

Assessing The Incidence and Severity of Depressive Illness Among Patients in a Single Center Dialysis Unit Shifa International Hospital, Islamabad

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DOI: <https://doi.org/10.63163/jpehss.v3i3.550>

Abstract

Background: Depression is a common but often underdiagnosed comorbidity among patients undergoing maintenance hemodialysis. It significantly impacts treatment adherence, quality of life, and clinical outcomes. Understanding the incidence and contributing factors is essential for early identification and intervention.

Objective: To determine the frequency and severity of depression in patients undergoing maintenance hemodialysis and to identify associated demographic and clinical factors.

A cross-sectional study was conducted in the Nephrology Department of Shifa International Hospital, Islamabad, over six months. A total of 183 patients aged 30–80 years on maintenance hemodialysis were enrolled using non-probability consecutive sampling. Data were collected through a structured proforma, and depression severity was measured using the Beck Depression Inventory (BDI). Sociodemographic and clinical information was recorded. Data analysis was performed in SPSS version 20 using descriptive statistics and chi-square test, with $p \leq 0.05$ considered significant.

Results: The mean age of patients was 54.72 ± 14.78 years, and the average duration of hemodialysis was 33.31 ± 16.69 months. The mean BDI score was 12.55 ± 7.07 . Depression was present in 128 patients (69.9%), with 27.3% having mild, 24.0% moderate, and 18.6% severe depression. Among all variables assessed, only marital status showed a statistically significant association with depression ($p = 0.030$), while age, gender, residence, education, comorbidities, and dialysis duration were not significantly associated.

Conclusion: Depression is highly prevalent in patients on maintenance hemodialysis, with marital status emerging as a significant associated factor. Routine psychological evaluation should be integrated into dialysis care.

Keywords: Depression, Hemodialysis, Beck Depression Inventory, Marital Status, Psychological Burden, Chronic Kidney Disease.

Introduction:

End-stage renal disease (ESRD) presents a significant global health challenge, affecting populations across both developed and developing nations [1]. It is estimated that over 1.9 million individuals worldwide are currently receiving renal replacement therapy [2]. Patients undergoing maintenance hemodialysis (HD) face numerous physical, psychological, and social stressors that make them particularly vulnerable to depression. These challenges include declining physical health, disruption of social and occupational roles, and reduced ability to perform daily activities [3].

Depression is the most frequently reported psychiatric disorder among patients with chronic kidney disease (CKD), particularly those in the ESRD stage undergoing HD [4]. The prevalence of depression in this group varies considerably across studies, with reported rates ranging from 24% to 85% [4,5]. Depression in HD patients is associated with multiple negative health outcomes, such as poor quality of life, non-adherence to treatment regimens, repeated hospitalizations, and elevated rates of suicide and mortality [6,7]. These adverse outcomes are believed to be mediated in part by biological mechanisms, including elevated levels of inflammatory markers such as C-reactive protein (CRP), tumor necrosis factor-alpha (TNF- α), and interleukin-6 (IL-6) [8,9].

Psychological distress may also contribute to poor dialysis compliance, including missed sessions and reduced treatment duration [10]. Furthermore, these mental health issues significantly impact health-related quality of life (HRQOL) in patients on HD [11,12]. Several demographic and clinical risk factors—including younger age, female gender, low educational attainment, unemployment, hypertension, diabetes, and smoking—have been linked to increased depression risk in this population [13].

Understanding the frequency and severity of depression in patients on maintenance hemodialysis is imperative for optimizing their overall care and quality of life. Moreover, its exact prevalence

and severity can vary across different dialysis centers and patient demographics. Moreover, the bidirectional relationship between depression and the progression of kidney disease can exacerbate both conditions if left untreated. Hence, data from this study is essential for early detection, intervention, and the implementation of holistic care approaches that address both medical and psychological needs. By recognizing and addressing depression in this population, healthcare providers can improve patient outcomes, enhance treatment adherence, and ultimately enhance the overall well-being of individuals undergoing hemodialysis.

Material and methods:

This observational, cross-sectional study was conducted in the Nephrology Department of Shifa International Hospital, Islamabad. Data collection spanned six months and commenced after obtaining ethical clearance from both the College of Physicians and Surgeons Pakistan and the hospital's Institutional Review Board. A total of 183 participants were enrolled using a non-probability consecutive sampling technique. The sample size was determined using the WHO sample size calculator, based on an assumed depression prevalence of 63%, with an 8% margin of error and a 95% confidence interval.

