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ASSESSMENT OF DEPRESSION SEVERITY AMONG HAEMODIALYSIS PATIENTS USING BDI SCALE

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ABSTRACT

The study delves into the often-overlooked aspect of depression in patients with chronic kidney disease (CKD) undergoing haemodialysis, a life-saving procedure for those with end-stage renal disease (ESRD). Dialysis, a crucial intervention when kidney fails to adequately remove waste and fluid, not only presents physical challenges but also contributes to psychological distress. Depression, a prevalent but underdiagnosed issue in CKD patients, poses additional risks to overall health and quality of life. With a focus on a public tertiary care hospital in India, where the prevalence of CKD is estimated to be 0.7% to 1.4%, this study aims to shed light on the prevalence of depression and its contributing factors. The results revealed a diverse spectrum of depression severity, ranging from mild to extreme and factors involved in. The World Health Organization's alarming statistics on kidney diseases globally, coupled with the rising incidence of ESRD, emphasize the urgency of understanding and addressing the mental health challenges faced by CKD patients. By attenuating the factors influencing the depression in the study population may improve the QoL of haemodialysis patients.

Keywords: Chronic Kidney Disease, Haemodialysis, Mental Health, Beck Depression Inventory (BDI).

Introduction

Dialysis is a procedure to remove waste products and excess fluid from the blood when the kidneys stop working properly. It often involves diverting blood to a machine to be cleaned. (1) The removal of unwanted small molecules such as salts, reducing agents, or dyes from larger macromolecules such as proteins, DNA, or polysaccharides. Dialysis is also commonly used for buffer exchange and drug binding studies.(2) You need dialysis if your kidneys no longer remove enough waste and fluid from your blood to keep you healthy. This usually happens when you have only 10 to 15 percent of your kidney function left. You may have symptoms such as nausea, vomiting, swelling, and fatigue. (3) In hemodialysis, a machine filters wastes, salts, and fluid from your blood when your kidneys are no longer healthy enough to do this work adequately. Hemodialysis is one way to treat advanced kidney failure and can help you carry on an active life despite failing kidneys. (4) Having kidney failure changes a lot of things, and that can contribute to feelings of depression and isolation. People may feel numb or fail to accept the reality of the situation. Anger, sadness, worry, and guilt are also common.

Depression has been identified as a complicating comorbid diagnosis in a variety of diseases. (1) The risk of clinical depression is often higher in individuals with serious medical illnesses, such as heart disease, cancer, stroke and diabetes. Depression has been associated with impaired recovery and increased mortality in many diseases. 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. Recently, depression in ESRD has been the focus of increased attention. (5) Depression is the most common disorder in hemodialysis patients and is the independent risk factor in these patients. The patients with chronic kidney disease hemodialysis is necessary for survival.(6) Depression is one of the most commonly occurring psychiatric problems in CKD patients. The research findings in India regarding mental health-related issues in CKD patients undergoing hemodialysis is limited. (7)

According to WHO, around the world, diseases of the kidney and urinary tract are responsible for approximately 0.7 million deaths every year. It has been estimated that the prevalence of end-stage renal disease (ESRD) will rise over the coming decades, driven by an aging population, and increasing prevalence of diabetes mellitus and hypertension. 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 populations. (8) The progressive increase in both the incidence and prevalence of ESRD patients throughout the world, the high mortality rate and the rising costs of providing care to patients with ESRD have focused research interest on that aspect of ESRD care which affect patient outcomes and are potentially amendable to modification to improve these outcomes.

Depression remains undiagnosed and untreated in CKD patients. Routine screening and diagnosis help in decreasing this burden and improving patient's quality of life. This study aims to determine the prevalence of depression in patients with CKD and the factors affecting it at a public tertiary care hospital. (7)

Materials and Methods

Study Design and Setting

This observational study was conducted to ascertain the prevalence of depression among hemodialysis patients in Vijayapura city. The research was carried out at a dedicated hemodialysis centre within the district, where patients received routine hemodialysis treatment. The study setting was chosen due to its accessibility and the concentration of hemodialysis patients.

Participants

The recruitment process began with the identification of eligible participants among the patients undergoing hemodialysis at the selected centre in Vijayapura city. Patients were approached during their routine hemodialysis treatment sessions by the investigator.

