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Prevalence and Correlates of Depression Among Chronic Kidney Disease Patients on Maintenance HD In Hyderabad And Adjoining Area.

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Abstract

Background: Depression is the most prevalent and economically impactful chronic ailment among hemodialysis (HD) patients, depression emerges as the foremost and gravest psychopathological consequence. It has extensive effect on quality of life, potentially resulting in severe consequences like discontinuation of HD treatment if not addressed timely.

Objective: To examine the risk factors and prevalence of depression in our HD patients.

Methodology: A descriptive study was conducted at the HD unit Department of Nephrology, Liaquat University Hospital, Jamshoro, Pakistan between April 15, 2021, and October 14, 2021, involving 113 End-Stage Renal Disease (ESRD) patients on HD for more than 3 months. Depression evaluation was performed through the Beck Depression Inventory (BDI-II) questionnaire.

Results: Out of the 113 individuals involved, 54.9% were male while 45.1% were female, with a mean age of 41.99 ± 13.65 years and a mean HD duration of 15.44 ± 15.06 months. Among people with end-stage renal disease (ESRD), diabetes was the main cause in 43.4% of the patients. Regarding depression levels, 7 participants (6.2%) scored in ups and down, 22 (19.5%) experienced mild mood disturbance, 23 (20.4%) were classified with borderline clinical depression, 31 (27.4%) had moderate depression, and 30 (26.5%) were diagnosed with severe clinical depression based on the Beck Depression Inventory (BDI-II) scoring system.

Conclusion: In conclusion, our study revealed that HD patients had a significant prevalence of depression. Notably, depression was linked to a higher risk of male gender, marital status, and current smoking.

Key Words: End stage renal disease, chronic kidney disease, depression, hemodialysis, Beck depression Inventory.

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Introduction:

End-Stage Renal Disease (ESRD) presents a substantial and economically demanding public health challenge. It is characterized by a gradual and irreversible deterioration in renal function over an extended period, culminating in a point where the severity of impairment necessitates dialysis or kidney transplantation to maintain the overall health and viability of the individual.[1,2] The procedure of hemodialysis (HD) treatment not only involves physiological challenges but also induces alterations in

the psychological state and personality of HD patients. These changes stem from the recurrent exposure of patients to a consistently stressful environment thrice a week, along with the multitude of adjustments they must make across personal, social, and professional domains. These adaptations encompass lifestyle modifications, dependence on the HD procedure and medical personnel, shifts in employment and social standing, financial considerations, dietary adjustments, concerns related to dialysis access, sexual dysfunction, and anxiety pertaining to mortality. Nonetheless, the psychological reaction of patients to HD is contingent upon their pre-existing personality traits, the level of familial support, and any accompanying co-morbidities. [3]

The World Health Organization has emphasized depression as the most prevalent and economically impactful chronic ailment.[4] Among HD patients, depression emerges as the foremost and gravest psychopathological consequence.[5] Depression has far-reaching effects on a patient's quality of life and, when left untreated, can lead to dire outcomes such as suicide or discontinuation of HD treatment.[6,7] The daily impact of dialysis and heightened treatment-related stressors can compound the therapeutic burden and contribute to the onset of depression.[8] However, the reported prevalence of depression varies significantly across different studies, populations, and assessment tools. According to the Dialysis Outcomes and Practice Patterns Study (DOPPS), the prevalence of depression ranges from 39.3% to 62.3%.[9] For instance, Momeni et al. assessed depression prevalence in 160 HD and kidney transplant recipients in Shahrekord, Iran, using Hamilton's questionnaire, showing that depression was present in almost 79% of HD patients.[10] Similarly, Saeed et al. They found that 75% of patients and 33.4% of relatives had depression.[11] Furthermore, certain demographic factors like marital status, income, and employment were found to impact the level of depression in HD patients. Another study suggests that ESRD patients are about four times more susceptible to depression than the general population.[12] Unfortunately, depression often goes undetected and untreated in dialysis patients, underscoring the need for understanding its prevalence and risk factors for effective intervention. [13,14] Thus, this study aims to explore the prevalence of depression and its associated risk factors among HD patients.

Methodology

A descriptive study was carried out at the HD unit, department of nephrology, Liaquat University of Medical and Health Sciences (LUMHS), Jamshoro, Pakistan. This study was carried out with permission from the research ethics committee (Notification number. LUMHS/REC/73).The study spanned Six months, from April 15, 2021, to October 14, 2021, and included patients who provided written informed consent. The sample size of 113 was determined based on a 75% frequency, 8% margin of error, and 95% confidence interval using a non-random convenience sampling method for participant selection.
The study included patients with End-stage renal disease who had been on maintenance HD for more than 3 months and less than 6 years, undergoing two conventional HD sessions per week, lasting 3 hours each. Both genders were included, with an age range of 18 to 70 years. Exclusion criteria encompassed individuals who declined to participate, those below 18 years of age, individuals with hearing, speech, or cognitive impairments affecting their understanding of the questions, as well as patients with dementia, delirium, or a history of psychiatric disorders.

