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## Chapter

# Psychosocial Aspects in Hemodialysis

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## Abstract

Several psychosocial stressors have an impact on patients with end-stage kidney disease (ESKD). The disease and its treatment modalities impose several lifestyle changes. These include the impact of disease and treatment, dietary and fluid restrictions, functional limitations and sexual dysfunction, and future uncertainty and fear of death. Furthermore, family and social issues such as changes in family roles and changes in duties and responsibilities may add to psychosocial stressors among people on dialysis. Commonly associated psychosocial issues include depression, anxiety, delirium, withdrawal, and decreased quality of life. The prevalence and severity of each psychological issue vary, and there are several tools available to detect these issues. This chapter will focus on the most common psychosocial stressors among people with hemodialysis.

**Keywords:** anxiety, depression, delirium, hemodialysis, psychosocial issue, stressors, withdrawal

## 1. Introduction

Over the past three decades, significant advancements in the knowledge of and understanding of the treatment of end-stage kidney disease (ESKD) have been made. According to the biopsychosocial model, which is linked to ESKD, dialysis has biological, psychological, and social consequences [1]. However, many studies focus on the biological effects of dialysis, and little attention has been given to psychosocial issues in hemodialysis. The psychosocial stressors that patients undergoing dialysis therapy face are numerous. Based on the psychosocial model, each person is unique, and his or her stressors interact with each other, which illustrates their complexity [1].

Several psychosocial stressors have an impact on patients with ESKD. The disease and its treatment modalities impose several lifestyle changes. These include the impact of disease and treatment, dietary and fluid restrictions, functional limitations and sexual dysfunction, and future uncertainty and fear of death. Furthermore, family and social issues such as changes in family roles and changes in duties and responsibilities may add to psychosocial stressors among people on dialysis. Some of these stressors among dialysis patients may cause changes in patients' marital and occupational status, which lead to isolation and decrease quality of life. Commonly associated psychosocial issues include depression, anxiety, delirium, and withdrawal from dialysis. These stressors may differ in their occurrence and manifestation according

to the time of the dialysis. Understanding these issues and their impact on patients undergoing dialysis therapy will have positive implications for clinical practice and patients' outcomes. Priority should be given to prevention and early identification of these issues throughout the trajectory of the dialysis treatment. This chapter will focus on the most common psychosocial issues among people on hemodialysis.

## **2. Psychosocial issues in the transition to hemodialysis**

The actual transition from chronic renal care to hemodialysis therapy results in a new challenge for patients' lives across all aspects [2]. This transition period is critical and associated with many psychological stressors. Future uncertainty, being a burden on family, financial strain, transportation issues, physical dysfunction, lifestyle and schedule changes, and travel restrictions are all sources of psychological stressors. In fact, many patients experience shock when they are told to start dialysis [3]. This initial shock event can lead to a serious psychological crisis. The patient may experience denial, regret, depression, anxiety, worry, anger, sleep disturbances, grief, and isolation [4]. Moreover, newly commenced dialysis patients may experience identity alterations because of altered body image, dependence, frailty, and loss of identity [5]. During the initial hemodialysis, patients often deny the fact that dialysis has become part of their lives and is a permanent treatment [6]. Denial is regarded as a protective mechanism for dealing with emotional stressors associated with dialysis [7]. Denial may lead to a refusal to adhere to dietary and fluid restrictions and a testing of what happens when they break boundaries. In some cases, this may lead to withdrawal or decreased compliance with dialysis [7]. A previous study reported a correlation between withdrawal and early dialysis initiation [8]. The first year on hemodialysis is a central period for adaptation and coping [5]. Perhaps it is only a matter of time before the patient accepts the fact that dialysis is sustaining their life. Indeed, when patients' health deteriorated significantly, they eventually accepted the reality of dialysis and followed the instructions.

In a qualitative study that explored patient experience after the first year of dialysis, family and dialysis acceptance and coping were the dominant psychosocial stressors [2, 5]. Patients feel that hemodialysis affects social interaction and changes their relationships. Furthermore, physical and psychosocial functions affect their ability to work and be independent. Studies show that the first years of initiating hemodialysis are associated with changes in employment status and reduce the income [9, 10]. Given this, depression and social isolation may become apparent until the patient accepts and adapts to the new treatment [5].

Transitioning from other treatment modalities, such as peritoneal dialysis, to hemodialysis is required in some cases. This transition also imposes some psychological issues [11]. Patients are frequently hesitant to accept or change a treatment at first [11]. These patients may also experience similar psychological issues (e.g., depression, fear, and anxiety) as patients who have been transferred from pre-dialysis care to hemodialysis for the first time.