Inclusion criteria

- Patients undergoing hemodialysis
- >18 years of age

Exclusion criteria

- Malignancy
- Patients suffering from any psychiatric illness or taking any treatment
- Those who are intellectually unable to answer questionnaires and illiterates
- Those who refused to participate

Data Collection Instruments

To assess depression, the Beck Depression Inventory (BDI) was employed as a reliable and validated self-report questionnaire. This 21-item scale allowed for the quantitative measurement of the severity of depressive symptoms in the study participants.

The score range and their respective interpretation is listed as follows

- 1-10 - Normal
- 11-16 - Mild mood disturbance
- 17-20 - Borderline clinical depression
- 21-30 - Moderate depression
- 31-40 - Severe depression
- 40 - Extreme depression

In addition, the Epworth Sleepiness Scale was used to evaluate the participants' sleep patterns, recognizing the potential relationship between changes in sleep and depressive symptoms. An additional questionnaire was applied to assess general data (age, gender, marital state, address in urban or rural area, occupation, cause of CKD, comorbidities) and data related to the dialysis session (time on dialysis, interdialytic weight gain). Laboratory parameters were analyzed, such as hemoglobin, phosphorus, and albumin.

Data Collection Procedure

The sample size for this study was set at 70 participants to provide sufficient statistical power and a balanced representation of the target population with the help of a statistician. The primary data collection method involved face-to-face interviews, which were conducted by trained investigators at the hemodialysis centre. Patients were approached during their

scheduled treatment sessions, where the investigator explained the nature and purpose of the study. Informed consent was sought and obtained from patients who met the inclusion criteria and agreed to participate. The consent process included an assurance of confidentiality and the right to withdraw from the study at any point without facing negative consequences.

Data Analysis

The data collected were analyzed using appropriate statistical software, primarily SPSS. Descriptive statistics, including means, standard deviations, frequencies, and percentages, were employed to summarize the data. The prevalence of depression among the study participants was calculated to fulfil the research objectives. While the primary aim of the study was to determine the extent of depression, additional analyses were conducted to explore any potential correlations between depressions and sleep patterns.

Result

70 patients were enrolled during the study period and data was collected, the study population showed depression of mild mood disturbance (19%), borderline (11%), moderate depression (17%), severe depression (23%), extreme depression (21%) and the remaining (9%) subjects did not show depressive symptom **(Fig. 1).**

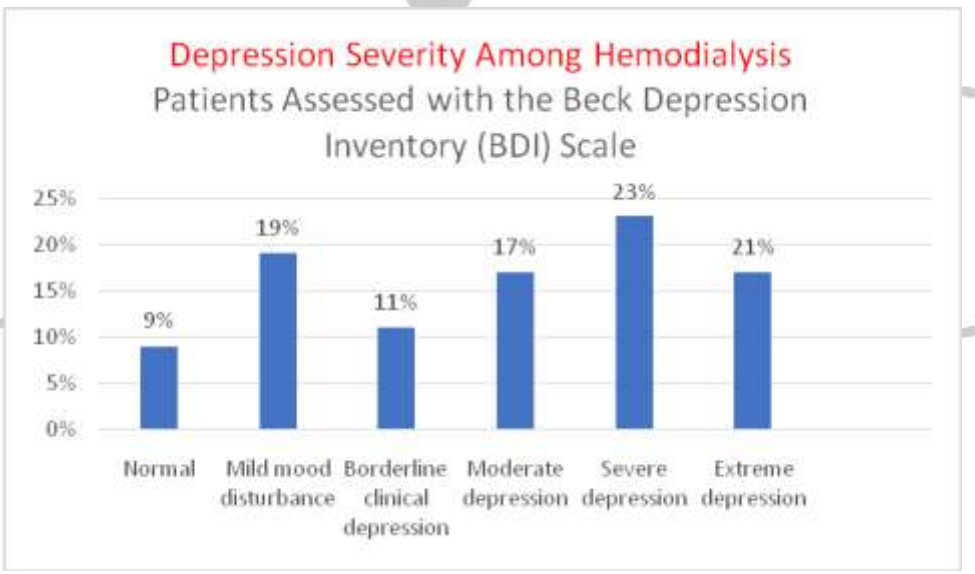

Fig. 1

The majority of patients, constituting 33% fall within the age group of 41 to 50 and followed with 23% within 51 to 60, together constitutes 56% of depression within the 41-60 age group (Table 1).

Table 1. Depression Severity Distribution among Hemodialysis Patients Based on Age.