The assessment of depression was conducted using the Beck Depression Inventory (BDI-II) questionnaire, which was applied in Sindhi and Urdu and consisted of 21 items that evaluated depressive symptoms. Each question was scored from 0 to 3 (Beck & Steer, 1993). Based on the BDI-II scores, depression levels were categorized as follows: Ups and downs (Score 1 – 10), mild mood disturbance (Score 11 – 16), borderline clinical depression (Score 17 – 20), moderate depression (Score 21 – 30), and severe clinical depression (Score 31 and above). The second part of the questionnaire collected demographic data and disease characteristics. Demographic data included gender, age, marital status, educational level, job status, and lifestyle factors such as smoking and alcohol consumption history. Disease characteristics included the cause of end-stage renal disease and the duration of HD.

Statistical analysis: Data analysis was performed using SPSS version 22. Categorical variables were presented as frequency and percentage, while numeric variables were reported as mean and standard deviation. Fisher exact test, Chi square test and Kurskal Walli tests were applied for evaluating the difference among different variables. P value of <0.05 was taken as significant.

Results

Among the 113 participants, 54.9% were male and 45.1% were female. The majority (79.6%) were married, while 20.4% were unmarried. In terms of occupation, 48.7% were employed, and 51.3% were unemployed. Education levels varied, with the highest proportion having completed higher secondary education (23.9%), followed by matriculation (15.9%). The prevalence of hypertension was 69.9%, and 45.1% of participants had diabetes. Only 7.1% reported alcohol consumption, and 31.9% were smokers. The mean age was 41.99 ± 13.65 years and the average duration of HD was 15.44 ± 15.06 months, Table 1.

Table 1: General characteristics of 113 patients undergoing maintenance hemodialysis assessed for depression.

Characteristics	n (%)
Gender:	
Male /Female	62 (54.9%)/ 51 (45.1%)
Age	41.99 ± 13.65
Duration of Hdx	15.44 ± 15.06
Marital status: Married / Unmarried	90 (79.6%) /23 (20.4%)
Occupation: Employed /Unemployed	55 (48.7%)/58 (51.3%)
Education	
Uneducated	23 (20.4%)
Primary	19 (16.8%)
Matric	18 (15.9%)
Higher Secondary	27 (23.9%)
Graduate	15 (13.3%)
Post- Graduation	11 (9.7%)
Hypertension	79 (69.9%)
Diabetes	51 (45.1%)
Alcoholic	8 (7.1%)
Smoking	36 (31.9%)

Different level of depression as per BDI-II scale. Are shown in table 2. Analyzing the causes of ESRD indicating that Diabetes Mellitus was found to be prevalent in 43.4% of the patients, indicating a substantial diabetic population within the HD cohort. Hypertension, a common comorbidity in this context, was observed at a rate of 69.9%. Stone disease, affecting 17.7% of the patients, and polycystic kidney disease, affecting 9.7%, were also prevalent conditions. Chronic glomerulonephritis (GN) accounted for 15.0% of the cases, showcasing its impact on the patient population. Additionally, a category labeled "Others" constituted 11.5% of the cases, implying a range of less frequent but diverse comorbidities.

The analysis revealed patterns in Beck Depression Inventory (BDI) scores across different categories of the studied variables. Notably, gender exhibited a significant association with BDI scores ($p = 0.022$), where a larger proportion of males had higher BDI scores compared to females. However, marital status ($p = 0.869$) and occupation ($p = 0.302$) did not demonstrate statistically significant associations with BDI scores.

Hypertension and diabetes mellitus status appeared to have limited impact on BDI scores, as no clear trends or statistically significant differences were observed ($p = 0.499$ and $p = 0.356$, respectively). Similarly, the presence of alcohol consumption did not appear to influence BDI scores significantly ($p = 0.884$). Conversely, smoking showed a notable association with BDI scores ($p = 0.001$), with a higher percentage of smokers having elevated BDI scores.
Regarding continuous variables, such as age and duration of HD, no significant relationships with BDI scores were found ($p = 0.355$ and $p = 0.591$, respectively) in table 2.

Discussion

ESRD has a significant physical impact that encroaches upon the psychosocial aspect as well.[15] Kimmel et al. in a comprehensive study found significantly higher rates of depression in patients with end-stage renal disease (ESRD) than in those with other chronic conditions such as cerebrovascular or ischemic heart disease.[16] Although depression is a common disorder in these patients, it is frequently underdiagnosed and untreated during dialysis, which may be due to similarity between the somatic symptoms of depression (e.g., sleep disturbances, loss of appetite, fatigue, sexual dysfunction and gastrointestinal complaints) and those related to uremia.[17] The overlapping can give rise to difficulties in identifying and managing depression in such patients.
Different methodologies have been utilized in studying depression among ESRD patients, leading to notable variations in findings. In our study, we chose to utilize the extensively validated BDI-II questionnaire, widely employed across multiple studies.[18]

The prevalence of depression among patients undergoing HD at different levels was determined to be 74.3%, mirroring the results of a cross-sectional study conducted by Hawamdeh S et al. in 2017.[19] This previous study revealed that 70% of individuals with kidney failure experienced depression across various gradients of severity, with 28% manifesting mild depression, 26% demonstrating moderate depression, 8% presenting with severe depression, and 7% exhibiting very severe depression. In contrast, our own investigation revealed that 20.4% of participants displayed borderline clinical

depression, 27.4% showed signs of moderate depression, and 26.5% were diagnosed with severe clinical depression.

