

Original Article**The Prevalence of Depression in Patients undergoing Haemodialysis**Prithi Bahadur Rai^{*1}, Birendra Kumar Chaudhary¹, Sailendra Shrestha²¹ Department of Psychiatry, ² Department of Nephrology, Nobel Medical College Teaching Hospital, Biratnagar, NepalArticle Received: 28th November, 2024; Accepted: 26th December, 2024; Published: 31st December, 2024DOI: <https://doi.org/10.3126/jonmc.v13i2.75244>**Abstract****Background**

End-stage renal disease requires dialysis treatment, with haemodialysis and peritoneal dialysis being the two primary modalities. These treatments often lead to psychological distress, including depression and anxiety, which adversely affect patients' quality of life and treatment adherence. Although both dialysis modalities have been associated with mental health issues, limited research compares the prevalence of depression and anxiety between haemodialysis and peritoneal dialysis patients.

Materials and Methods

This observational cross-sectional study, conducted at Nobel Medical College Teaching Hospital, Biratnagar, enrolled 129 dialysis patients. Ethical approval was obtained, and informed consent was acquired from participants. The Beck Depression Inventory, Beck Anxiety Inventory, and the Hospital Anxiety and Depression Scale were used to assess depression and anxiety levels. Data were analyzed using the Student's t-test and chi-square tests, with a significance level set at $p < 0.05$.


Results

Of the 129 patients, 27.27% of haemodialysis patients and 42.10% of peritoneal dialysis patients exhibited depression on the Beck Depression Inventory. On the Hospital Anxiety and Depression Scale, 10.90% of haemodialysis patients and 21.05% of peritoneal dialysis patients showed depression symptoms. Anxiety was observed in 27.27% of haemodialysis patients and 10.52% of peritoneal dialysis patients according to the Beck Anxiety Inventory. The differences between groups were not statistically significant ($p > 0.05$).

Conclusion

Depression and anxiety are prevalent among dialysis patients, with no significant difference in the prevalence rate between haemodialysis and peritoneal dialysis groups. This highlights the need for routine screening for mental health disorders in dialysis patients to improve their overall well-being. Tailored mental health interventions should be developed to address the psychological needs of dialysis patients.

Keywords: ESRD, Depression, Dialysis

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Introduction

End-stage renal disease (ESRD) is a life-threatening condition that requires dialysis treatment to maintain kidney function. Haemodialysis (HD) and peritoneal dialysis (PD) are two primary treatment modalities for ESRD patients, both of which present unique challenges like physical, emotional, and psychological challenges. Depression and anxiety are common psychiatric conditions among dialysis patients, significantly impacting their quality of life, treatment adherence, and overall health improvement. Although both HD and PD are associated with high rates of mental health problems, research comparing the prevalence of depression and anxiety between these two groups remains limited.

Hemodialysis requires patients to visit a dialysis centre multiple times a week for extended periods, which can disrupt daily routines and lead to feelings of dependence, social isolation, and emotional distress. Studies have found that these factors may contribute to a higher prevalence of depression and anxiety in hemodialysis patients [1]. In contrast, peritoneal dialysis offers patients more flexibility, as it can be performed at home, potentially allowing for greater autonomy and less disruption to daily life. However, PD patients are still at risk of psychological distress, often related to concerns about self-management, infection risks, and the technical demands of the procedure [2].

While both treatment modalities have been associated with increased rates of depression and anxiety, the specific impact of dialysis modality on the mental health of patients remains under-explored. This study aims to investigate and compare the prevalence of depression and anxiety among patients undergoing HD and PD, examining potential factors that may contribute to the psychological burden in these two groups. Understanding these differences is essential for developing tailored mental health interventions that address the unique needs of dialysis patients.

Materials and Methods

This study was observational cross-sectional, held at the Nobel Medical College Teaching Hospital at Biratnagar in the dialysis unit of the department of nephrology, with all patients undergoing dialysis from 5th April 2023 to 4th April 2024. Ethical approval was obtained from the IRC of Nobel Medical College Teaching Hospital. The sample size was calculated by using the formula,

$n = Z^2 pq/d^2$ (where n is the minimum required sample size, Z is 1.96 at 95% Confidence Interval (CI), p is the prevalence, which was taken to be 25% [3] of the population, q is 1-p, and d is the 8% margin of error, $1.96 \times 1.96 \times 0.25 \times 0.75 / 0.08 \times 0.08 = 113$). Hence, the calculated sample size was 113. However, all the 129 samples during the research period were taken into consideration. Convenience sampling method was used. The patients were interviewed after agreeing to participate in this study and consent form was signed. Inclusion criteria included a known case of end stage renal disease on dialysis who agreed to participate in the study and exclusion criteria was a known psychiatric comorbidity except depression and anxiety and refusal to participate in the study.

