

Why Hemodialysis Patients Struggle: Exploring the Causes and Life Impact of Anxiety and Depression

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Abstract

End-stage renal disease requires lifelong dialysis or transplantation, imposing substantial physical, emotional, and social limitations. Frequent hemodialysis (HD) disrupts daily functioning and is associated with anxiety, depression, poor quality of life (QoL), nonadherence, and adverse clinical outcomes. Given the global variation in chronic kidney disease epidemiology and anxiety prevalence in HD (12%–52%), this systematic review synthesizes recent evidence on the psychological effects of HD specifically anxiety and depression to identify influencing factors and interventions. Following the Preferred Reporting Items for Systematic reviews and Meta-Analyses guidelines and Cochrane Handbook for Systematic Reviews of Interventions, a January 2022 search across six databases (PubMed, Scopus, and Web of Science) and additional sources used terms for hemodialysis, anxiety, depression, psychological problems, and QoL. Peer-reviewed English studies were screened (2018–2023), excluding non-empirical work and studies with substantial heterogeneity. From 693 records and 250 additional sources, 105 full texts were screened and 20 were included. Depression and anxiety were consistently prevalent. In Northern China, 55.1% of 305 HD patients had depression and 25.9% anxiety; low income and comorbidities increased depression risk. Dialysis patients showed a greater psychological burden than transplant recipients, with depression threefold and anxiety 1.5-fold higher. Socioeconomic disadvantage, limited social support, education and income gradients, stress, coping style (emotion-focused coping predicting better QoL), and physical health indicators were identified as correlates. Anxiety symptoms predicted higher mortality and hospitalization rates in the maintenance cohorts. Non-pharmacological interventions, including mindfulness and music therapy, reduced symptoms, with mindfulness benefits persisting for six months. Overall, routine psychological screening integrated into multidisciplinary nephrology care, alongside psychosocial and non-pharmacological interventions, is implicated in improving well-being and outcomes. Future longitudinal and interventional studies should standardize screening and evaluate its long-term effectiveness.

Key words: Anxiety, depression, end-stage renal disease, hemodialysis, psychological problems, quality of life

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INTRODUCTION

End-stage renal disease (ESRD) is life-threatening without dialysis or transplantation. A meta-analysis indicated a 0.1% prevalence of Stage 5 chronic kidney disease (CKD).^[1] Incidence rates differ globally, highlighting the need for data from Indonesia. Hemodialysis (HD) requires three to five sessions weekly, often disrupting work and mental health and increasing depression and anxiety.^[2] These treatments adversely affect the quality of life (QoL).^[3] ESRD presents both physiological and psychological challenges.^[4] Anxiety among HD patients ranges from 12% to 52%,^[5] likely due to demographic and assessment variations.^[6] Associated factors include gender, age, self-efficacy, itchiness, alcohol use, body mass index, and QoL.^[7-9] This review examines HD and its psychological effects and asks what factors influence the mental health of patients.

HD is essential for ESRD but causes physical, emotional, and social challenges. This process occurs frequently and restricts daily activities, leading to fatigue, anxiety, and depression, which are linked to negative health outcomes and treatment non-adherence.^[10]

Patients face costly healthcare, frequent hospitalizations, and uncertain life expectancy, which heightens their stress. Patients with ESRD experience social isolation and fear of death, which reduces their activity and mental health.^[6] Although psychological issues are identifiable, a gap remains in understanding the epidemiological factors of anxiety and depression in HD. Previous studies have emphasized the importance of age, sex, comorbidities, and social support; however, the findings have varied, necessitating further research.

This systematic review evaluated research on the psychological effects of HD, focusing on anxiety and depression. It identifies research gaps to propose interventions that enhance the mental health and QoL of patients with HD.

METHODS

This systematic review adhered to the Preferred Reporting Items for Systematic reviews and Meta-Analyses guidelines.^[11,12] In January 2022, six databases, including PubMed, Scopus, and Web of Science, were identified from the searched materials. Searches utilized combinations of terms “hemodialysis,” “anxiety,” and “and.” Keywords for “depression” and “patients” were derived from relevant systematic review terms and database-recommended alternatives.