### **2.1 Psychosocial care in the initial period of hemodialysis**

Assessment of psychological status should be an integral part of hemodialysis care, especially during the transition period. To facilitate a healthy transition to hemodialysis, clinicians should be alert during this critical period for any changes in

emotion and mood and provide social and emotional support [2]. A patient-centered approach of care should be applied through individual evaluation of each patient to meet his or her supporting needs. It is critical to provide effective training and educational programs for patients and their families in order to improve acceptance and coping with hemodialysis. Moreover, providing opportunity to share experience and talking to other patients on dialysis will help in this regard.

New patients may be reluctant to ask questions or express their feelings. Establishing a trust relationship between patients and healthcare professionals improves the patient experience and facilitates coping mechanisms [5]. This relationship will enable information sharing, promote self-efficacy and management, support decision-making, and reduce depression and anxiety.

### **3. Depression**

Depression is a common mental disorder worldwide. According to the American Psychiatric Association, depression is a common illness that negatively affects feelings, thinking, and responses [12]. It is an emotional state marked by somatic and cognitive symptoms [13]. Depression is often known as major depressive disorder or clinical depression, which is widely underreported and underdiagnosed in many chronic illnesses.

The National Institute of Mental Health indicates that depression has various types [14]. These are major depression, persistent depressive disorder, perinatal depression, seasonal affective disorder, and depression with symptoms of psychosis. The major depression is defined by symptoms that last at least 2 weeks and interfere with daily activities. More specifically, the Diagnostic and Statistical Manual for Mental Disorders (DSM-5) in its latest version indicates that the diagnosis of a major depressive disorder should have two criteria. First, the symptoms should continue for a period of at least 2 weeks. Second, depressed mood should be experienced almost daily or be accompanied by a loss of interest in routine activities, as well as at least four of the additional symptoms listed below: (a) significant change in weight (either loss or gain) or change in appetite, (b) alteration in sleep pattern (e.g., insomnia), (c) psychomotor changes (i.e., agitation or retardation), (d) fatigue and loss of energy, (e) feelings of worthlessness or extreme guilt, (f) decreased concentration, or (g) thoughts of death or suicide [15]. Cohen et al. noted that many of these symptoms that are associated with major depression could overlap with uremic symptoms in ESKD [16]. However, death and suicidal thoughts are more likely to be related to major depression. It is therefore important that clinicians be careful when they assess depression in this specific population.

The other type of depression is persistent depressive disorder, which is also called dysthymia, and is characterized by a lower severity of the depressive symptoms but a longer duration, typically at least 2 years. Perinatal depression is experienced by women and associated with specific times such as pregnancy and the postpartum period. Seasonal affective disorder has been linked to particular seasons. The last type is depression with symptoms of psychosis, which is the most severe type of depression in which psychosis symptoms also occur.

Depression in hemodialysis is contributed by numerous changes in the personal, social, and professional aspects, such as job loss, dietary changes, and sexual dysfunction, in addition to the frequent stressful experience of dialysis, the invasive procedure of dialysis, issues related to dialysis access, uncertainty about the future,

and anxiety regarding mortality. The adverse outcomes of depression among hemodialysis have been widely examined. Previous studies indicate that depression among dialysis patients is associated with poor treatment adherence [17, 18], high hospitalization rates [19], and lower quality of life [20, 21]. There is growing evidence that the depression is correlated with increased risk of mortality rates in hemodialysis [19, 21–24]. Cheng et al. found that cognitive symptoms of depression have a better predictive value of long-term mortality in people undergoing hemodialysis than somatic symptoms [25]. Collectively, the adverse effects of depression make it an important subject to address.

Globally, depression affects approximately 5% of adults and is the principal cause of disability [26]. Moreover, it is one of the most common mental disorders among hemodialysis patients. The prevalence of depression varies among countries. However, a large body of literature shows that depression affects about one-quarter of dialysis patients [27–29]. In the USA, the prevalence of depression among hemodialysis patients ranges between 14 and 44% [30, 31], and in Australia, it was found to be about 13.3% [32]. A multinational European study conducted in Portugal, Turkey, Italy, and France that examined depression among 2278 people with hemodialysis reported a prevalence as 46% [33]. Depression rates in Saudi Arabia ranged from 5.62% to 44.7% [34, 35]. Depression in hemodialysis was much higher in Africa, as it ranged between 45 and 76.3% [36]. The variation across these studies was due to the potential for variation in methodological designs applied and assessment measures utilized, in addition to other factors such as sex, race, educational level, and economic status.

### **3.1 Screening and diagnostic measures**

There are several measures available to diagnose and screen for depression in hemodialysis units. The semistructured interviews are considered the gold-standard method of diagnosis for depression. These include the Mini International Neuropsychiatric Interview and the Structured Clinical Interview for DSM-IV Axis I Disorders (SCID-1) [37]. These types of interviews should be conducted by well-skilled healthcare professionals who are familiar with the criteria for the diagnosis of major depression mentioned previously.