The patients so enrolled were subjected to a socio demographic questionnaire, beck depression and anxiety inventory, hospital scale for anxiety and depression. The Beck Anxiety Inventory (BAI) was developed to measure anxiety in adult patients. It can be used in different populations and is easy to deploy and interpret. Some limitations to its use are the lack of studies on the influence of other comorbidities, and patients with panic disorder also score high on the BAI. Thus, with the BDI, BAI has 21 items that assess symptom intensity from 0 (absent) to 3 (severe symptoms; almost unbearable). A score of 0-7 indicates minimum level of anxiety; 8-15 mild anxiety, 16-25 moderate and 26-63 severe anxiety.

The Hospital Anxiety and Depression Scale (HADS) was developed to identify potential new cases of anxiety and depression in adults. HADS differs from other scales because it contains items that address symptoms of anxiety and depression associated with physical illness (such as weight loss, insomnia, fatigue, headache and dizziness) to prevent interference from somatic disorders in scale scoring. It contains 14 items related to emotional and cognitive aspects of depression and anxiety, with seven items for each subscale. Each item is graded 0 to 3, indicating symptom intensity or frequency. The total score ranges from 0-42, and 0-21 for each subscale. The higher the score, the more severe the symptoms; 0-7 indicates the absence of significant symptoms; mild symptoms between 8-10; 11-15 and 16-21 for moderate and severe symptoms, respectively. The questionnaires were administered orally. 129 patients participated in the study, 110 in the group of patients on haemodialysis and 19 in the peritoneal dialysis



group. The researchers interviewed patients after signing the consent form, using the Beck depression and anxiety inventory and the hospital scale of anxiety and depression.

Statistical analysis was carried out by comparing the mean scores between patients on haemodialysis and peritoneal dialysis using the Student's *t*-test, because all distributions were normal, and the chi-square test. *p*-value less than 0.05 were considered significant.

Results

The study sample comprised 129 patients, who were divided into two groups. Group 1 included 110 patients undergoing Haemodialysis (HD), while Group 2 consisted of 19 patients undergoing Peritoneal Dialysis (PD). In Group 1, the mean age was 50.16 ± 11.36 years. This group had 69(62.72%) males and 41 (37.27%) females. Regarding socioeconomic status, 82(37.27%) families had an income of less than 20,000 NPR, whereas 28 (25.45%) families earned more than 20,000 NPR. In terms of marital status, there were 81 (73.63%) married and 29 (26.36%) single patients. A total of 62 (56.36%) patients were from urban areas, while the remaining 48 were from rural areas. The average duration of dialysis for this group was 3.12 years.

Table 1 : Table showing sociodemographic profile of the patients

	Group 1 n=110	Group 2 n=19
Age	56.21 \pm 11.19	52 \pm 11.31
Sex		
Male	69(62.72%)	11(57.89%)
Female	41 9 (37.27%)	8(42.10%)
Socio economic status		
Npr5 0000	82 (74.27%)	13 (68.42%)
Above Npr50000	28(25.45%)	6 (31.57%)
single	29 (26.36%)	4 (21.05%)
Marital Status		
Married	81 (73.63%)	15 (78.94%)
Residence		
Urban	62 (56.36%)	11 (57.89%)
Rural	48 (43.63%)	9 (47.36%)
Dialysis (Yrs)	3.12	1.6

In Group 2, the mean age was 52 ± 11.31 years. This group had 11(57.89%) males and 8 (42.10%) females. Socioeconomic status showed that 13 families earned less than 20,000 NPR, while 6 families earned more than 20,000 NPR. Marital status revealed 14 married and 5 single patients. There were 11 urban residents, while the remaining 8 were from rural areas. The average duration of dialysis for this group was 1.6 years.

Table 2 : Table showing the comorbidities in group 1 and 2.

	Group 1 (n=110)	Group 2 (n=19)	<i>p</i> value
High blood pressure	48 (43%)	7(36.84%)	0.25
Diabetes mellitus	29 (26.33%)	9(47.36%)	
Glomerulonephritis	17(15.45%)	2(10.52%)	
others	16(14.54%)	1(5.26%)	

The results indicated that 48 patients in Group 1 and 7 patients in Group 2 were affected by hypertension. Diabetes was observed in 29 patients in Group 1 and 9 patients in Group 2. Additionally, glomerulonephritis was present in 17 patients in Group 1 and 2 patients in Group2. The *p* value was 0.25 which was not significant.