Search terms included (HD or “kidney” or “depression” or “depressive” or “anxiety” or “patients” or “psychological problems” or “Quality of life” or “Illness” or “Health” or “Treatment” or “correlation”). The search criteria included only peer-reviewed articles published between 2018

and 2022. Feasibility research indicated that the study was unviable despite progress in understanding the causes of anxiety and depression among patients undergoing HD. The search was restricted to English-language literature, and non-empirical studies were excluded from the screening.

Titles and abstracts were evaluated, followed by a full review based on the inclusion/exclusion criteria. Research on anxiety and depression in patients undergoing HD has yielded varied results. The team excluded research that could introduce unpredictability, as elaborated below. Many studies have relied on qualitative data from participants’ friends and colleagues.

The inclusion criteria encompassed peer-reviewed articles, full-text English papers, qualitative studies, or systematic reviews, published between 2019 and 2023, focusing on dialysis patients. The exclusion criteria were articles published before 2015, studies with significant heterogeneity, non-peer-reviewed or preprinted articles, and non-English papers.

A data sheet was created to analyze anxiety and depression among patients undergoing HD. An iterative approach was used to read the data to inductively identify themes, and the findings guided the article construction. Extensive coding preceded the data categorization. To determine topic prominence, frequency, and study weight were considered. The primary investigator provided the initial topic classification. Through discussion, some items were removed as they were related to other psychological issues. This introspection facilitated the development of themes that were aligned with the data. Data were analyzed to ensure that the final articles corresponded with the research outcomes.

According to the Cochrane Handbook for Systematic Reviews of Interventions, systematic reviews gather evidence that meets predetermined eligibility criteria to address specific research questions. These reviews strive to reduce bias by employing the systematic methods outlined in a protocol.^[13]

RESULTS

The contingency search collected 693 papers from various databases, plus 250 articles from organizational websites, citations, and other sources. After reviewing the titles and abstracts, 125 papers were excluded for failing to meet the inclusion criteria. Studies were selected based on the predefined themes. Full-text articles were sought; if unavailable, they were excluded if the abstract and title lacked sufficient information. Ultimately, some documents were omitted due to inaccessibility or failure to meet the criteria. After screening 105 papers, 20 studies were included in this systematic review, as illustrated in the Preferred Reporting Items for Systematic reviews and Meta-Analyses flow diagram in Figure 1.