Given the dramatic changes in all aspects of life for people undergoing hemodialysis, it is recommended to screen for depression at the time of initiation, after 6 months, and then yearly [38]. It is also supported by prior evidence demonstrating that there is no correlation between any specific time since the commencement of dialysis and the occurrence of depression [39]. This requires ongoing examination of depression in hemodialysis patients throughout their treatment trajectory. Currently, the Beck Depression Inventory, Patient Health Questionnaire (PHQ-9), Center for Epidemiologic Studies Depression Scale (CES-D), and Hospital Anxiety and Depression Scale (HADS) are valid and reliable measures for screening of depression the dialysis population. Although the best one to use remains uncertain. These measures differ in their lengths and items, which make some of them more efficient for initial screening of depression.

The most commonly used measure to assess depression is the Beck Depression Inventory (BDI). It has been extensively used in screening patients with ESKD [40]. The BDI was developed in 1961 and consisted of 21 items [41]. Over time, the scale has been revised to be updated according to the new guidelines and diagnostic criteria for psychological disorders issued by the American Psychiatric Association. The

first version of BDI (BDI-I) was published in 1987. Then, the second version of BDI (BDI-II) was available in 1996 and included 21 items as well as a few items revised [41]. This scale evaluates responses on a 4-point Likert scale, where 0 means that no problem exists and 3 means that the problem is highly prevalent. The maximum score of the BDI-II is 63. The severity of the depression was classified based on the range of scores given. When the BDI-II score ranges from 0 to 13, it is considered minimal depression. When the score is between 14 and 19, it indicates mild depression. When a person's BDI-II score ranges from 20 to 28, they may be suffering from moderate depression. Severe depression is classified when the BDI-II score ranges from 29 to 63 [42]. In addition, a cutoff score of  $\geq 11$  was identified as sensitive point for determining the major depressive episode among patients with chronic kidney disease [43]. The BDI-II is a well-validated scale that has been widely used to assess depression in people undergoing dialysis [44–49].

The latest version of BDI is known as BDI-FS, which is fast and short and includes only seven items. The scale of scoring is 0–3. The value of this version is to accelerate the screening for depression. This quick scale may be useful in identifying potential hemodialysis patients who are depressed [36, 50], and once identified, further testing should be performed to validate the diagnosis and initiate the appropriate intervention.

It was argued that developing a tool that focuses on non-somatic disturbances associated with depression while excluding somatic symptoms that could be caused by dialysis is critical. Accordingly, the Cognitive Depression Index (CDI) was developed by selecting a subset of 15 items from the BDI-II and excluding those related to somatic symptoms [37, 51]. The significance of this index was emphasized by both Kimmel et al. and Peterson et al., who found a correlation between high depression using CDI and increased mortality rates and lower survival rates in chronic kidney disease [52, 53].

Additional short and fast tool for screening of depression is the Patient Health Questionnaire (PHQ-9). It is a self-reported survey that includes nine items specific to depression. The responses are scored on a 4-point scale to indicate the severity of depression, with 0 for a statement indicating not at all and 3 indicating experience with a statement of nearly every day. A maximum score assumed for the PHQ-9 is 27. Using this measure, depression is classified into four categories. A score range between 1 and 4 indicates that there is no depression, a score range between 5 and 9 indicates a mild depression, a score range between 10 and 14 indicates a moderate depression, a score range between 15 and 19 indicates a moderately severe depression, and a score of 20 or more indicates a severe depression [54]. A previous study suggested that a cutoff point of 10 on the PHQ-9 is sensitive to detecting depressed patients [55]. As the PHQ-9 is also short, it is recommended to use it as a screening tool for depression in dialysis units.

Another well-known measure for assessing depression in hemodialysis is the Hospital Anxiety and Depression Scale (HADS). It was developed in 1983 by Zigmond and Snaith to evaluate both anxiety and depression levels in the outpatient units of the hospital [56]. HADS is a relatively short and quick instrument. It is a self-reported survey with 14 multiple-choice questions that have two subscales: anxiety (HADS-A) and depression (HADS-D). Each subscale includes seven items rated on a four-point scale (from 0 to 3), where 0 indicates the absence of the problem and 3 indicates the presence and severity of the problem. The maximum score given is 21. A score of 7 or less means absence of anxiety or depression; a score between 8 and 10 represents moderate levels of anxiety or depression; and score more than 11 reveals

high levels of anxiety or depression. The HADS is a valid tool, and extensive studies show that HADS is practical in the assessment of anxiety and depression among people undergoing hemodialysis [57–61].