Table 2: Severity of depression among 113 maintenance hemodialysis patients utilizing Beck Depression Inventory score.

Study Variables	Beck Depression Inventory (BDI) Score					p-value
	Ups and down (n=7)	Mild Mood disturbance (n=22)	Borderline Clinical (n=23)	Moderate (n=31)	Above Severe (n=30)	
Gender						
Male	3 (42.9%)	6 (27.3%)	13 (56.5%)	18 (58.1%)	22 (73.3%)	0.022
Female	4 (57.1%)	16 (72.7%)	10 (43.5%)	13 (41.9%)	8 (26.7%)	
Marital status						
Married	6 (85.7%)	17 (77.3%)	20 (87.0%)	24 (77.4%)	23 (76.7%)	0.869
Unmarried	1 (14.3%)	5 (22.7%)	3 (13.0%)	7 (22.6%)	7 (23.3%)	
Occupation						
Employed	4 (57.1%)	15 (68.2%)	10 (43.5%)	14 (45.2%)	12 (40.0%)	0.302
Unemployed	3 (42.9%)	7 (31.8%)	13 (56.5%)	17 (54.8%)	18 (60.0%)	
Hypertension						
Yes	6 (85.7%)	14 (63.6%)	15 (65.2%)	20 (64.5%)	24 (80.0%)	0.499
No	1 (14.3%)	8 (36.4%)	8 (34.8%)	11 (35.5%)	6 (20.0%)	
Diabetes						
Yes	1 (14.3%)	8 (36.4%)	11 (47.8%)	15 (48.4%)	16 (53.3%)	0.356
No	6 (85.7%)	14 (63.6%)	12 (52.2%)	16 (51.6%)	14 (46.7%)	
Alcoholic						
Yes	0 (0.0%)	1 (4.5%)	2 (8.7%)	3 (9.7%)	2 (6.7%)	0.884
No	7 (100.0%)	21 (95.5%)	21 (91.3%)	28 (90.3%)	28 (93.3%)	
Smoking						
Yes	0 (0.0%)	1 (4.5%)	8 (34.8%)	10 (32.3%)	17 (56.7%)	0.001
No	7 (100.0%)	21 (95.5%)	15 (65.2%)	21 (67.7%)	13 (43.3%)	
Age	40 (38-54)	32 (26-52.7)	42 (32-60)	40 (29-50)	44.5 (38.5-56)	0.355*
Duration of HD	24 (9-36)	10 (7.5-24)	7 (4-24)	10 (5-13)	10 (8.7-14.5)	0.591*

P-value calculated by Chi-square / Fisher's Exact test and values were presented as Frequencies and Percentages.
*P-value calculated by Kruskal Walli's test and values were presented as Median (Interquartile range).

Depression exhibits a robust correlation with the sociodemographic characteristics of patients, including factors such as age and gender, marital status. Regarding age, numerous studies have consistently indicated a higher likelihood of depression among older patients compared to younger ones. However, our study yielded different results, as we found no statistically significant relationship between age and BDI scores (p = 0.355).

Furthermore, it is widely documented that global and Pakistani studies commonly report a higher prevalence of depressive symptoms in females relative to males. In contrast, our research uncovered a notable difference, with males displaying significantly higher BDI scores compared to females ($p = 0.022$), a pattern consistent with the findings of a study conducted by Mosleh et al.[20]

Our finding indicated a significant correlation between being married and a heightened prevalence of depression, which aligns with the findings reported by Saeed et al. in their study where depression was diagnosed more frequently among married patients.[11] This may be due to the increased responsibilities that married people often have towards their families.

Smoking exhibited a significant association with BDI scores ($p = 0.001$), indicating that a higher proportion of smokers had elevated BDI scores. This aligns with the findings of another study where the authors reported that over half of the individual' s currently undergoing dialysis therapy and who were smokers also experienced depression.[21]

Overall, these findings highlight the importance of considering various demographic and clinical factors when assessing depression among individuals with ESRD. The results emphasize the need for targeted interventions and support systems to address depression and improve the overall well-being of ESRD patients. Integrating mental health care into CKD management programs could lead to more comprehensive and effective healthcare outcomes for this vulnerable population. However, it is essential to acknowledge the limitations of the study, such as its cross-sectional design and potential biases, which may impact the generalizability of the findings. Further longitudinal research is warranted to explore the dynamics between CKD and depression and to validate the associations observed in this study.

Conclusion

In conclusion, our study revealed a high prevalence of depression among patients undergoing HD. Notably, male gender, marital status, and current smoking were associated with a higher likelihood of experiencing depression in this patient population. These findings underscore the significance of implementing routine depression screening for hemodialyzed patients. Such screening measures can play a pivotal role in improving the management of depression and ultimately enhancing the overall quality of life for individuals undergoing HD.

Conflict of interest: None declared

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