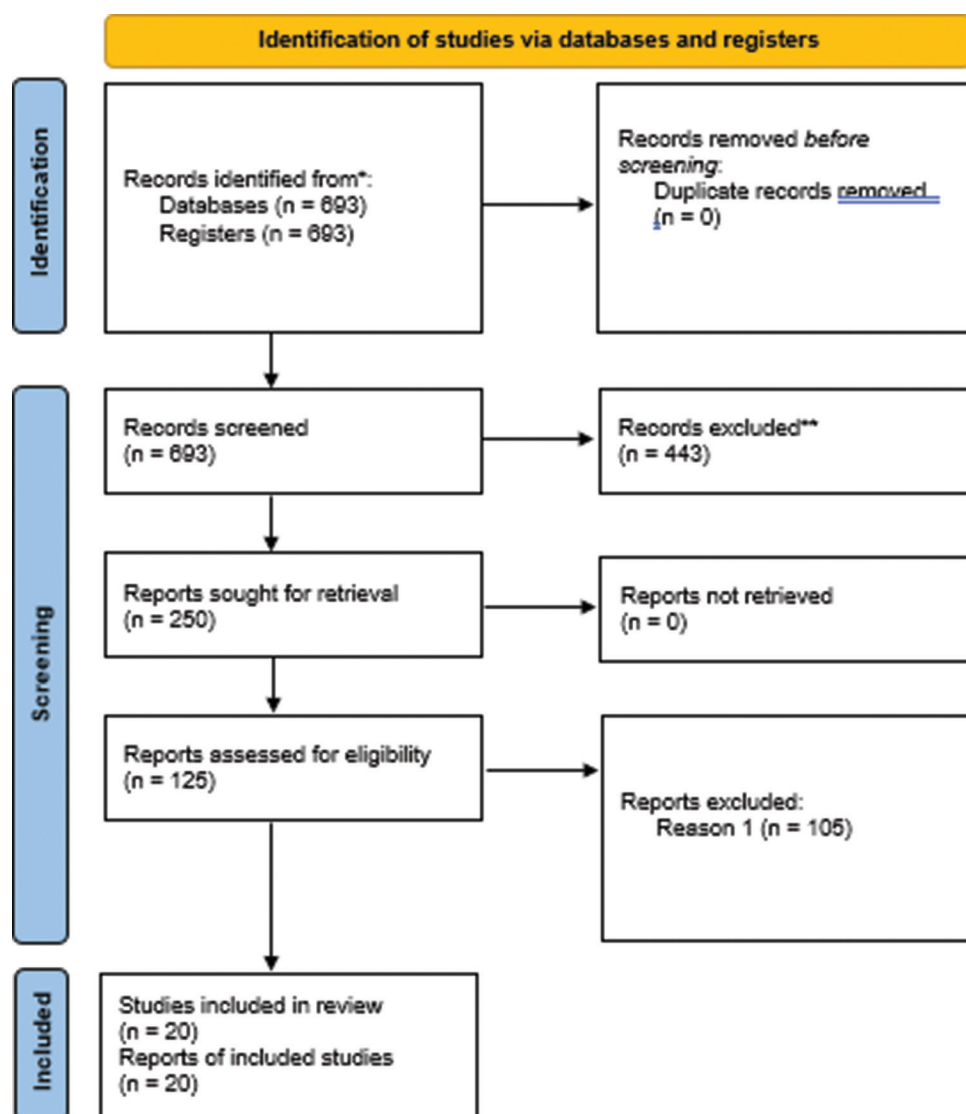


Figure 1: Preferred Reporting Items for Systematic reviews and Meta-Analyses flowchart of study selection

Selected articles from various countries employed diverse methods to examine the incidence, risk factors, and treatments for anxiety and depression in patients undergoing HD. Several studies have highlighted the high prevalence of these conditions. Summary characteristics of included patients were presented in Table 1. Meng *et al.* conducted a qualitative study on 305 HD patients in Northern China.^[14] Using the Zung Self-Rated Depression and Anxiety Scale, they found that 55.1% of patients experienced depression and 25.9% had anxiety. The risk factors for depression included low family income and comorbidities. Similarly, Brito *et al.* examined mood disorders in 205 patients undergoing dialysis and kidney transplantation and found a high likelihood of depression and anxiety among patients undergoing dialysis.^[15] In India, Kumar *et al.* studied 150 HD patients and identified high levels of anxiety and depression linked to factors such as education, income, and family support.^[16]

Studies have also explored the social determinants impacting the mental health of patients undergoing HD. Meng *et al.* identified

low family income as a significant determinant of depression.^[14] In addition, a survey by Gerogianni *et al.* of 414 Greek patients undergoing HD observed a bidirectional relationship between anxiety and depression; patients with high stress levels were more likely to be depressed.^[17] Furthermore, controlling for gender, age, and employment, perceived socioeconomic status influenced mental health, suggesting that SES correlates with negative psychological status in this population.

Studies have also examined interventions to improve the mental well-being of patients undergoing HD. Rigas *et al.* conducted a Canadian randomized controlled trial assessing mindfulness and health enhancement programs on depression.^[18] Both methods proved beneficial, with mindfulness showing prolonged effects 6 months later. Furthermore, Imani *et al.* evaluated the effects of instrumental music therapy on anxiety and depression in 50 Iranian patients undergoing HD.^[19] Their trial demonstrated that music therapy reduced both endorsing non-pharmacological interventions for the mental health of this group.

