depression scores. The results of univariate and multivariate analysis are outlined in **Table 2**.

### Table 1. Sociodemographic Characteristics of Study Population

| Characteristic | Frequency | Percentage |
| --- | --- | --- |
| **Age group** | | |
| 15 – 35 | 6 | 5.0 |
| 36 – 55 | 67 | 55.4 |
| 56 – 75 | 45 | 37.2 |
| >75 | 3 | 2.4 |
| | | |
| **Gender** | | |
| Male | 78 | 64.5 |
| Female | 43 | 35.5 |
| | | |
| **Type of Family** | | |
| Joint | 33 | 27.3 |
| Nuclear | 88 | 72.7 |
| | | |
| **Education** | | |
| Primary | 33 | 27.3 |
| High school | 55 | 45.5 |
| Higher secondary | 14 | 11.6 |
| Graduate | 12 | 9.9 |
| Professional | 7 | 5.7 |
| | | |
| **Economic Status** | | |
| Lower | 8 | 6.6 |
| Middle | 94 | 77.7 |
| Upper | 19 | 15.7 |
| | | |
| **Occupation** | | |
| Skilled | 36 | 29.7 |
| Unskilled | 57 | 47.1 |
| Clerical | 3 | 2.5 |
| Unemployed | 25 | 20.7 |

**Table 2.** Analysis of Factors Associated with Depression Among Study Subjects    *N* = 121

| Characteristics | BDI Score | | Chi Square | Odds Ratio | Adjusted OR |
|---|---|---|---|---|---|
| | Depression ≥ 20 | No Depression | p Value | (95% CI) | (95% CI) |
| **Age** | | | | | |
| > 50 years | 46 (59.7%) | 31 (40.3%) | 0.255 | 1.62 | 1.59 |
| < 50 years | 21 (47.7%) | 23 (52.3%) | | (0.77-3.42) | (0.76-3.32) |
| **Gender** | | | | | |
| Male | 42 (53.8%) | 36 (46.2%) | 0.482 | 1.31 | 1.24 |
| Female | 26 (60.4%) | 17 (39.6%) | | (0.61-2.79) | (0.54-2.68) |
| **SES** | | | | | |
| Lower SES | 60 (58.8%) | 42 (41.2%) | 0.085 | 2.44 | 1.56 |
| Higher SES | 7 (36.8%) | 12 (63.2%) | | (0.89-6.73) | (0.43-5.64) |
| **Education** | | | | | |
| High school | 56 (63.6%) | 32 (36.4%) | 0.003 | 3.50 | 3.77* |
| > High school | 11 (33.3%) | 22 (66.7%) | | (1.50-8.14) | (1.34-10.63) |
| **Type of family** | | | | | |
| Nuclear | 43 (48.9%) | 45 (51.1%) | 0.015 | 0.35 | 0.28* |
| Joint | 24 (72.7%) | 9 (27.3%) | | (0.15-0.85) | (0.09-0.81) |
| **Time on dialysis** | | | | | |
| ≥ 5 Years | 19 (73.1%) | 7 (26.9%) | | 2.65 | 5.75* |
| < 5 Years | 48 (50.5%) | 47 (49.5%) | 0.032 | (1.02-6.90) | (1.79-18.44) |
| **Insurance status** | | | | | |
| Insurance | 56 (58.3%) | 40 (41.7%) | 0.145 | 1.78 | 2.01 |
| No insurance | 11 (44.0%) | 14 (56.0%) | | (0.73-4.33) | (0.70-5.76) |
| **Hospitalization other than dialysis** | | | | | |
| Yes | 25 (73.5%) | 9 (26.5%) | 0.10 | 2.97 | 3.88* |
| No | 42 (48.3%) | 45 (51.7%) | | (1.24-7.10) | (1.34-11.27) |

*significant < .05

## DISCUSSION

In this study we found a very high percentage (83.5%) of depression among the patients, with 15.7% of study subjects having severe depression. In the multivariate analyses, lower educational status, more years on dialysis, and hospitalization for reasons other than dialysis in the last year were associated with higher depression scores.

The prevalence of depressive symptoms among dialysis patients in the current study was higher than previously reported in other states in India. In the The Dialysis Outcomes and Practice Patterns Study (DOPPS) done among 9382 patients randomly selected from dialysis centers in 12 countries outside India, 43% of the patients were depressed (Lopes, Albert, Young, Satayathum, Pisoni, & Andreucci, 2004). In a study done in Mysore, a city in southern India, 65% of ESRD patients were depressed (Sanathan, Menon, Alla, Madhuri, Shetty, & Ram, 2014). Cohen and colleagues reported prevalence of depression among dialysis patients in the United States as 45% (Cohen, Norris, Acquaviva, Peterson, & Kimmel, 2007). These differences might be due to the variations in the assessment of depression, as well as the location of the patients. All these studies highlight that depressive symptoms need to be studied and incorporated into assessment and treatment of ESRD patients. Accordingly in the United States, this is now mandated for all dialysis units.

In our study, a significant association was observed between depression and lower educational status. A similar finding was observed in another study done by Sanathan and colleagues (Sanathan, Menon, Alla, Madhuri, Shetty, & Ram, 2014). Many studies have reported that the period after initial diagnosis of ESRD, and the first year after initiation of HD, is associated with a greater risk of developing depression (Chen, Tsai, Hsu, Wu, Sun, & Chou, 2015; Sanathan, Menon, Alla, Madhuri, Shetty, & Ram, 2014). This is in contrast to what we observed, with greater depression in patients who were on dialysis longer. More research is needed to identify the risk factors for depression in dialysis patients in India. Dialysis social workers in India can help patients with their depression and work with dialysis teams to help improve patient outcomes regarding depression and its effects.

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