Characteristics	No. of Patients	Depression Severity			Percentage (%)
Age		Non-Depression	Mild	Moderate-Severe	
10-20	02	1(1.5%)	-	1(1%)	03%
21-30	10	1(0.3%)	4(6%)	5(7%)	14%
31-40	13	4(6%)	3(4%)	6(9%)	19%
41-50	23	3(4%)	7(10%)	13(19%)	33%
51-60	16	7(10%)	5(10%)	4(6%)	23%
61-70	06	3(4%)	0%	3(4%)	8%

In examining depression levels among hemodialysis patients based on gender, the study found notable differences between male and female. Among the 41 male patients, 59% experienced some form of depression, with 24% exhibiting moderate to severe symptoms. In contrast, among the 29 female patients, 41% experienced depression, with 20% showing moderate to severe symptoms. These findings suggest a higher overall prevalence and severity of depression among male hemodialysis patients compared to their female counterparts. However, it should also be noted that number of female patients in our study was less than male patients. This finding aligns with existing literature indicating that gender can influence the experience and reporting of depressive symptoms and underscores the need for gender-sensitive approaches in addressing mental health in hemodialysis patients (Table 2).

Table 2. Depression Severity Distribution among Hemodialysis Patients Based on Gender.

Characteristics	No. of patients	Depression Severity			Percentage (%)
Gender		Non-Depression	Mild	Moderate-Severe	
Male	41	13(19%)	11(16%)	17(24%)	59%
Female	29	06(9%)	09(13%)	14(20%)	41%

The analysis of employment status among hemodialysis patients indicates that the majority, comprising 96% of the sample, are not currently working. Only 4% of patients are employed while undergoing hemodialysis treatment. This highlights a proportion of patients who may face challenges in maintaining employment while managing their health condition (Table 3).

Table 3. Employment Status of Hemodialysis Patients

Employment status	No of patients	Percentage (%)
Working	03	04%
Not working	67	96%

Weight status emerged as another significant factor associated with depression severity. The majority of patients had a normal weight (60%), but underweight patients constituted 21% of the sample. Intriguingly, underweight individuals exhibited a percentage of moderate to severe depression at 11%.

A larger proportion of patients were ungraduated (74%) compared to graduated patients (26%). and, ungraduated patients had a higher percentage of moderate to severe depression at 34%. Similarly, the majority of patients belonged to the lower economic status (57%), and this group had a higher percentage of moderate to severe depression at 29%. These findings emphasize the socioeconomic dimensions of mental health in hemodialysis patients, highlighting the need for interventions that address not only medical aspects but also the social determinants of well-being.

Finally, the primary caregiver's role was explored, with spouses being the primary caregivers for 60% of the patients. Spousal caregivers exhibited a depression rate of 29% however, it should also be noted that the no of patients who have a spouse as a primary caregiver is also high, while children and other family members, constituting 36% of primary caregivers, reported an 11% depression rate. Patients without a primary caregiver, although a smaller group at 4%, and surprisingly all of them showed depressive symptoms. These findings highlight the impact of familial support on mental well-being, suggesting that the nature of caregiving relationships plays a crucial role in depression outcomes among hemodialysis patients.

The examination of depression severity among hemodialysis patients based on marital status revealed notable disparities. Among the married individuals (56 patients), 24% experienced mild depression, 20% had moderate symptoms, and 36% exhibited severe depression. In contrast, among the unmarried individuals (14 patients), only 3% experienced mild depression, 9% had moderate symptoms, and 9% exhibited severe depression.

Table 4. Association of Socio-Demographic Characteristics with Depression Severity among Hemodialysis Patients.

Characteristics	No. of Patients	Depression severity			Percentage (%)
		Non-depression	Mild	Moderate-Severe	
Weight					
Underweight	15	2(3%)	5(7%)	8(11%)	21%
Normal	42	13(19%)	11(16%)	18(26%)	60%
Overweight	08	3(4%)	3(4%)	2(3%)	11%
Obese	05	1(2%)	0%	4(6%)	8%
Education					
Graduated	18	2(4%)	8(11%)	7(10%)	26%
Ungraduated	52	16(23%)	12(17%)	24(34%)	74%
Economic status					
Lower	40	10(14%)	10(14%)	20(29%)	57%
Middle	30	9(13%)	10(14%)	11(16%)	43%
Upper	0	0	0	0	0
Marital status					
Married	56	17(24%)	14(20%)	25(36%)	80%
Unmarried	14	2(3%)	6(9%)	6(9%)	20%
Divorced	0	0	0	0	0
Monthly Salary in Indian rupees					
<25,000	42	10(14%)	10(14%)	22(31%)	60%
25,000-50,000	28	9(13%)	10(14%)	9(13%)	40%
>50,000	0	0	0	0	0
Primary caregiver					
None	3	0	0	3(4%)	4%
Spouse	42	11(16%)	11(16%)	20(29%)	60%
Children and other family members	25	8(11%)	9(13%)	8(11%)	36%