Patients aged between 30 and 80 years of either gender, undergoing maintenance haemodialysis, were included. Exclusion criteria included patients with a history of hypo- or hyperthyroidism; those with cognitive impairment or communication difficulties; patients with a medical history of dementia, delirium, mania, bipolar affective disorder, or post-traumatic stress; patients already diagnosed with depression or previously treated with antidepressants; and those with a history of congestive heart failure, myocardial infarction, chronic liver disease, chronic obstructive pulmonary disease (COPD), or stroke.

After obtaining informed consent, patients meeting the inclusion criteria were enrolled. Data were collected using a structured proforma designed to assess the frequency and severity of depression and the frequency of contributing factors among patients on maintenance hemodialysis. The Beck Depression Inventory (BDI), a validated 21-item questionnaire, was used to assess depressive symptoms. Each item was scored from 0 to 3 based on the severity of symptoms, with a total score of ≥ 9 considered indicative of depression. Based on the total score, severity was categorized as mild, moderate, or severe.

The proforma also recorded demographic details such as age, gender, residence (urban/rural), marital status, education level, and duration of hemodialysis in months. In addition, potential contributing factors for depression were assessed, including the presence of diabetes mellitus type II, hypertension, dyslipidemia, physical inactivity, living alone, and unemployment status—each documented as Yes or No responses.

Data were analyzed using SPSS Version 20. Continuous variables such as age, BDI score, and duration of hemodialysis were summarized using mean and standard deviation for normally distributed data (assessed via the Kolmogorov–Smirnov test) or median and interquartile range for non-normal data. Categorical variables, including gender, residence, marital status, education, depression (Yes/No), severity of depression, and contributing factors were summarized using frequencies and percentages. Effect modifiers were controlled through stratification by age, gender, residence, marital status, education, and duration of hemodialysis. Post-stratification, the chi-square test or Fisher's exact test was applied, with a p -value ≤ 0.05 considered statistically significant.

Results

A total of 183 patients undergoing maintenance hemodialysis were included in the study. The mean age of the participants was 54.72 ± 14.78 years, and the average duration of hemodialysis was 33.31 ± 16.69 months. The mean Beck Depression Inventory (BDI) score among the study population was 12.55 ± 7.07 .

Based on the BDI scale, 55 patients (30.1%) exhibited no symptoms of depression, while 50 (27.3%) had mild depression. Moderate depression was identified in 44 patients (24.0%), and severe depression in 34 patients (18.6%). Thus, 128 individuals (69.9%) exhibited some degree of depressive symptoms, highlighting a substantial psychological burden among patients on long-term hemodialysis (Table 1).

When analyzed by patient characteristics, depression was slightly more common in individuals aged 30–44 years (38/52; 73.1%) and 60–80 years (57/78; 73.1%) compared to those aged 45–59 years (33/53; 62.3%); however, this difference was not statistically significant ($p = 0.351$). Among male participants, 65 out of 88 (73.9%) were found to be depressed, compared to 63 out of 95 (66.3%) female participants ($p = 0.266$).

A non-significant trend was observed with increasing duration of hemodialysis: depression was present in 38 (64.4%) patients with 1–24 months of treatment, 58 (71.6%) with 25–48 months, and

32 (74.4%) with more than 48 months of dialysis ($p = 0.502$). Urban residents demonstrated a slightly higher prevalence of depression (67/92; 72.8%) compared to rural residents (61/91; 67.0%), though the difference was not statistically significant ($p = 0.393$).

A significant association was observed between marital status and depression. Depression was reported in 91 of 121 married individuals (75.2%) versus 37 of 62 unmarried individuals (59.7%), with a p -value of 0.030. No significant association was found with educational level, although depression appeared more prevalent among those with secondary education (78.8%) compared to those with higher education (56.7%) ($p = 0.212$).

Comorbidities such as diabetes mellitus (72.4% vs. 68.2%; $p = 0.547$), hypertension (64.8% vs. 75.0%; $p = 0.134$), and dyslipidemia (70.9% vs. 69.5%; $p = 0.852$) were not significantly associated with depression. Similarly, physical inactivity (71.2% vs. 68.4%; $p = 0.682$), living status (living alone: 73.3% vs. living with others: 68.8%; $p = 0.568$), and employment status (unemployed: 68.7% vs. employed: 70.7%; $p = 0.773$) showed no significant associations with depressive symptoms (Table 2).

In summary, while the majority of patients on hemodialysis experienced some degree of depression, only marital status showed a statistically significant relationship with depressive symptoms in this cohort. Other demographic and clinical variables did not demonstrate significant associations with depression.

