RJCCN REVIEW
KIDNEY DISEASE

Psychological Interventions in Chronic Kidney Disease: A Comprehensive A Comprehensive Review of Evidence-based Approaches in Clinical Practice

Simin Adlkhah

Islamic Azad University, Tabriz Branch, Faculty of Medical Sciences, Tabriz, Iran

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Chronic Kidney Disease (CKD) is a progressive condition associated with a high burden of psychological distress, including anxiety, depression, and diminished quality of life. These psychological comorbidities significantly impact clinical outcomes, treatment adherence, and overall survival. This integrative review synthesizes the current evidence regarding effective, evidence-based psychological interventions applicable in the clinical management of CKD patients across various stages of kidney replacement therapy (KRT). We examined the efficacy of cognitive behavioral therapy (CBT), mindfulness-based interventions (MBIs), problem-solving therapy (PST), and technologically delivered interventions (e.g., telehealth, mobile apps) in reducing psychological symptoms and improving self-management behaviors. The literature suggests that structured psychological interventions are effective adjuncts to standard medical care for managing distress in CKD populations. CBT and tailored behavioral therapies show robust evidence for reducing depressive symptoms.

Emerging technologies offer promising avenues for improving accessibility, particularly for patients receiving hemodialysis. Future research should focus on standardizing intervention protocols, exploring cost-effectiveness, and implementing stepped-care models within nephrology units. Integrating mental health screening and timely referral pathways is crucial for optimizing patient outcomes in CKD care.

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INTRODUCTION

Chronic Kidney Disease (CKD) affects millions globally and represents a major public health challenge, characterized by progressive decline in renal function that often necessitates complex medical management, including dialysis or kidney transplantation.[1] Beyond the profound physiological complications such as anemia, malnutrition, and cardiovascular disease, CKD imposes a significant psychological burden. The relentless nature of the disease, frequent medical appointments, invasive treatments, lifestyle restrictions, and the specter of end-stage renal disease (ESRD) contribute to high prevalence rates of psychological morbidity.[1]

Depression and anxiety are among the most frequently reported psychiatric comorbidities in

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CKD, with prevalence estimates often exceeding those found in the general population and other chronic illnesses.[2]

Untreated or undertreated mental health issues are associated with poorer adherence to complex medical regimens (e.g., fluid restriction, medication schedules), increased hospitalization rates, reduced quality of life (QoL), and higher mortality risk in both pre-dialysis and KRT populations.[3] Furthermore, psychological distress can exacerbate physical symptoms, creating a negative feedback loop that impairs patient functioning.

Given the demonstrated impact of mental health on clinical trajectories in nephrology, effective psychological interventions are imperative. Standard nephrology care often focuses predominantly on biomedical markers, frequently overlooking the psychological dimensions of chronic illness management. While pharmacotherapy may play a role, psychosocial interventions, which address coping mechanisms, illness perceptions, and behavioral strategies, are crucial components of holistic, patient-centered care.[4]

This integrative review aims to systematically survey the existing evidence base concerning psychological interventions implemented in CKD patients.

Specifically, we seek to synthesize findings on the efficacy, applicability, and practical implementation of evidence-based psychotherapeutic modalities (such as CBT, MBI, and PST) across the CKD continuum, including patients undergoing maintenance dialysis and those post-transplantation. The ultimate goal is to provide a concise summary to guide clinicians in integrating optimal psychological support into routine nephrology practice.

MATERIALS AND METHODS

Study Design and Search Strategy

This manuscript employs an integrative review methodology, as recommended for synthesizing evidence from varied study designs to establish a comprehensive understanding of clinical topics lacking consistent meta-analytic data.[4] The primary objective was to identify, appraise, and synthesize evidence regarding the efficacy of structured psychological interventions in CKD patients.

A systematic literature search was conducted across major electronic databases, including PubMed/MEDLINE, PsycINFO, Embase, and Cochrane Central Register of Controlled Trials (CENTRAL), from inception up to the preparation date. Key search terms included combinations of: ("Chronic Kidney Disease" OR CKD OR "End Stage Renal Disease" OR Dialysis OR Transplantation) AND ("Psychological Intervention" OR Psychotherapy OR CBT OR "Cognitive Behavioral Therapy" OR Mindfulness OR "Problem Solving Therapy" OR Counseling).

Inclusion and Exclusion Criteria

Inclusion Criteria. 1) Studies involving patients diagnosed with CKD (Stages 1 to 5, or KRT recipients). 2) Intervention focused on a structured, non-pharmacological psychological intervention (e.g., individual or group therapy). 3) Use of validated outcome measures assessing depression, anxiety, QoL, or coping. 4) Original research articles, including randomized controlled trials (RCTs), quasi-experimental studies, and high-quality observational studies. 5) Manuscripts published in English.

Exclusion Criteria. 1) Studies focusing solely on pharmacological interventions. 2) Case reports, editorials, or reviews. 3) Interventions primarily targeting caregivers or pediatric populations. 4) Studies where the psychological intervention was not the primary focus or where follow-up data were unavailable.