Table 3: table showing the scores of patients suffering from depression and anxiety on Beck depression and anxiety inventory and hospital anxiety and depression scale.

	Group 1 (n=110)	Group 2 (n=19)	<i>p</i> value
Beck Anxiety inventory	30 (27.27%)	2(10.52%)	0.17
Beck depression inventory	27(24.54%)	8(42.10%)	0.12
Hospital Scale of Anxiety	10(9.09%)	0(0%)	0.60
Hospital Scale of Depression	12(10.90%)	4(21.05%)	0.61

The results of the group 1 showed that out of total of 110 patients 27 (24.54%) showed depression in BDI and 8 (42.10%) in group 2 and a *p* value of 0.12, whereason HDS it was 12 (10.90%) and 4 (21.05%) and *p* value of 0.61 respectively. On the anxiety scales the group 1 showed 30 (27.27%) patients suffering from anxiety on BAD and 10(9.09%) on HAS, in group 2, it was 2 (10.52%) and 0 respectively. The *p* value was not significant.

Discussion

Many studies have investigated the psychological impact of dialysis on patients, focusing on the presence of depression and anxiety. According to Kimmel et al., patients with ESRD are at higher risk for depression and anxiety compared to the general population, with the prevalence of depression ranging from 20% to 60%. This variation is influenced by many factors, including age, gender, the person's health status, and underlying kidney diseases and comorbidities like diabetes and hypertension [4-6]. In our study we found that 27.27 persons in the studies also show that haemodialysis patients are more likely to develop mental health problems due to frequent and prolonged haemodialysis treatment. These patients often experience greater fatigue, isolation, and lack of independence, which can lead to greater



depression and anxiety. In contrast, because of the benefits of family therapy, Peritoneal dialysis patients may experience less anxiety due to their independence and flexibility [5, 7, 9]. In our study also, we found that patients in Beck anxiety inventory had 10.52% persons suffering from the anxiety in the PD and 27.27 in the HD.

Younger patients may have longer life expectancies and fewer complications, but they may sometimes experience anxiety due to uncertainty about their health and quality of life. Studies have shown that female dialysis patients are at higher risk for depression and anxiety compared to male dialysis patients. Female patients may face additional challenges such as greater isolation, financial hardship, and increased caregiving responsibilities, all of which may contribute to mental health problems [6, 10, 12]. Additionally, women with ESRD may have negative thoughts about their bodies and physical limitations, which can lead to depression and anxiety. The mean age in our study was nearly similar in HD group it was 56.21 ± 11.19 years and it was 52 ± 11.31 years in the PD group. Low Socioeconomic status is associated with higher levels of depression and anxiety. Patients from low socioeconomic backgrounds may face financial hardship, limited access to healthcare, and inadequate support, all of which increase the risk of mental illness. [7, 11, 14] Low-income patients are more likely to experience stress, which may negatively impact their ability to cope with the challenges of dialysis and chronic illness. Nearly 74 % were from the low socioeconomic groups in HD and 69% in PD.

Diabetes, hypertension, glomerulonephritis are common causes of end-stage renal disease, and these conditions are associated with an increased risk of depression and anxiety [8, 13, 14]. Diabetics often experience anxiety about managing their disease long term, including fears of complications such as neuropathy, retinopathy, and heart disease. Another cause of kidney disease, high blood pressure, can increase psychological distress as patients face the treatments and physical restrictions required to control blood pressure and prevent further damage to the body. Additionally, glomerulonephritis often results from undiagnosed infections and can lead to increased anxiety and depressive symptoms due to the chronicity and uncertainty of the disease [3, 9, 11]. In our study 43% in HD group, 36% in the PD group had hypertension, 26 and 47% had diabetes mellitus.

One study found that haemodialysis patients were more likely to experience depression and anxiety than PD patients. This may be because

haemodialysis treatment is more demanding and physical, requiring patients to visit dialysis centre several times a week, leading to dependency and isolation. In contrast, people with Parkinson's disease generally report lower levels of anxiety, making them more independent of home care, but they still experience fear of infection and psychological distress related to home dialysis arrangements [8, 14].

Conclusion

It was concluded in our study that anxiety and depressive disorders are common amongst the patients undergoing dialysis in our study sample. The patients undergoing dialysis should be screened for such mental illnesses, to improve their quality of life. No statistically significant difference was noted between the dialysis types performed.