Center for Epidemiologic Studies Depression Scale (CES-D) is one of the most common instruments used to assess depression. The Center for Epidemiological Studies-Depression (CES-D) created this scale to assess depression in 1977 by Radloff [62]. It comprises 20 items that evaluate the mood and somatic symptoms, interpersonal relationships, and motor functioning in the past week. The total score of the scale ranges from 0 to 60, with a higher score revealing worse psychological status. A cutoff value of  $\geq 16$  was approved to indicate depression. The scale was validated and used in many studies for patient undergoing hemodialysis [37, 63]. Other screening measures have been used to assess depression among hemodialysis patients using non-specific tools and parts of other tools, such as the Kidney Disease Quality of Life Questionnaire (KDQOL-SF), the SF-36, the Mental Health Inventory 5, and the Edmonton Symptom Assessment System.

It is important to notice that using self-reporting scales could result in overdiagnosis, especially among patients on dialysis. The daily symptoms experienced by those patients (e.g., fatigue, sleep disturbance, and difficult concentration) can overlap with the somatic symptoms of depression. Besides the symptom burden, the occurrence of other comorbid conditions may add to the complexity of the depression diagnosis in a patient on dialysis.

### **3.2 Management of depression in hemodialysis**

The diagnosis and treatment of depression in hemodialysis are crucial because untreated depression is associated with poor adherence to management, increased morbidity and mortality rates, and a low quality of life among people undergoing hemodialysis. Generally, the management of depression has been classified into pharmacological and nonpharmacological interventions. Management approaches should be adapted to the patient's unique needs (e.g., treatment history, concurrent illnesses, and preferences of the patients and their family) and consider the resources available in the dialysis facilities [38].

#### *3.2.1 Pharmacological treatment*

Antidepressant drugs have been shown to be effective in treating depression in the general population [64]. However, in dialysis, this is still ambiguous. For safety concerns and the possibility of serious adverse events, there are few antidepressant trials conducted among hemodialysis patients to support their efficiency. The pharmacokinetics of antidepressant drugs in hemodialysis are likely to be affected due to several factors. In fact, the metabolism of antidepressant drugs is such that these drugs frequently go through the liver, and the active metabolites are eliminated by the kidneys instead [38]. Impaired kidney functions negatively influence the excretion process, which causes buildup toxic concentrations of the drug in the body. In addition, since antidepressants are typically heavily protein bound, dialysis does not significantly eliminate them from the body [38, 64]. Moreover, there is a high risk of drug-drug interactions in dialysis patients due to the polypharmacy taken for the treatment of kidney failure and associated comorbidities [38].

The selective serotonin reuptake inhibitors (SSRIs) are the most common antidepressant drugs to use [36]. In hemodialysis, the SSRIs are still under debate [36, 65].

Both meta-analyses and a recent systematic review revealed that the evidence related to SSRIs is not sufficient, and the findings are contradictory [66, 67]. Some placebo-controlled trials show low or ungradable benefits [66, 67]. Among the SSRIs, fluoxetine is the most researched, with a daily dose of 20–60 mg considered tolerable [16, 68]. Another review has focused on the use of sertraline in hemodialysis and found that the use of sertraline appears to be safe but needs more investigation [69]. A double-blind randomized clinical trial found that sertraline has improved pruritis intensity in hemodialysis patients [70]. Other examples of drugs in the same class are citalopram, escitalopram, fluvoxamine, and paroxetine. Despite the fact that there is insufficient evidence to support the efficacy of SSRIs in hemodialysis patients, they have fewer anticholinergic and cardiac side effects than other drugs, such as tricyclic antidepressants (TCAs), which adds to their privilege [65]. Further, a recent systematic review found that side effects for SSRIs were minor, such as fatigue and nausea [66]. Another reported side effect of SSRIs is an increased risk of bleeding, which requires cautious use in patients with platelet dysfunction [16]. Importantly, patients should be observed for any suicide attempts, as a risk of suicide during the SSRI treatment may potentially occur during the initial administration [39]. The initial treatment should be started with a low dose, and the clinical effects should be monitored closely for at least 4–6 months [16]. If the result is suboptimal, the dose may be increased or the drug changed [16, 65].

Selective norepinephrine reuptake inhibitors, such as venlafaxine and bupropion hydrochloride, are examples of a different class of antidepressants that are also used with caution [16, 39]. Monoamine oxidase inhibitors are used, but not preferred as they have many side effects, especially hypotension [16]. **Table 1** summarizes the antidepressant drug classes and recommended dosing in patients undergoing hemodialysis [68].