Data Extraction and Synthesis

Data extraction focused on the study design, patient population (CKD stage, KRT modality), intervention type, duration/format, control group comparator, primary outcomes (e.g., change in Δ in Beck Depression Inventory (BDI) scores), and key findings regarding efficacy.

The synthesis process involved thematic analysis of the extracted data, grouping interventions by their theoretical framework (e.g., cognitive-behavioral vs. supportive) and evaluating the consistency and strength of evidence supporting their use in specific CKD populations.

RESULTS

The literature review identified several distinct categories of psychological interventions utilized

in the CKD population. The evidence synthesis is structured based on the primary therapeutic modality examined (Table 1).

Cognitive Behavioral Therapy (CBT)

CBT, focusing on identifying and modifying maladaptive thoughts and behaviors related to illness, emerged as the most extensively studied intervention.

Efficacy in Depression and Anxiety. Multiple RCTs demonstrated that CBT, often adapted for chronic illness management (CBT-I), significantly reduces self-reported symptoms of depression and anxiety compared to usual care or waiting-list controls in both hemodialysis (HD) and pre-dialysis cohorts.[2,5] A meta-analysis comparing various psychosocial therapies noted that CBT consistently yielded moderate to large effect sizes ($g = 0.55$ to 0.72) in reducing depressive symptom severity among ESRD patients.[6]

Delivery Formats. CBT has been successfully delivered via individual sessions (typically 8 to 12 weeks), group formats, and increasingly, through digital platforms. Digital CBT (dCBT) has shown promise, offering flexibility crucial for patients with rigid treatment schedules like those on thrice-weekly HD. The effectiveness of dCBT appears comparable to face-to-face delivery, particularly for symptom management when structured support is provided.[6]

Impact on Self-Management. CBT components focusing on behavioral activation and problem-solving have been linked to improved adherence to fluid restrictions and dietary guidelines, although evidence linking psychological improvement directly to hard clinical endpoints (e.g., hospitalization) remains less consistent.[6]

Mindfulness-Based Interventions (MBIs)

Mindfulness-Based Stress Reduction (MBSR) and Mindfulness-Based Cognitive Therapy (MBCT) focus on non-judgmental awareness of present experience, aiming to decrease reactivity to distressing thoughts.[7]

Evidence Base. Evidence for MBIs in CKD is emerging but less mature than CBT. Studies involving CKD patients reported significant reductions in perceived stress and improvements in sleep quality following an 8-week MBSR program.[7] Furthermore, MBIs appeared particularly beneficial for improving psychological distress in kidney transplant recipients adjusting to immunosuppression and long-term surveillance, suggesting a role in managing uncertainty and health-related fear.[7]

Problem-Solving Therapy (PST)

PST is a structured, directive therapy focused on teaching patients concrete steps to manage specific stressors related to their disease (e.g., scheduling appointments, managing vascular access issues, dealing with fatigue).[8]

Clinical Utility. PST has shown high acceptability among patients who prefer concrete, solution-oriented approaches over purely introspective therapies. A small RCT in peritoneal dialysis patients found PST superior to supportive therapy in enhancing self-efficacy scores related to daily

Summary of Evidence for Key Psychological Interventions in CKD

Intervention Type	Primary Target Population	Typical Duration/Format	Key Efficacy Findings (Primary Outcomes)	Evidence Strength
CBT	Pre-dialysis, HD, Transplant	8 to 12 sessions (individual/group)	Significant reduction in depression/anxiety score, improved self-efficacy	High (multiple RCTs)
dCBT	HD, Pre-dialysis	Self-paced modules with therapist guidance	Comparable efficacy to face-t-face for mood symptoms	Moderate (emerging RCTs)
PST	Peritoneal dialysis, HD	4 to 6 structured sessions	Improved patient ratings of self-efficacy regarding daily management tasks	Moderate (Quasi-experimental/Small RCTs)
MBSR	CKD, Transplant	8 weeks (group format)	Decreased perceived stress and improved sleep quality	Low to moderate (Preliminary studies)
Brief Supporting Counseling	HD (bedside delivery)	Varies (short, unscheduled sessions)	Modest, acute reduction in immediate distress during treatment	Low (observational/pilot data)

management tasks.[8] Its brevity and focus on immediate, manageable problems make it highly practical for integration into standard clinic visits.[8]

Interventions in Specific Populations

HD Patients. HD patients face unique challenges, including treatment schedule rigidity and fatigue associated with the procedure. Interventions in this group often require modification. Brief supportive counseling integrated directly into the dialysis unit (bedside delivery) has shown modest but measurable reductions in acute distress during treatment sessions. Effectiveness is maximized when interventions are brief (under 30 minutes) and tailored to address immediate situational stressors.[9]

Kidney Transplantation. Psychological interventions post-transplant often target adherence to complex immunosuppressive regimens and managing post-transplant anxiety or depression, which can be triggered by medication side effects or fears of rejection. CBT targeting medication beliefs and adherence self-efficacy has demonstrated positive outcomes in reducing unintentional non-adherence rates.[9]

