

Original Article

# Psychotherapies for chronic kidney disease patients with hemodialysis: A systematic review of randomized control trials and quasi-experiments

Zulfa Zahra<sup>1\*</sup>, Elmeida Effendy<sup>2</sup>, Marty Mawarpury<sup>3</sup>, Marthoenis<sup>4</sup> and Indra Jaya<sup>5</sup>

<sup>1</sup>Doctoral Program in Medical Sciences, Faculty of Medicine, Universitas Syiah Kuala, Banda Aceh, Indonesia; <sup>2</sup>Department of Psychiatry, Faculty of Medicine, Universitas Sumatera Utara, Medan, Indonesia; <sup>3</sup>Department of Psychology, Faculty of Medicine, Universitas Syiah Kuala, Banda Aceh, Indonesia; <sup>4</sup>Department of Psychiatry and Mental Health Nursing, Faculty of Nursing, Universitas Syiah Kuala, Banda Aceh, Indonesia; <sup>5</sup>Department of Electromedical Technology, STIKes Muhammadiyah Aceh, Banda Aceh, Indonesia

\*Corresponding author: [dr.zulfa00@gmail.com](mailto:dr.zulfa00@gmail.com)

## Abstract

Chronic kidney disease (CKD) patients, especially those with hemodialysis, frequently struggle with mental health issues like anxiety and depression. Psychotherapy has been known to treat psychological problems, but its effectiveness in managing CKD patients is still rarely scientifically proven. The aim of this study was to analyze the role of psychological treatments in improving the mental health of CKD patients with hemodialysis. We comprehensively reviewed the related studies published in PubMed, Google Scholar, ScienceDirect, and Clinical Key over the last ten years, up to June 7, 2023. A keyword combination was used in the search engine strategies, and all articles about CKD patients receiving hemodialysis and psychotherapy were included. Based on the eligibility criteria, 716 patients were included in 13 out of 18,830 studies in the final analysis. Psychological problem was complained by 399 CKD patients. The psychotherapy included cognitive behavioral therapy (reported in four studies, n=4), diaphragmatic breathing relaxation (n=1), meditation (n=1), hypnotherapy (n=1), Kidney Optimal Health Program (KOHP) (n=1), psychological intervention (n=1), murottal Al-Qur'an therapy (n=3), and spiritual therapy (n=1). These interventions were performed once to four times a week, for ten minutes to five hours during hemodialysis for two to ten weeks. Meditation and KOHP showed no significant improvement in anxiety and depression. The remaining psychotherapies significantly improved the quality of life by reducing anxiety and depression in hemodialysis patients and enhancing sleep quality, self-esteem, hopefulness, medication adherence, and physical condition. In conclusion, psychotherapy should be considered in an interdisciplinary team to treat CKD patients comprehensively. Further studies are still necessary to determine the efficacy of each psychological intervention in CKD patients with psychiatric problems.

**Keywords:** Chronic kidney disease, psychotherapy, anxiety, depression, psychiatric disorder



## Introduction

Chronic kidney disease (CKD) patients are more likely to experience psychological illnesses, particularly depressive disorders and anxiety. Mental health issues are linked to a decreased quality of life, an accelerated progression to end-stage renal disease, long hospitalization, and

high morbidity and mortality in CKD patients [1,2,3]. Hospitalization for psychological problems is 1.5–3 times more prevalent in those patients [4].

The most prevalent psychological problems among CKD patients, especially those receiving hemodialysis, is anxiety and depression [5]. Hemodialysis is an approach of renal replacement therapy used in patients with impaired kidney function [6]. In contrast to pre-dialysis and post-renal transplant patients, dialysis patients had higher rates of depression and hospitalization for psychiatric problems [5,6]. Due to safety reasons and limited data, psychotherapy was recommended in this population instead of antidepressants [7,8].

Despite being quite prevalent in CKD patients, anxiety and depression are underdiagnosed and challenging to treat [5,6]. Psychological therapies assist patients in modifying the patients' view on their illness and minimizing the neuropsychiatric symptoms [9]. Brief psychological interventions, including psychotherapy, have been recommended to treat mild and moderate depression. Combining antidepressants and psychotherapy is also more beneficial than using antidepressants alone in treating moderate and severe depression [10]. Decreasing depression and anxiety levels in hemodialysis patients is a common and beneficial goal of psychotherapy [8].