We should notice that depression could happen due to multiple factors, including triggers of other symptoms such as fatigue, sleep disturbance, and sexual dysfunction [71–74]. Given this, clinicians should comprehensively assess the potential correlating factors before prescribing any antidepressant medications. The possible management of depression may be conducted indirectly through the management of the source of the issue.

### 3.2.2 *Nonpharmacological interventions*

The optimal care to enhance mental health includes nonpharmacological interventions as a key component to reduce stress, improve cognitive function, and enhance coping. Nonpharmacological interventions have been considered due to safety concerns and a lack of evidence about the efficacy of pharmacological regimens for depression in hemodialysis patients. In contrast, many studies have shown that using these alternative approaches has significant clinical outcomes in the treatment of depression in hemodialysis patients [75–79]. These include cognitive behavioral therapy (CBT), psychoeducation, exercise programmes, relaxation training, acupuncture therapy, self-management, problem-solving, meditation and laughter therapies, and mindfulness-based stress reduction [36, 38, 66, 68, 80].

Cognitive behavioral therapy (CBT) is a common psychotherapy approach to depression treatment. The main principle of CBT focuses on resolving the cognitive factors that lead to psychological distress, such as coping and acceptance. It is based on an organized approach to encourage the restructuring of negative ideas, improve mental status, and enhance behavioral adaptations [68]. A growing body of evidence supports



Medication class	Medication	Recommended dose	Class adverse effects
Monoamine oxidase inhibitor	Isocarboxacid	30–60 mg daily, in single or divided doses	Significant drug-drug interactions, risk of hypertensive crisis with tyramine-rich food, orthostatic hypotension
	Phenelzine	45–90 mg daily, in three divided doses	
	Tranlycypromine	30 mg daily, increase with caution	
	Selegiline	5 mg daily	
Tricyclic antidepressants	Clomipramine	10 mg daily, increase with caution	Prolonged QT syndrome, arrhythmias, orthostatic hypotension, central nervous system and anticholinergic effects
	Desipramine	25 mg daily, increase with caution	
	Lofepamine	140 mg daily, in two divided doses, increase with caution	
	Nortriptyline	30–150 mg daily, in single or divided doses	
	Amitriptyline	75–200 mg daily	
	Amitriptylinoxide	15–150 mg daily	
	Dibenzepine	240 mg daily, increase with caution	
	Dosulepine	75 mg daily, increase with caution	
	Doxepine	10–300 mg daily, maximal single dose 100 mg	
	Imipramine	10 mg daily, increase with caution	
	Protriptyline	15 mg daily, increase with caution	
	Mianserin	30 mg daily, increase with caution	
	Amoxapine	75–400 mg daily, in single or divided doses	
	Maprotiline	50 mg daily, increase with caution	
Selective serotonin reuptake inhibitors	Citalopram	10–40 mg daily	Increased risk of bleeding, nausea, diarrhea, central nervous system effects, sexual dysfunction
	Escitalopram	10 mg, increase with caution	
	Fluvoxamine	50–300 mg daily, maximal single dose 150 mg	
	Fluoxetine	20–60 mg daily	
	Paroxetine	10 mg daily, increase with caution	
	Sertraline	25 mg daily	

Medication class	Medication	Recommended dose	Class adverse effects
Serotonin/norepinephrine reuptake inhibitors	Venlafaxine	37.5–112.5 mg daily, in three divided doses	Hypertension, sexual dysfunction, neuroleptic malignant syndrome, serotonin syndrome
	Desvenlafaxine	25 mg daily	
	Duloxetine	40 mg daily, increase with caution	
	Milnacipran	25–50 mg daily	
Serotonin modulators	Nefazodone	100 mg daily, increase with caution	Cardiac dysrhythmias, Steven-Johnson syndrome, liver failure, serotonin syndrome, priapism
	Trazodone	150 mg daily, increase with caution	
Noradrenergic and serotonergic agonist	Mirtazapine	15 mg daily, increase with caution	Central nervous systems effects including somnolence, weight gain
Norepinephrine dopamine reuptake inhibitors	Bupropion	150 mg daily	Accumulation of toxic metabolites, cardiac dysrhythmia, wide QRS complex, nausea, insomnia, dizziness
Dopamine receptor agonist	Trimipramine	150 mg daily, increase with caution	Sedation (especially common with trimipramine compared to the other tricyclics), anticholinergic effects
Reversible monoamine oxidase inhibitor	Moclobemide	300–600 mg daily, in three divided doses	Nausea, dry mouth, constipation, insomnia, dizziness, anxiety, restlessness
Selective serotonin re-uptake enhancer	Tianeptine	12.5–25 mg daily	Insomnia, dry mouth, nausea, headache, constipation, drowsiness, weight gain
Melatonergic antidepressant	Agomelatine	5–50 mg daily	Sweating, gastrointestinal side effects, insomnia, anxiety, elevated liver enzymes
Selective norepinephrine reuptake inhibitor	Reboxetine	4–6 mg daily, in 2–3 divided doses	Insomnia, dry mouth, nausea constipation, sweating, tachycardia