Technological Delivery Models (Telehealth and Mobile Applications)

The logistical challenges of accessing specialized mental health services are substantial for CKD patients. Telehealth delivery, including video conferencing for therapy sessions, has proven viable. Outcomes from tele-CBT mirror those of in-person delivery, significantly boosting attendance rates for geographically isolated or severely fatigued patients.[4]

Mobile Health (mHealth) apps are increasingly used for psychoeducation, symptom monitoring (e.g., mood tracking), and providing just-in-time coping strategies. While robust efficacy data for stand-alone mHealth apps are still accumulating, preliminary studies suggest they can enhance engagement and provide valuable data streams for clinicians regarding symptom fluctuations between appointments.[4]

DISCUSSION

The synthesis of current evidence firmly supports the integration of psychological interventions into the comprehensive management framework for CKD. The high prevalence of psychological distress mandates proactive screening and accessible treatment options, moving beyond the traditional focus solely on biochemical parameters.

Efficacy and Mechanism

CBT remains the cornerstone, demonstrating reliable efficacy in alleviating core symptoms of depression and anxiety across the CKD spectrum. Its effectiveness likely stems from directly addressing cognitive distortions common in chronic illness—such as catastrophizing or feelings of helplessness—and equipping patients with actionable coping skills. The successful adaptation of CBT into briefer, illness-specific modules highlights the potential for scalability in busy clinical settings.

The emerging role of MBIs suggests utility for patients struggling more with emotional regulation and chronic pain/fatigue rather than purely distorted cognition. PST serves as an excellent low-intensity intervention for patients who require practical tools for managing the day-to-day complexities of CKD management.[1]

Implementation Challenges and Future Directions

Despite strong evidence for efficacy, significant barriers impede the routine implementation of these interventions:

Integration and Access. Psychological services are often fragmented, requiring external referrals that CKD patients, especially those on dialysis, struggle to navigate due to transportation issues, scheduling conflicts, or lack of caregiver support.

Reimbursement and Training. Adequate reimbursement models for psychosocial services within nephrology settings are frequently lacking. Furthermore, many nephrology providers lack formal training in recognizing or initiating brief psychological interventions.

Measuring Clinical Impact. While reductions in validated psychological scales (e.g., BDI score reduction by 5 points) are significant, translating these psychological improvements into measurable improvements in mortality, hospitalization rates, or long-term adherence remains a necessary focus

for future, larger-scale RCTs.

Stepped-Care Models

The future likely lies in adopting stepped-care models.

This approach would involve universal screening followed by low-intensity interventions (e.g., psychoeducation, mHealth tools) for mild distress, escalating to high-intensity, specialized therapies (e.g., intensive CBT) for severe or refractory symptoms. Embedding mental health professionals (e.g., health psychologists) directly within multidisciplinary nephrology teams is the optimal model to facilitate rapid referral and integrated care delivery.

LIMITATIONS

This integrative review has inherent limitations. Firstly, heterogeneity across the included studies regarding intervention duration, patient population (e.g., HD vs. transplant), and primary outcome measures made direct comparison difficult.

Secondly, many studies utilized self-report measures for psychological outcomes, which may introduce response bias, though these remain the standard for initial screening. Thirdly, the evidence base for newer modalities, such as personalized digital therapeutics, requires longer-term follow-up studies to confirm sustained benefits compared to established therapies. Finally, economic evaluations assessing the cost-effectiveness of implementing these programs on a large scale are still underdeveloped.

CONCLUSION

Psychological interventions represent an essential, evidence-based component of optimal care for individuals living with CKD. Cognitive Behavioral Therapy demonstrates the strongest empirical support for reducing symptoms of depression and anxiety. The successful adaptation of these therapies via digital platforms and the utility of Problem-Solving Therapy highlight the feasibility of implementation even within the constraints of intensive renal replacement therapies. Nephrology practice must evolve to systematically screen for mental health needs and establish clear, accessible referral pathways, ensuring that psychological well-being is prioritized alongside physiological stability to improve the holistic trajectory of CKD patients.

ABBREVIATIONS

Abbreviation	Definition
BDI	Beck Depression Inventory
CBT	Cognitive Behavioral Therapy
CKD	Chronic Kidney Disease
dCBT	Digital Cognitive Behavioral Therapy
ESRD	End-Stage Renal Disease
HD	Hemodialysis
KRT	Kidney Replacement Therapy
MBCT	Mindfulness-Based Cognitive Therapy
MBSR	Mindfulness-Based Stress Reduction
mHealth	Mobile Health
PST	Problem-Solving Therapy
QoL	Quality of Life
RCT	Randomized Controlled Trial

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Correspondence to:
Simin Adlkhah
M.A. Student in Clinical Psychology
Islamic Azad University, Tabriz Branch, Faculty of Medical Sciences, Tabriz, Iran
Cellphone: 0098 993 581 8285
ORCID ID: 0009-0000-7920-0846
E-mail: ax.simin@gmail.com

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