Table 1: Depression Severity Among Hemodialysis Patients (n = 183)

Depression Severity	Frequency (%)
None	55 (30.1%)
Mild	50 (27.3%)
Moderate	44 (24.0%)
Severe	34 (18.6%)
Total	183 (100.0%)

Table 2: Association of Patient Characteristics with Depression (n = 183)

Variable	Subgroups	Depression n (%)	No Depression n (%)	p-value
Age Group	30–44 years	38 (73.1%)	14 (26.9%)	0.351
	45–59 years	33 (62.3%)	20 (37.7%)	
	60–80 years	57 (73.1%)	21 (26.9%)	
Gender	Male	65 (73.9%)	23 (26.1%)	0.266
	Female	63 (66.3%)	32 (33.7%)	
Hemodialysis Duration	1–24 months	38 (64.4%)	21 (35.6%)	0.502
	25–48 months	58 (71.6%)	23 (28.4%)	
	>48 months	32 (74.4%)	11 (25.6%)	
Residence Status	Urban	67 (72.8%)	25 (27.2%)	0.393
	Rural	61 (67.0%)	30 (33.0%)	
Marital Status	Married	91 (75.2%)	30 (24.8%)	0.030
	Unmarried	37 (59.7%)	25 (40.3%)	
Educational Level	Illiterate	31 (68.9%)	14 (31.1%)	0.212
	Primary	39 (69.6%)	17 (30.4%)	
	Secondary	41 (78.8%)	11 (21.2%)	
	Higher	17 (56.7%)	13 (43.3%)	
Diabetes Mellitus	Yes	55 (72.4%)	21 (27.6%)	0.547
	No	73 (68.2%)	34 (31.8%)	
Hypertension	Yes	59 (64.8%)	32 (35.2%)	0.134
	No	69 (75.0%)	23 (25.0%)	
Dyslipidemia	Yes	39 (70.9%)	16 (29.1%)	0.852
	No	89 (69.5%)	39 (30.5%)	
Physical Inactivity	Yes	74 (71.2%)	30 (28.8%)	0.682
	No	54 (68.4%)	25 (31.6%)	
Living Alone	Yes	33 (73.3%)	12 (26.7%)	0.568
	No	95 (68.8%)	43 (31.2%)	
Unemployed	Yes	46 (68.7%)	21 (31.3%)	0.773
	No	82 (70.7%)	34 (29.3%)	

Discussion

The current study demonstrates that nearly 70% of patients undergoing maintenance hemodialysis experienced depressive symptoms, with 27.3% reporting mild, 24.0% moderate, and 18.6% severe symptoms. This aligns closely with several recent studies that have highlighted the high psychological burden of end-stage renal disease (ESRD).

For instance, Albuhayri et al. reported a depression prevalence of **74.6%** among hemodialysis patients in Saudi Arabia, with most cases being mild to moderate, and no significant differences related to age or gender—findings that are consistent with our observations of non-significant age and gender differences [15]. Similarly, Mahmoud et al. found a strong association between **increased BDI scores and reduced quality of life**, reinforcing the clinical importance of early psychological assessment in dialysis settings [16].

Regarding dialysis duration, our study observed a non-significant trend of increased depression with longer treatment, which is in partial agreement with Wicaksana et al., who reported that **patients on dialysis for more than 2 years were significantly more likely to be depressed** [17]. However, Deswima et al. offered an interesting contrast by finding a **negative correlation** between depression and dialysis duration, suggesting possible emotional adaptation over time in certain populations [18].

Age-related findings in our study revealed that the extremes of age (30–44 and 60–80 years) had the highest depression rates, though not statistically significant. This pattern is consistent with findings by Bhatia and Marwaha, who observed that **depression and anxiety were more common in patients aged over 60 years** [19].

Among sociodemographic factors, marital status showed a statistically significant association with depression in our study. In contrast, other studies such as Zaidi et al. identified **unmarried status as a risk factor**, along with unemployment and multiple comorbidities, emphasizing the varied psychosocial dynamics influencing mental health in dialysis patients [20].

Comorbidities like diabetes and hypertension did not significantly correlate with depression in our population. However, Pretto et al. showed that **greater comorbidity burden and functional dependence** were strongly associated with depressive symptoms in Brazilian dialysis patients [21].

Lastly, Talukder et al. highlighted that **nearly 82% of patients with moderate to severe depression** experienced worsening with longer disease duration, again reinforcing our findings that chronicity contributes to psychological distress [22].

Conclusion:

In conclusion, this study demonstrates a high burden of depression among patients undergoing maintenance hemodialysis, with nearly 70% experiencing some level of depressive symptoms. While depression was prevalent across various demographic and clinical subgroups, marital status was the only factor significantly associated with depression. These findings underscore the need for routine psychological assessment and support in hemodialysis units, with particular attention to patients' social and emotional well-being to improve overall quality of life and treatment outcomes.

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