*Adapted from Ma et al. with permission [68].*

**Table 1.**  
*Antidepressant medication classes and dosing in dialysis patients.*

the clinical effectiveness of CBT for depression management in hemodialysis. Eight randomized placebo-controlled trials examining the efficacy of CBT were examined in a meta-analysis study, and the results showed that CBT was successful in easing depressive

symptoms in hemodialysis patients [81]. However, this approach requires face-to-face psychotherapeutic intervention, which may be difficult for this population. Therefore, it has been suggested that internet-delivered self-help CBT (ICBT) would be a promising approach to the management of depression [82]. Other proposed nonpharmacological interventions yet need further investigation to draw conclusions about their efficacy.

#### 4. Anxiety

Anxiety is another frequent and overlooked psychiatric disorder in patients undergoing hemodialysis. Less clinical attention has been given to anxiety in hemodialysis compared with depression [39]. It is defined as anticipation of a potential danger or threat [83]. Anxiety is an emotional condition characterized by excessive nervousness, fear, worry, and tension [84]. It may also cause physiological manifestations such as sweating and an increase in heart rate and blood pressure. According to American Psychiatric Association, there are different types of anxiety disorder, which include generalized anxiety, panic disorder, phobia, agoraphobia, social anxiety disorder, and separation anxiety disorder (**Table 2**), [84]. When anxiety exceeds what would be predicted given a usual response to a certain incident, its severity and duration are considered disorders. Most anxiety disorders have a minimum 6-month duration, and the severity is considered excessive compared with the real level of threat [83]. Studies have found that anxiety is often associated with depression [80, 85]. Thus, other psychiatric disorders (e.g., depression and post-traumatic stress disorder) may display anxiety as a diagnostic sign [83].

Type	Characteristics
Generalized anxiety	<ul style="list-style-type: none"> <li>• Persistent and excessive worry for at least six months</li> <li>• Beside the psychological symptoms, it involves physical symptoms, such as restlessness, difficulty concentrating, muscle tension, or sleep issues.</li> </ul>
Panic disorder	<ul style="list-style-type: none"> <li>• Involve recurrent, sudden panic attacks</li> <li>• Combine extremely distressing physical and mental symptoms</li> </ul>
Phobia	<ul style="list-style-type: none"> <li>• Excessive and persistent fear of a specific object, situation, or activity</li> </ul>
Agoraphobia	<ul style="list-style-type: none"> <li>• Fear of being in circumstances where getting out would be challenging or embarrassing, or where getting aid might be difficult in the event of panic attacks. This extreme fear appears in two or more of the following situations: <ul style="list-style-type: none"> <li>• Using public transportation</li> <li>• Being in open spaces</li> <li>• Being in close places</li> <li>• Standing in line or being in a crowd</li> <li>• Being outside the home alone</li> </ul> </li> </ul>
Social anxiety disorder	<ul style="list-style-type: none"> <li>• It is associated with intense worry and discomfort about social activities and situations. The worry or anxiety lasts for at least six months and interferes with daily functioning.</li> </ul>
Separation anxiety disorder	<ul style="list-style-type: none"> <li>• Excessively nervous or afraid of being parted from persons to whom they are attached.</li> </ul>

**Table 2.**  
*Types of anxiety disorder.*

#### **4.1 Screening and diagnostic measures**

There are limited studies reporting the prevalence of anxiety and its associated factors among patients undergoing hemodialysis. Anxiety prevalence ranges from 25.9–50% [20, 80, 85–87]. The discrepancy in range is probably due to variations in the applied methodology for screening for anxiety and the diversity of patient populations. Some studies rely on a general measure designed for symptom assessment that includes anxiety as one component, such as the Dialysis Symptom Index and the Chronic Kidney Disease Symptom Burden Index [88, 89]. Others use specific measures for anxiety assessment, such as HADS, the Beck Anxiety Inventory, and the Primary Care Evaluation of Mental Disorders (PRIME-MD). The BAI contains 21 items based on a 4-point Likert scale that examine the severity of anxiety [90]. Each question is scored between 0 (not at all) and 3 (severely it bothered me a lot). A high score suggests an increased level of anxiety symptoms. Low anxiety is indicated by a score between 0 and 21. A score range of 22–35 indicates moderate anxiety, while a score of 36 or above indicates a severe anxiety level [90]. The BAI is a valid and reliable measure. The psychometric analysis showed a high level of internal consistency, and the discrimination validity of the scale was demonstrated when it differentiated between those who were anxious and those who were not anxious but had other psychiatric issues, such as depression [90]. Numerous studies used the BAI to assess anxiety levels among patients undergoing hemodialysis [91–94]. Nadort et al. compared the diagnostic accuracy of BAI and HADS and concluded that both scales were valid for anxiety screening in hemodialysis but that HADS is more useful in routine dialysis care [95]. Regarding the PRIME-MD, it is one of the primary screening tools for mental health. It consists of two parts. The first part is a one-page questionnaire (PQ) that should be filled out by the patient, and the second part is a 12-page clinician evaluation guide that should be completed by clinicians using a structured interview form [96]. The PRIME-MD-PQ is a self-administered tool that contains 26 questions based on yes/no choices regarding the existence of symptoms related to mood, anxiety, somatoform, eating disorders, and alcohol abuse [96]. Some studies use the PRIME-MD to assess anxiety in hemodialysis [97, 98].