The results obtained from the Sleep Epworth Scale assessment provide valuable insights into the prevalence and severity of daytime sleepiness among the study participants. These findings suggest a considerable variation in the levels of daytime sleepiness within the study population. The prevalence of heightened daytime sleepiness, especially in the category prompting medical attention, underscores the importance of further investigation into potential sleep disorders or underlying health issues contributing to excessive

sleepiness. The Sleep Epworth Scale proves to be a valuable tool in assessing and categorizing the severity of daytime sleepiness, providing a basis for tailored interventions to address sleep-related concerns among the study participants. Overall, these results contribute to a better understanding of sleep patterns and potential health implications in the context of hemodialysis patients (Table 5).

Table 5. Sleep Severity Assessment by Epworth Scale among Haemodialysis Patients.

Score	Severity	Percentage (%)
0-7	It is unlikely that you are abnormally sleepy.	23(33%)
8-9	Average amount of daytime sleepiness	10(14%)
10-15	Excessively sleepy depending on the situation	34(49%)
16-24	Excessively sleepy and should consider seeking medical attention.	3(4%)
Total		**100%**

The study explored the association between depression and altered laboratory values among hemodialysis patients. Among the participants, 30% had normal albumin levels, while 70% exhibited decreased levels. Similarly, for hemoglobin levels, 41% were within the normal range, while 59% showed decreased levels. These findings suggest a significant proportion of hemodialysis patients experience abnormalities in laboratory values, particularly decreased albumin and hemoglobin levels, which may be associated with the presence of depression. Further investigation into the relationship between these laboratory abnormalities and depression severity is warranted for a more comprehensive understanding of their interplay and implications for patient care (Table 6).

Table 6. Comparison of Laboratory Values in Hemodialysis Patients: Normal V/s. Decreased Levels.

Laboratory test	Normal Laboratory values	Normal value among patients	Decreased value among patients
Albumin	3.4-5.5g/dl	21(30%)	49 (70%)
Hemoglobin	12-15g/dl	29(41%)	41 (59%)

Patients on the morning shift lived farther from the dialysis unit in a rural area. The prevalence of depression was higher among patients in the morning shift (Table 7).

Table 7. Associations between Dialysis Timing and Depression in Hemodialysis

Time of dialysis	Depressed	Non-Depressed	Total
Morning	29(78%)	8(22%)	37(100%)
Afternoon	11(73%)	4(27%)	15(100%)
Evening	11(61%)	7(39%)	18(100%)

The most important difference in depression prevalence was between individuals in the morning and evening dialysis shifts. There was not a big difference between afternoon and evening dialysis shifts (Fig. 2).

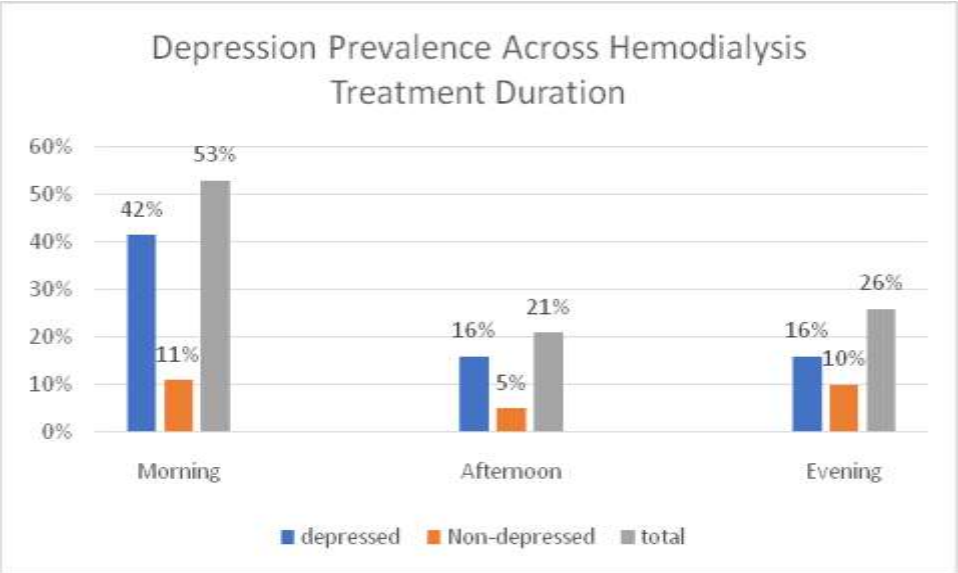

Fig. 2

Discussion

The findings of the study on depression among hemodialysis patients provide a rich ground for discussion, shedding light on intricate relationships between various factors and mental health outcomes in this specific medical context.