This systematic review was conducted to analyze the role of the psychotherapy as a potential treatment for CKD patients with hemodialysis who experienced psychiatric disorders.

## Methods

### Eligibility criteria

Studies included in this study complied with population, intervention, control and outcome (PICO) criteria. The study population comprised CKD patients undergoing hemodialysis and receiving psychotherapy for depression or anxiety. A standardized rating scale was used to determine the patients' levels of depression or anxiety. The ages, genders, and races of the patients were not specified. The intervention criteria consisted of psychotherapy sessions of any frequency and duration. The outcome consisted of the changes in standardized depression or anxiety rating scales, including the quality of life. All studies were published over ten years up to June 7, 2023. The included studies were randomized control trials or quasi-experiments, published in English and peer-reviewed. Case reports, commentaries, and editorials were excluded.

### Literature sources and search strategy

A comprehensive literature search was conducted using four electronic databases (PubMed, Google Scholar, ScienceDirect, and Clinical Key). Identical search techniques were applied to each database. Keywords combinations used in search engine strategies were 'psychotherapy and chronic kidney and hemodialysis', 'psychotherapy and kidney disease and hemodialysis', 'psychotherapy and chronic kidney failure and hemodialysis', 'cognitive therapy and chronic kidney and hemodialysis', 'cognitive therapy and kidney disease and hemodialysis', 'cognitive therapy and chronic kidney failure and hemodialysis', 'behaviour therapy or behavior therapy and chronic kidney and hemodialysis', 'behaviour therapy or behavior therapy and kidney disease and hemodialysis', and 'behaviour therapy or behavior therapy and chronic kidney failure and hemodialysis'.

### Study selection and data extraction

The first retrieval assessed the title and abstract of all articles. The second retrieval evaluated full-text articles based on the eligibility criteria. This study complied with the Preferred Reporting Items for Systematic Reviews and Meta-analyses (PRISMA) guidelines for articles collection and findings report [11]. The reference manager used in this study was Mendeley 1.19.4, which cited the selected articles without any duplicates. The extracted data comprised of authors' names, year of publication, sample size, the types of psychotherapy intervention, frequency of psychotherapy sessions, session duration, interventionist, control group, instruments used to measure depression or anxiety, results, and country where the study took place.

## Outcomes

The primary interested outcome of this study were the types of psychotherapy that might be implemented to support the treatment of CKD patients with hemodialysis and the psychological improvement the patients had followed the treatment. This study also interested to the effectiveness of each psychotherapy.

## Results

### Study selection and characteristics

The literature searches from the databases yielded 18,830 studies. After title and abstract screenings, 18,615 studies were excluded. A total of 215 full-text articles were assessed and 202 articles were excluded because did not meet the eligibility criteria. A final 13 articles were included in the final analysis (**Figure 1**).