A semistructured clinical interview was also used for anxiety diagnosis. The prevalence of moderate-to-high levels of anxiety is reported at 35.9%, with 17.1% reporting a high level of anxiety [80]. A prior study that surveyed 395 hemodialysis patients in Greece using HADS found that 47.8% of patients suffer from anxiety [20]. Similarly, a study conducted in Saudi Arabia using the same instrument found that the prevalence of anxiety was 50% [85].

On a dialysis unit, there are numerous factors that could stimulate anxiety; for instance, cannulation in hemodialysis, dialysis machine alarms, lack of control over treatment, and feeling dependent [99, 100]. Anxiety has a significant negative effect on the quality of life of hemodialysis patients [85, 93, 101]. It is correlated with negative clinical results, for example, increased hospitalization frequency and length of stay and high mortality rates [93]. Sometimes, it can influence the ability to focus and the way to process information. This may cause some disruptive behaviors that contradict healthcare professionals [83].

#### **4.2 Management of anxiety in hemodialysis**

Treatment options for anxiety are similar to those for depression and include both nonpharmacological and pharmacological treatments. The nonpharmacological

interventions include psychotherapy and cognitive behavioral therapy. Furthermore, using relaxation techniques is a useful method to reduce anxiety in hemodialysis patients [80]. Prior research found the effectiveness of Benson relaxation training in reducing the level of anxiety among eighty patients on hemodialysis [102]. A recent systematic review that examined the benefit of Benson relaxation training in managing anxiety on hemodialysis found that Benson relaxation was an effective method of management [103]. A randomized controlled trial that was implemented to examine the effectiveness of acupressure therapy in patients receiving hemodialysis also found a significant reduction in anxiety levels [104]. Apart from these methods, the social support derived from family, clinicians, and the community can improve psychological status and alleviate anxiety [80].

If those methods were unsuccessful, different types of medications could be used. Short-acting benzodiazepines (e.g., lorazepam or alprazolam) are recommended for limited periods at low doses. From this class, Ibrium (chlordiazepoxide) and valium (diazepam) should be avoided in patients undergoing hemodialysis [16]. In a severely anxious patient, antipsychotic medications (e.g., haloperidol) may be clinically feasible [16]. However, there is still window for future studies to explore the best management options for anxiety in hemodialysis.

## **5. Delirium**

Delirium is a neurocognitive disorder characterized by an acute episode of confusion of memory, awareness, and thinking [65]. It is often a reversible state among patients undergoing maintenance hemodialysis. It could occur owing to a medical condition, uremia, intoxication, or drug adverse effect. Moreover, studies suggest that this disorder is more prevalent among elderly patients [65, 105]. A recent study found that delirium is independently associated with early mortality in the elderly after starting hemodialysis [106]. The acute delirium could lead to self-harm and death [107].

A rare kind of delirium in hemodialysis is dialysis disequilibrium syndrome, which is a serious form of complication. Headache, visual disturbance, nausea, and agitation are common symptoms of the syndrome, and in more serious cases, delirium, lethargy, seizures, or even coma may also occur [65]. It was noted during or following the initial round of dialysis. Additionally, long-term hemodialysis has increased reports of dialysis disequilibrium syndrome [65].

### **5.1 Screening and diagnostic measures**

Nurses and physicians should be on the lookout for any signs of delirium and screen their patients for any changes in cognition or behavior. Any concerns or suspicions of delirium should be investigated further using a validated tool. The Confusion Assessment Method (CAM) is one of the most valuable tools for detecting delirium. It is designed to help medical professionals without backgrounds in psychiatry or mental health and recognize patients with delirium quickly in high-risk situations [108]. The assessment includes questions that aim to assess delirium through four criteria: (1) acute onset and fluctuating course; (2) intention; (3) disorganized thinking; and (4) altered level of consciousness. The CAM algorithm for the diagnosis of delirium requires having criteria 1 and 2 and either 3 or 4 [108]. Other available tools to assess

delirium include the Mini-Mental State Examination. As nurses provide frequent direct care for patients on hemodialysis, assessment of delirium using a validated tool should be integrated into renal nursing care for early detection of delirium.