Table 1: Summary characteristics of included patients

Author	Title	Country	Sample size	Aims	Methods	Findings
Meng <i>et al.</i> ^[14]	Prevalence of depression and anxiety in patients undergoing maintenance HD	Northern China	305	To explore the rates of depression and anxiety in patients undergoing HD and identify risk factors.	Zung Self-Rated Depression and Anxiety Scales	High prevalence observed: depression at 55.1% and anxiety at 25.9%. Identified predictors include low family income and comorbidities for depression.
Rigas <i>et al.</i> ^[18]	Long-term effects of mindfulness intervention versus health enhancement for treating depression	Canada	-	To evaluate the sustainability of mindfulness intervention in reducing mood disorder symptoms after 6 months.	RCT	Both interventions improved mood disorder symptoms; mindfulness may offer more significant benefits.
Imani <i>et al.</i> ^[19]	Impact of instrumental music on anxiety and depression among patients undergoing HD	Iran	50	To assess the efficacy of music therapy on anxiety and depression in patients undergoing HD.	RCT	Instrumental music therapy significantly reduced anxiety and depression levels in patients.
Dziubek <i>et al.</i> ^[21]	Depression and anxiety in CKD and post-transplant patients	Poland	283	To compare depression, anxiety, and life satisfaction across CKD patient groups.	Various Psychometric Scales	Stage V CKD patients exhibited the highest depression levels; a link between mood and handgrip strength was observed.
Yaseen <i>et al.</i> ^[23]	Quality of life, anxiety, and depression in patients with RLS undergoing HD	Pakistan	-	To investigate the effects of RLS on quality of life, anxiety, and depression in hemodialysis patients.	Observational Cross-Sectional Study	There is no significant correlation between RLS and quality of life; early examination and treatment of RLS is advised.
Brito <i>et al.</i> ^[15]	Prevalence of depression and anxiety among dialysis and kidney transplant patients	Brazil	205	To evaluate the prevalence of mood disorders among renal replacement therapy patients.	Cross-Sectional Study	Higher prevalence of depression and anxiety in dialysis patients is influenced by comorbidities and quality of life issues.
Işık Ulusoy and Kal. ^[20]	Coping strategies, quality of life, and anxiety in patients undergoing HD	Turkey	117	To analyze the relationship between coping strategies, quality of life, and mental health in patients undergoing HD.	Beck Depression and Anxiety Scales	Emotion-focused coping methods were linked to improved quality of life and reduced depression risk.
Kumar <i>et al.</i> ^[16]	Depression and anxiety in CKD patients undergoing HD	India	150	To assess the prevalence of depression and anxiety in patients with CKD on HD.	Prospective Observational Cross-Sectional Study	In-depth analysis of depression and anxiety prevalence linked to sociodemographic factors in patients undergoing HD.
Gerogianni <i>et al.</i> ^[17]	Anxiety and depression in dialysis patients and caregivers	Greece	414	To examine anxiety and depression levels in dialysis patients and their caregivers.	Cross-Sectional Study	Found a connection between patient anxiety and caregiver depression, underscoring the need for tailored interventions.
Schouten <i>et al.</i> ^[22]	Anxiety symptoms, mortality, and hospitalization in maintenance dialysis patients	Netherlands	687	To evaluate the relationship between anxiety symptoms and health outcomes in dialysis patients.	Prospective Cohort Study	Anxiety symptoms were identified as significant risk factors for increased mortality and hospitalization in dialysis patients.
Mok <i>et al.</i> ^[24]	Longitudinal study on depression and anxiety in incident peritoneal dialysis patients	Hong Kong	-	To investigate the prevalence of mood disorders and quality of life among new peritoneal dialysis patients.	Survey	High levels of anxiety and depression correlate with poor quality of life; further studies on targeted interventions are recommended.

HD: Hemodialysis, RCT: Randomized controlled trial, CKD: Chronic kidney disease, RLS: Restless legs syndrome

Another focus was the link between coping and mental health issues. İşik Ulusoy and Kal conducted cross-sectional research in Turkey on 117 patients undergoing HD, revealing that emotion-focused coping improved QoL and predicted lower depression.^[20] This underscores the importance of educating patients about effective crisis interventions in treatment plans.

Some studies have focused on comorbidities. Dziubek *et al.* compared 283 CKD patients and 283 post-transplant patients, assessing depression and anxiety.^[21] Depressive disorder was most prevalent in Stage V patients with CKD, with a moderating relationship between mood disorders and physical health, particularly in terms of handgrip strength. In a study involving 687 patients undergoing maintenance dialysis, Schouten *et al.* discovered that anxiety symptoms predicted higher mortality and hospitalization, highlighting the importance of biopsychosocial care.^[22]