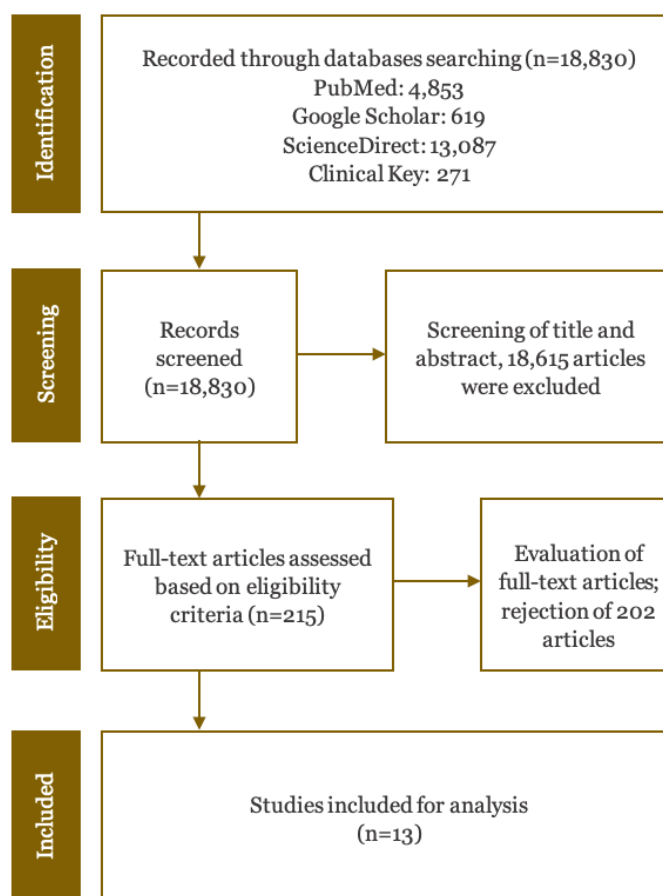


Figure 1. The search and selection processes of the literature according to PRISMA.

### Psychotherapy interventions for chronic kidney disease patients with hemodialysis

There were 716 hemodialysis patients, of which 399 were in the intervention group, and 317 were in the control group. All patients in the intervention group had clinically depression or anxiety and received psychotherapy. The CKD patients were treated with cognitive behavioral therapy in four studies [13-16]: one study with diaphragmatic breathing relaxation [17], one study with hypnotherapy [18], one study with the psychological intervention [19], one study with a psychosocial intervention called Kidney Optimal Health Program (KOHP) [20], one study with mindfulness meditation [21], one study with spiritual therapy [22], and three studies with murottal Al-Qur'an therapy [23-25] (**Table 1**). The control group involved standard care, endurance-resistance training, non-directed counselling, education about CKD, kidney diet, and fluid intake. Depression, anxiety, and quality of life outcomes were measured using validated measuring scores (**Table 1**).

Table 1. Psychotherapies used in the previous studies for chronic kidney disease patients with hemodialysis

Study (authors, year)	Sample size	Psychotherapy intervention	Frequency	Session duration	Duration (weeks)	Interventionist	Control	Instrument	Results	Country
Lerma <i>et al.</i> , 2016 [13]	I=31 C=18	A brief cognitive behavioral intervention	One session a week	2 hours	5	Therapist	Standard care	Beck Anxiety Inventory (BAI) Beck Depression Inventory (BDI)	↓ Anxiety ↓ Depression ↑ The quality of life	Mexico
Chan <i>et al.</i> , 2016 [14]	I=17	Internet-delivered cognitive behavior therapy (iCBT)	5 sessions/8 weeks	≤10 mins	8	Psychologist	-	General Anxiety Disorder-7 (GAD-7) Patient Health Questionnaire-9 Item (PHQ-9) Kessler 10-item Scale (K-10)	↓ Anxiety ↓ Depression ↓ General psychological distress ↓ Disability levels	Australia
Prabha <i>et al.</i> , 2016 [16]	I=33 C=34	Cognitive behavioral therapy	One session a week	50–60 mins	10	Clinical psychological	Received non-directed counselling	Hospital Anxiety and Depression Scale (HADS)	↓ Anxiety ↓ Depression	India
Husein, 2022 [15]	I=58 C=58	Cognitive behavior group therapy	One session a week		9	Therapist	Standard care	Beck Depression Inventory (BDI) General Health Questionnaire (GHQ)	↓ Anxiety ↓ Depression ↑ sleep quality ↑ General psychological health	Iran
Marbun <i>et al.</i> , 2020 [17]	I=6	Diaphragmatic breathing relaxation	Three sessions a week	5 hours during dialysis	2	Therapist	-	Subjective units of discomfort scale (SUDS)	↓ Anxiety	Indonesia
Thomas <i>et al.</i> , 2017 [21]	I=21 C=20	Brief mindfulness meditation	Three times a week	10–15 minutes during hemodialysis	8	Therapist with a Mindfulness-Based Practice Certification	Standard care	General Anxiety Disorder-7 (GAD-7)	Did not statistically significant effects on depression and anxiety	Canada
Wati <i>et al.</i> , 2017 [18]	I=17 C=17	Hypnotherapy	Four sessions a week	45 mins	2	Certified therapist	Health education about CKD and kidney	The Hamilton Anxiety Rating Scale (HARS)	↓ Anxiety ↑ Medication adherence ↑ Adherence to kidney	Indonesia