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Conflict of interest: None

References

- [1] Polikandrioti M, Kalafatakis F, Tsoulou V, Gerogianni G, Anxiety and Depression in Hemodialysis: Sex Differences, *Adv Exp Med Biol.* 1337 (2021) 245-258. DOI: 10.1007/978-3-030-78771-4_28. PMID: 34972912.
- [2] Nadort E, Schouten RW, Luijckx X, Shaw PKC, van Ittersum FJ, Smets YF et al., Symptom dimensions of anxiety and depression in patients receiving peritoneal dialysis compared to haemodialysis, *Perit Dial Int.* 42:3 (2022) 259-269. DOI: 10.1177/08968608221086734. PMID: 35383509.
- [3] Nagy E, Tharwat S, Elsayed AM, Shabaka SA, Nassar MK. Anxiety and depression in maintenance hemodialysis patients: prevalence and their effects on health-related quality of life. *International Urology and Nephrology.* 2023 Nov;55(11):2905-14. DOI: <https://doi.org/10.1007/s11255-023-03556-7>.
- [4] Kimmel PL, Cukor D, Cohen SD, Peterson RA, Depression in end-stage renal disease patients: a critical review, *Adv Chronic Kidney Dis.* 14:4 (2007) 328-34. DOI: 10.1053/j.ackd.2007.07.007. PMID: 17904499.
- [5] Griva K, Kang AW, Yu ZL, Mooppil NK, Foo M, Chan CM et al., Quality of life and emotional distress between patients on peritoneal dialysis versus community-based hemodialysis, *Qual Life Res.* 23:1 (2014) 57-66. DOI: 10.1007/s11136-013-0431-8. PMID: 23689932.
- [6] Cobo G, Hecking M, Port FK, Exner I, Lindholm B, Stenvinkel P, Carrero JJ, Sex and gender differences in chronic kidney disease: progression to end-stage renal disease and haemodialysis, *Clinical science.* 130:14 (2016) 1147-63. DOI: <https://doi.org/10.1042/CS20160047>.
- [7] Patel SS, Peterson RA, Kimmel PL, Psychosocial factors in patients with chronic kidney disease: The impact of social support on end-stage renal disease,



- In Seminars in dialysis. 18:2 (2005) 98-102. DOI: <https://doi.org/10.1111/j.1525-139X.2005.18203.x>.
- [8] Stasiak CE, Bazan KS, Kuss RS, Schuinski AF, Baroni G, Prevalence of anxiety and depression and its comorbidities in patients with chronic kidney disease on hemodialysis and peritoneal dialysis, *Brazilian Journal of Nephrology*. 36 (2014) 325-331. DOI: <https://doi.org/10.5935/0101-2800.20140047>.
- [9] Yucedal C, Olmez N, Gezen G, Celik F, Altindag A, Yilmaz ME et al., Depression in dialysis patients, *EDTNA-ERCA Journal*. 29:3 (2003)151-5. DOI: <https://doi.org/10.1111/j.1755-6686.2003.tb00298.x>
- [10] Semaan V, Noureddine S, Farhood L, Prevalence of depression and anxiety in end-stage renal disease: A survey of patients undergoing hemodialysis, *Applied Nursing Research*. 43 (2018) 80-5. DOI: <https://doi.org/10.1016/j.apnr.2018.07.009>.
- [11] Lopes AA, Albert JM, Young EW, Satayatham S, Pisoni RL, Andreucci VE et al., Screening for depression in hemodialysis patients: associations with diagnosis, treatment, and outcomes in the DOPPS, *Kidney international*. 66:5 (2004) 2047-53. DOI: <https://doi.org/10.1111/j.1523-1755.2004.00977.x>
- [12] Loosman WL, Siegert CE, Korzec A, Honig A, Validity of the Hospital Anxiety and Depression Scale and the Beck Depression Inventory for use in end-stage renal disease patients, *Br J Clin Psychol*. 49 (2010) 507-16. DOI: <http://dx.doi.org/10.1348/014466509X477827>
- [13] Wu AW, Fink NE, Marsh-Manzi JV, Meyer KB, Finkelstein FO, Chapman MM et al., Changes in quality of life during hemodialysis and peritoneal dialysis treatment: generic and disease specific measures, *J Am Soc Nephrol*. 15 (2004) 743-53. DOI: <http://dx.doi.org/10.1097/01.ASN.0000113315.81448.CA>.
- [14] Smarr KL, Keefer AL, Measures of depression and depressive symptoms: Beck Depression Inventory-II (BDI-II), Center for Epidemiologic Studies Depression Scale (CES-D), Geriatric Depression Scale (GDS), Hospital Anxiety and Depression Scale (HADS), and Patient Health Questionnaire-9 (PHQ-9), *Arthritis Care Res (Hoboken)*. 63 (2011) S454-66. DOI: <http://dx.doi.org/10.1002/acr.20556>.