## 5.2 Management of delirium in hemodialysis

Starting hemodialysis slowly and gently, using a high dialysate sodium concentration and adding osmotic agents (sodium, mannitol, and glucose) to the blood stream are all ways to avoid delirium in hemodialysis [109]. Other preventive measures include active communication with the patient, avoiding medication interactions, maintaining hydration, and managing the pain [65].

Management of underlying factors is a key for management of delirium [65]. Supportive management provided as appropriate to prevent aspiration and pressure sores. When delirium endangers patient safety or interferes with crucial treatments, pharmacologic treatment is necessary [65]. Antipsychotic medications, such as haloperidol, are drug of choice in the beginning. Benzodiazepines and some antidepressants have also been used for treatment of delirium. The management of underlying factors is critical in the treatment of delirium [65]. Supportive management is provided as appropriate to prevent aspiration and pressure sores. When delirium endangers patients' safety or interferes with crucial treatments, pharmacologic treatment is necessary [65]. In the beginning, haloperidol from antipsychotic medication is considered a drug of choice. Treatment for delirium has also included the use of benzodiazepines and various antidepressants drugs. Dialysis should be stopped in cases of seizure until vital signs stabilize [109].

## 6. Withdrawal from dialysis

It is known that the leading cause of death in dialysis is associated with cardiovascular disease and infection. Psychosocial factors are also concerning factors that contribute to death in dialysis patients. Withdrawal from dialysis results in death due to the clinical manifestations of uremia caused by treatment discontinuation. In dialysis patients, withdrawal is categorized as the third-most frequent reason for mortality [110]. In Western countries, the incidence of withdrawal from dialysis prior to death ranges from 20–30% [8, 111–113]. In North America, the incidence of withdrawal from dialysis accounts for 30% of deaths before death [114]. The decision to discontinue dialysis is associated with several factors, such as older age, female gender, white race, and clinical complications [115–118]. A retrospective cohort study of 133,162 hemodialysis incidents found that 10% of patients who withdrew from dialysis were 80 years of age or older [117]. The psychosocial risk factors that could be associated with increased odds of withdrawal from dialysis are depression, low socioeconomic status, and dementia [39, 110, 117, 119]. Furthermore, the most common reasons for considering dialysis withdrawal in many cases are a lack of enjoyment in life, a sense of being a burden on others, a shift in roles, a loss of control, and lack of social support [114]. Also, studies suggest that high symptom burden, such as pain, is associated with withdrawal from dialysis [114, 120]. There are several obstacles in the process of withdrawal from dialysis that relate to patient and family preferences, cultural and religious views, ethical and legal issues, and priorities in policymaking [114].

## **6.1 Prevention of withdrawal from dialysis**

Indeed, it is important to early recognize those who are at high risk for withdrawal from dialysis to provide them with other solutions, eliminate the potential barriers, and facilitate taking an informed decision. Nurses and physicians are well positioned to provide early intervention for underlying factors, to educate patients about their care, and to provide a comprehensive approach to care. Regardless of the patient's decision, it is unethical to leave patients after their withdrawal from dialysis to suffer from pain and other complications. Since the beginning of their treatment, patients on dialysis and their families should be informed about the possibility of withdrawal from dialysis and the consequences of this option [121]. Therefore, clinicians can offer a good palliative and end-of-life care by alleviating the symptoms and pain management.

## **7. Conclusion**

There are various psychosocial issues that are associated with hemodialysis therapy. There are various psychosocial issues that are associated with hemodialysis therapy. These issues may arise at any stage of the trajectory of hemodialysis. Some issues occur during the initial transition period of hemodialysis; others occur after a long time of receiving hemodialysis or after changing the modality of treatment. Examples of these issues are depression, anxiety, delirium, and withdrawal from dialysis. Due to the complexity of hemodialysis and its accompanying symptoms, identifying these issues remains difficult. This chapter has summarized the most common psychosocial issues among patients undergoing hemodialysis. The early recognition of the high-risk group developing some of these issues in hemodialysis is important for early management, which is cost-effective. Using short screening methods is applicable in clinical practice. Furthermore, for safety concerns, it is recommended to initiate management with nonpharmacological interventions. If the issues are still persistent or there is no improvement, pharmacology-based intervention might be the solution, but with caution.

### **Conflict of interest**

The authors declare no conflict of interest.

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