Study (authors, year)	Sample size	Psychotherapy intervention	Frequency	Session duration	Duration (weeks)	Interventionist	Control	Instrument	Results	Country
Jenkins <i>et al.</i> , 2021 [20]	I=42 C=42	Psychosocial intervention program: Kidney Optimal Health Program (KOHP)	One session a week	60 mins	9	A KOHP-trained facilitator	diet and fluid intake Standard care	Hospital Anxiety and Depression Scale (HADS) Kidney Disease Quality of Life Instrument-Short Form (KDQoL-SF) General Self-Efficacy Scale (GSE) Work and Social Adjustment Scale (WSAS)	diet and fluid intake No significant improvement in Anxiety, Depression, self-efficacy, QoL, work and social adjustment or illness perceptions	Australia
Bargiel-Matusiewicz <i>et al.</i> , 2019 [19]	I= 45 I2=46 C=48	Psychological intervention: The intervention group was subjected to cognitive/narrative intervention. Patients listened to a CD with a recorded intervention and met a psychologist.	Listened to CD Twice a day Met psychologist: twice a week	Listened to CD=20 mins Met psychologist: 1 hour	4	An audio CD that contains a psychological intervention; Psychologist	I2= classical cognitive therapy only listened to a psychological intervention C=Usual care	Beck Depression Inventory, State-Trait Anxiety Inventory (STAI)	↓ Anxiety ↓ Depression	Poland
Mashitah <i>et al.</i> , 2020 [25]	I=14 C=14	Murottal Al-Qur'an	One time a week	45 mins	Two weeks	Therapist (expert in Qur'an therapy)	Standard care	Beck Depression Inventory	↓ Depression	Indonesia
Suhita <i>et al.</i> , 2019 [24]	I=29 C=29	Murottal Al-Qur'an therapy by Surah Ar-Rahman	1–2 times a week	During dialysis process	Four weeks	MP3 players were used to playing the Surah Ar-Rahman recitation. MP3 devices with headphones were used to listen to the	Standard care	Beck Depression Inventory (BDI)	↓ Anxiety ↓ Stress	Indonesia
Frih <i>et al.</i> , 2017 [23]	I=28 C=25	Listening to the Holy Qur'an in combination with endurance-resistance training	Three times a week	20 min (5 min before dialysis and continuing until 15 min	24 weeks	MP3 devices with headphones were used to listen to the	Endurance-resistance training only	Hospital Anxiety and Depression Scale (HADS)	↓ Anxiety ↑ Physical condition ↑ the quality of life	United Kingdom

Study (authors, year)	Sample size	Psychotherapy intervention	Frequency	Session duration after the start of dialysis	Duration (weeks)	Interventionist	Control	Instrument	Results	Country
Darvishi <i>et al.</i> , 2020 [22]	I=12 C=12	Spiritual therapy	Twice a week	60 mins	Six weeks	Interprofessional collaboration in psychological and caring teams	Standard care	Medical Outcomes Study 36-item Short-Form Health Survey (SF-36) Spiritual well-being scale of Paloutzian and Ellison Self-Esteem Inventory of Cooper Smith Self-Efficacy Scale of Sherer	↑ Self-esteem ↑ Medication effectiveness	Iran

I: intervention, C: control, ↑: increasing, ↓: decreasing

The interventions were performed once to four times per week, for ten minutes to five hours, during hemodialysis for two to ten weeks. The outcome parameters were depression, anxiety, and quality of life that were assessed with Hospital Anxiety and Depression Scale (HADS) and Beck Depression Inventory (BDI) in three studies; General Anxiety Disorder-7 (GAD-7) in two studies; and Beck Anxiety Inventory (BAI), Hamilton Anxiety Rating Scale (HARS), Patient Health Questionnaire-9 Item (PHQ-9), Kessler 10-item Scale (K-10), General Health Questionnaire (GHQ), Subjective units of discomfort scale (SUDS), 36-Item Short Form Survey (SF36), General Self-Efficacy Scale (GSE), the Work and Social Adjustment Scale (WSAS), State-Trait Anxiety Inventory (STAI), Kidney Disease Quality of Life Instrument Short Form (KDQOL-SF), Spiritual Well-Being Scale of Paloutzian and Ellison [18-22], the Self-Efficacy Scale of Sherer, and Self Esteem Inventory of Cooper Smith in one study each (**Table 1**).