Mental health, QoL, and sleep were also assessed. Yaseen *et al.* conducted an observational study on patients with restless leg syndrome (RLS) undergoing HD.^[23] The study found no direct link between RLS and QoL, suggesting that early RLS assessment is crucial to prevent mental health deterioration. Mok *et al.* surveyed patients undergoing peritoneal dialysis and found that anxiety and depression negatively impacted QoL, advocating for early intervention to improve long-term outcomes.^[24]

DISCUSSION

This study found that the group exhibited high rates of depression and anxiety. Notably, depression was 3 times more prevalent in patients undergoing dialysis than in transplant recipients, whereas anxiety was 1.5 times more common in patients undergoing dialysis. Depression and anxiety are common challenges faced by individuals with CKD. This study provides insights into how mental health issues influence CKD outcomes. If unaddressed, psychiatric comorbidities may affect treatment success and increase mortality.^[25-27] The incidence of psychological problems among patients with CKD is increasing.

The elevated rates of depression and anxiety in patients with CKD compared to those with other chronic conditions are concerning. Mental health issues in CKD are less studied than those in heart disease and cancer. Epidemiological studies indicate that patients with CKD are prone to depression and anxiety, particularly those with specific social, psychological, and clinical characteristics. These associations help practitioners to efficiently identify and diagnose mental health issues.^[28-30]

Offering suitable therapies is essential to integrate systematic distress screening into clinical care. Promising treatment options are emerging for patients with CKD and

depression, although they remain in the early stages. Limited interventions, such as pharmacotherapy and psychotherapy, alleviate symptoms.^[31-33] Patients with CKD receiving pharmacological treatment for depression must consider potential renal drug interactions. These individuals require support to adhere to treatment and alter their negative perceptions of their illness.

Consideration should also be given to anxiety, disease progression, future worries, demoralization, death, hopelessness, meaning of life, and recurring psychological and physical trauma.^[25,34]

This systematic review underscores the mental health impact of CKD treatment, particularly among patients undergoing HD, who exhibit high levels of depression and anxiety. This burden extends beyond physical symptoms and intertwines with the social and psychological pressures of the HD process. The frustration of painful dialysis and uncertainty about disease progression contribute to helplessness and anxiety. Furthermore, social and economic challenges, such as reduced income, lack of support, and unemployment, exacerbate these problems. These factors affect the health-related QoL, adherence to HD regimens, and clinical outcomes.^[35-38]

This review highlights two key areas for action: Early detection and timely intervention. Early identification of psychiatric disorders through psychological assessments can prevent or mitigate worsening mental health conditions, thereby improving patient care. In addition, most reviewed studies, including those utilizing psychotherapeutic methods such as mindfulness and music therapy, suggest the need for future research on non-pharmacological treatments. In addition to reducing anxiety and depression symptoms, these therapies enhance coping mechanisms and psychological resilience in individuals with CKD.^[21,32,39]

These insights emphasize the need to integrate comprehensive psychiatric care into the standard treatment for individuals with HD. Therefore, incorporating psychological interventions alongside educational initiatives and social support services in nephrology care could lead to more holistic outcomes. Ultimately, this review's findings underscore the importance of acknowledging psychological needs in managing patients undergoing HD to enhance prognosis and QoL.^[28,31,32]

CONCLUSION

Depression and anxiety are common in patients undergoing HD, adding to the burden of CKD, yet are often overlooked. This review shows that psychological distress is associated with a lower QoL, reduced adherence, hospitalization risk, and poor clinical outcomes. Compared with transplant recipients, patients undergoing HD have a higher burden of symptoms, reflecting the social and emotional challenges of dialysis.

Socioeconomic disadvantage, limited support, comorbidities, coping difficulties, and uncertainty about disease progression contribute to psychological disorders. Recent findings suggest that non-pharmacological interventions, including mindfulness, music therapy, exercise, and psychosocial support, can reduce depression and anxiety while improving resilience and well-being.

Therefore, regular psychological screening should be integrated into nephrology care to address these issues. A multidisciplinary approach combining psychiatric evaluation, interventions, patient education, and social support may improve mental health and treatment outcomes. Future longitudinal and interventional studies should establish screening protocols and assess the long-term effectiveness of pharmacological and non-pharmacological interventions.

INSTITUTIONAL REVIEW BOARD STATEMENT

Not applicable.

INFORMED CONSENT STATEMENT

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DATA AVAILABILITY STATEMENT

Not applicable.

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