Demographic influences are integral to mental health outcomes, and our findings align with existing research. Hedayati et al. (2010) emphasize the impact of marital status on mental health outcomes among hemodialysis patients, revealing higher rates of depression among divorced individuals (9). The present study extends these findings, shedding light on broader psychosocial factors. Economic disparities, another critical socio-demographic aspect, correlate with depression severity, Cukor et al.'s (2006) conclusions regarding the influence of socio-economic factors on depression in chronic kidney disease patients (5). The present finding also aligns with Ahlawat R et al (7). These insights underscore the need for a holistic, patient-centered approach that considers the socio-economic dimensions of mental health in hemodialysis care. In the present study, a significant association was observed between depression and lower educational status. A similar finding was observed in another study done by Vincy Nelson et al (8) (10).

The present study revealed a noteworthy association between depression prevalence and the timing of dialysis sessions, particularly in patients subjected to morning shifts. The need to wake up early and undertake a substantial commute for morning dialysis sessions contributes to increased stress and fatigue, potentially influencing mental health outcomes. This finding aligns with the broader understanding that logistical challenges and treatment-related burdens can significantly impact the

psychological well-being of hemodialysis patients. This interpretation aligns with the works of Weisbord et al. (2005), who emphasized the intricate relationship between dialysis-related burdens and depressive symptoms (11). In their study, logistical challenges, including transportation difficulties and long travel distances, emerged as significant contributors to psychological distress among hemodialysis patients. This interpretation also aligns with Flavio Teles et al (12) additionally, Lin et al. (2015) explored the impact of commuting time on the quality of life in hemodialysis patients, shedding light on the potential stressors associated with lengthy travel for treatment (13). Therefore, our findings resonate with existing literature, emphasizing the importance of considering the practical aspects of the treatment process in understanding the temporal dynamics of depression in hemodialysis patients.

Present findings align with the existing literature (12) (14) Almutary et al. (2018) advocate for integrated care in managing depression in chronic kidney disease patients, emphasizing the interplay between physical health and mental well-being (15). The findings align with this perspective, highlighting the importance of holistic patient care that addresses both the medical and psychological dimensions of the patient's condition. By considering health-related factors within the broader context of mental health, our study contributes to the ongoing discourse on the inter connectedness of physical and mental well-being in hemodialysis care.

The analysis of sleep-related issues, as measured by the Sleep Epworth Scale, resonates with existing literature emphasizing the bidirectional relationship between sleep disturbances and depression. Palmer et al. (2013) conducted a meta-analysis highlighting the prevalence of sleep disorders in hemodialysis patients and their impact on mental health outcomes (16). Our study underscores the need for routine assessments of sleep-related issues, integrating them into comprehensive care strategies to improve overall mental health outcomes in this vulnerable population.

However, the study identified that males showed a greater tendency to get depressed than females. This finding was not identical to other studies where females were found to be almost twice more depressed than males (6). The gender differences may require further data accumulation and analysis to make the conclusion the influence of gender on depression among haemodialysis patients.

The present study contributes valuable insights into the intricate dynamics of depression among hemodialysis patients. The multifaceted nature of the findings, when considered alongside existing literature, paints a comprehensive picture of the factors influencing mental health outcomes in this vulnerable population. The socio-demographic, temporal, and health-related dimensions uncovered underscore the need for a holistic and personalized approach in hemodialysis care, emphasizing the importance of addressing the interconnected aspects of physical and mental well-being.

Conclusion

In summary, the study on depression among hemodialysis patients revealed a significant association between various demographic and mental health outcomes. Education, economic status, and caregiver dynamics emerged as influential factors, underlining the importance of a holistic approach to patient care. The timing of dialysis sessions and specific laboratory values also showed correlations with depression. Moreover, the diverse patterns of daytime sleepiness highlighted the need for comprehensive assessments of sleep-related issues in this population. These findings underscore the complexity of mental health in hemodialysis patients and emphasize the necessity for tailored interventions that consider the multifaceted aspects of their well-being.

Conflict of Interest: There is no conflict of interest among authors.

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