## Discussion

We identified 399 hemodialysis patients with anxiety or depression who benefited from multiple psychotherapies. The data suggests that psychotherapy, particularly practical and rational therapies like cognitive behavioral therapy, hypnotherapy, psychosocial intervention, psychological intervention, diaphragmatic breathing relaxation, murottal Al-Qur'an, and spiritual therapy, should be considered to treat depression or anxiety in CKD patients with hemodialysis [26].

### Cognitive behavioral therapy

Cognitive behavioral therapy is the most effective and frequent psychotherapy for treating anxiety and depression in hemodialysis patients, improving their adherence to dialysis treatment [8,27]. It is a methodically organized technique to assist patients in rearranging their negative ideas and gaining control over them [27]. Strategies for relaxation, cognitive restructuring, and exposure are the parts of cognitive behavioral therapy, that can be implemented either individually or in groups [8,27].

In four small randomized studies, including hemodialysis patients, the cognitive behavioral therapy group considerably improved their depression [2,9,11,12]. The patients who underwent cognitive behavioral therapy experienced improvements in their sleep issues, general psychological health, and decreased oxidative stress and inflammation [24,25]. Cognitive behavioral therapy, along with physical activity, might help dialysis patients' anxiety. It should be included in hemodialysis treatment by qualified mental health specialists [8,27].

### Diaphragmatic breathing relaxation

Diaphragmatic Breathing Relaxation is a method that lessens anxiety by improving autonomic arousal. Since breathing becomes quick and shallow in anxiety, the patients were instructed to breathe more deeply and slowly by using the diaphragm muscle in each breath to deliver oxygen to the lungs. By breathing more calmly, diaphragmatic breathing decreases anxiety [17].

A study research demonstrated that diaphragmatic breathing relaxation had a soothing impact and stabilized the autonomic nervous system [30]. Another study reported that CKD patients who demonstrated diaphragmatic breathing relaxation six times were more relaxed and better controlled the autonomic arousal symptoms, including stiff muscles, quick heartbeat, cold hands, and rapid breathing [17].

### Hypnotherapy

Hypnotherapy has effectively treated a wide range of psychological and psychiatric illnesses, including anxiety, stress, phobias, sleep disorders, and mental health issues. During hypnotherapy sessions consisting of induction and deepening, the therapist will lead the patient from the mindful to the subconscious mind. The original beta-wave brain waves eventually transition into alpha waves when the patient enters a deeper hypnotic trance. Under alpha conditions, the brain will release serotonin and endorphins, causing the patient to feel relaxed, at ease, and pleased. These hormones strengthen the body defense against infection, widen blood vessels, regulate pulse, and enhance sensory perception. When a person receives hypnotherapy, The brain's reticular activation system is stimulated, resulting in an autonomic nerve response,

including controlled feelings, emotions, and anxiety, as well as a pulse, breath frequency, and blood pressure [18].

The sympathetic hormone will be inhibited by relaxation, lowering the hormones contributing to body dysregulation. The parasympathetic nervous system, which has a reverse work function of the sympathetic nerves, will lessen the functioning of the organs. The heart rate, muscle tension, breathing rhythm, blood pressure, and the release of hormones that contribute to stress are diminished. Because of the relaxation by hypnosis therapy, the brain will change from alpha to theta waves in a hypnotic state. The wave frequency increases in rhythm and regularity, which stimulates the brain to produce endorphins, GABA, enkephalin, and other neurotransmitters that have the dual purpose of reducing anxiety and having a calming impact [18].

Hypnotherapy also helps the patients cope with the distraction of their concern over their condition. Endorphin is released in response to pleasurable sensory stimulation and blocks the transmission of anxious sensations to the brain. Hypnotherapy lowers anxiety and emotional intensity. A study that performed hypnotherapy eight times in two weeks on hemodialysis patients showed that hypnotherapy improved anxiety, treatment compliance, kidney diet, and fluid intake in individuals with CKD [18].

### **Psychosocial intervention**

A psychosocial intervention plan, called Kidney Optimal Health Program (KOHP), was created after a study in 2020. Based on a structured workbook, the KOHP was presented in nine successive sessions (8 + 1 booster session), held a session a week for an hour [20]. A KOHP-trained facilitator was assigned to each participant to lead the intervention [20].

Session 1 was about the six pillars of "optimal health," which consider a person's balance of physical, emotional, mental, occupational, social, and spiritual demands. Analysis of the consequences and future issues of CKD and dialysis in terms of strengths and vulnerabilities was delivered in session two. Analysis and monitoring of illness effects were explained in session 3. Sessions 2 and 3 served as the beginning of creating a health plan. The management of medications and metabolic monitoring were the main topics of session 4. In session 5, the health plan was enhanced to incorporate significant CKD treatment collaborations and online and community-based support systems. In session 6, the ways to improve the patient's condition by creating new and proactive paths were discussed. The purpose of session 7 was to develop goals through inventive problem-solving and planning in light of the difficulties associated with renal failure and dialysis. Session 8 was conducted to discuss sustainability and wellness maintenance strategies for managing and treating CKD. Evaluating health plans and reflecting on accomplishments towards health-related goals were part of the "booster session" (session 9), which was intended to consolidate progress [20].

This study revealed that KOHP did not significantly enhance dialysis patients' perceptions of their illnesses or anxiety, depression, self-efficacy, quality of life, or job and social adjustment [20].

### **Meditation**

Mindfulness meditation has been popular recently to help patients have moment-to-moment and nonjudgmental awareness. Numerous psychiatric disorders, including those with chronic physical ailments, have shown significant improvement with this technique.

A study in 2017 found no statistically significant effects of brief mindfulness meditation on the scores of depression and anxiety symptoms, which was associated with a small sample size. Future studies on mindfulness in hemodialysis patients should involve more participants and control groups, specify the severity of the patients, and evaluate qualitative metrics to achieve more accurate efficacy [21].

### **Murottal Al-Qur'an therapy**

Murottal is a recorded Qur'anic recitation, sung by a Qori (a skilled Al-Qur'an reciter). Murottal Al-Qur'an might lessen anxiety by shifting the patients' focus while listening to the murottal. This therapy is advised as the supporting treatment for illnesses in Muslims by calming the patients down and accelerating the healing process.



A study reported that murottal Al-Qur'an Surah Ar-Rahman was more successful in reducing anxiety and blood pressure in CKD patients with hemodialysis than relaxation therapy. This indicated that the patient is comfortable, focused, and able to control their anxiety. Listening to the calming murottal might stimulate the brain to release more endorphins, which reduces perceived anxiety and normalizes brainwaves [24].

Another study showed that depression in CKD patients with hemodialysis was effectively treated by listening to murottal Al-Qur'an twice, separated by one week, without medications [25].

### **Spiritual therapy**

Physical and psychological health are impacted by spirituality and religion. The consequences of daily stress can be offset by spirituality, improving one's health and quality of life comprehensively. Spiritual therapy includes reading the religious holy books, praying, participating in religious-spiritual programs, repenting, forgiving, and analyzing moral values spiritually [22,31].

Spiritual therapy might enhance hemodialysis patients' spiritual well-being, self-esteem, hope, and self-efficacy. Considering the disease impacts and the consequences of hopelessness for quality of life, treatment adherence, and recovery, the care-providers are suggested to enhance the physical, psychological, and spiritual aspects of the patient's lives through interdisciplinary involvement in psychological and caregiving teams [22,31].

### **Conclusion**

Psychotherapy might improve psychiatric problems in CKD patients by improving quality of life, medication adherence, and symptoms of depression and anxiety. However, religious and spiritual psychotherapy are still rarely studied to treat CKD patients with psychiatric problems. Interdisciplinary involvement in psychological and caregiving teams is necessary to comprehensively treat CKD patients, especially those with hemodialysis.

### **Ethics approval**

Not required.

### **Competing interests**

The authors declare that there is no conflict of interest.

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### **Underlying data**

All data underlying the results are available as part of the article and no additional source data are required.

### **How to cite**

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