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The relationship between reactive depression and kidney failure patients

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Abstract

Several psychological problems may manifest among other pathology-comorbidity conditions. The prevalence of this has depression among patients with kidney failure, hampering their motivating desires, therefore affecting treatment adherence. The study focused on psychological behavior and other attributes affecting depression within this population. Using the power of statistical analysis of quantifiably measured factors of depression, it was determined, among major findings, that sadness, hopelessness, failure, self-contempt, insomnia, fatigue, and loss of weight were quintessential factors. Stress, guilt, and neglect of physical health did not show any significance, however, it explores the factors that individual and contextual mannerism came into play. This established the need for integrating mental health support into nephrology care to pursue emotional and physical challenges among patients suffering from renal failure. Recommendations included psychological interventions, educating the providers and caregivers, and further research in the area of interaction relating mental health with chronic illness management. The present study hence laid down a holistic, coordinated patient flow for improvement in both care and wellness of this vulnerable population.

Keywords: Kidney failure, depression, psychological factors, mental health, quality of life, emotional well-being

Introduction

End-stage renal disease (ESRD) or kidney failure is the chronic state of irreversible loss of kidney function, usually requiring lifelong management with either dialysis or transplantation. It is a life-altering disease that places heavy physical, emotional, and social burdens on patients. Amidst the myriad of challenges that imperil the well-being of patients with kidney failure, psychological distress-especially the demons of depression-comes out as a major challenge. This latter group often displays reactive depression, which is a form of depression precipitated by external stressors, including chronic illness (Hashmi *et al.*, 2024) ^[11].

The prevalence of reactive depression among patients with kidney failure is strikingly high but is generally underestimated in clinical practice. Such a disorder may further deteriorate patients' physical health problems, decrease treatment adherence, and diminish overall quality of life. Moreover, the reciprocal relationships between mental health and chronic diseases emphasize the need to treat depression in patients with kidney failure to achieve better clinical outcomes (Wang *et al.*, 2019) ^[9].

Despite this problem becoming more recognized, research into the complex interaction between reactive depression and kidney failure remains scant. Knowledge of this nature is necessary in developing holistic care approaches that will not only address the physical but also the psychological needs of patients. This study attempts to fill the gap by establishing the prevalence, severity, and possible contributory factors of reactive depression among patients with kidney failure (Marin *et al.*, 2023) ^[13].

These findings may bring about an improvement in patient care, with special emphasis on the integration of mental health in nephrology settings. Finally, they will inform health professionals, policymakers, and carers about effective interventions to reduce the psychosocial impact of kidney failure, which will help to enhance the quality of life of these patients and also better treatment outcomes (Kalariya *et al.*, 2023) ^[14].

Reactive depression, also known as situational or adjustment disorder with depressed mood, is one type of psychological condition caused by external stressors or major life events. Unlike clinical depression, which may not have any visible causes, reactive depression could be traced back directly to such situations as chronic illness, loss, or major life changes. It is characterized by sustained feelings of sadness, hopelessness, and emotional numbness, usually accompanied by irritability, fatigue, difficulty concentrating, and sleep disturbances (MSW, (2019) ^[15]).

Although reactive depression is usually less severe than major depressive disorder, it will still impair the ability of the person to cope with everyday life and deal with stress. The symptoms usually develop within weeks of the precipitating event and can last for months if untreated. This, of course, makes reactive depression even more common among those with diseases like renal failure, since the emotional impact of adjustment to a lifelong health condition, frequent medical interventions, and uncertainty about the future all occur together (Remes *et al.*, 2021) ^[16].

Kidney failure, also known as end-stage renal disease (ESRD), is a condition in which kidneys stop functioning properly to excrete waste products and balance fluid and essential electrolyte maintenance. It is a life-threatening disorder requiring renal replacement therapy—dialysis or kidney transplantation—for the survival of the patient. The major causes of kidney failure include diabetes mellitus, hypertension, chronic kidney disease, and glomerulonephritis. Most of the patients present with the symptoms of fatigue, swelling, dyspnea, nausea, and cognitive impairments, evidence of the systemic effects of the diseases. Although life-sustaining, current treatments, such as dialysis and transplantation, place an enormous physical, psychological, and financial burden on the patients (Murdeshwar, *et al.*, 2023) ^[17].

The onset of renal failure is usually a marked turning point in the life course of the patient and thus renders him/her especially vulnerable to reactive depression. Added to the physical afflictions of fatigue and discomfort are the emotional stresses of coming to terms with a chronic and potentially life-shortening illness. But these lifestyle changes, such as strict dietary restrictions and fluid intake limitations, and being dependent on life-supporting medical devices, more often than not lead to feelings of loss and frustration. Social isolation and uncertainty about the future only exacerbate such emotional challenges (Abdel-Kader *et al.*, 2009) ^[8].

The relationship between reactive depression and renal failure is complex, contributing to holistic care. Addressing the psychological implications of renal failure may enhance treatment adherence, better the patients' quality of life, and affect the course of their physical health outcomes. This again underlines the importance of including mental health into the practice of Nephrology with a view to ensuring that all patients with kidney failure and concomitant depression get comprehensive treatment for both diseases (Kalantar-Zadeh *et al.*, 2022) ^[10].

The present research attempts to look into the relationship of reactive depression with kidney failure from psychological and physiological dimensions of the disorder. The objectives are:

- To determine the prevalence of reactive depression in patients with renal failure.

- To study the etiological factors of reactive depression in patients with renal failure.
- To assess the impact of reactive depression on treatment adherence and health outcomes in patients with renal failure.
- To determine interventions for reducing reactive depression in patients with kidney failure through integrated care models.

2. Literature Review

Reactive depression, once differentiated from endogenous depression, still remains a clinically observed phenomenon, which does not easily fit into the DSM-V diagnostic classifications (Showraki, 2019) ^[1]. It usually is caused by identifiable life events and evokes sympathy in other people (MacCalman, 1947) ^[2]. Among the specific features of reactive depression mentioned here are stormy life histories, distinct symptoms, disorders of the personality, precipitating life events, and even family alcoholism (Winokur, 1985) ^[3]. Whereas some studies do provide support for the independence of endogenous and reactive factors in depression, it has been suggested that these do not represent etiologically distinct types. The reactive factor may rather represent a broader psychiatric disorder in which depression constitutes just one of a variety of symptoms (Mendels & Cochrane, 1968) ^[4]. From an epigenetic perspective, the distinction between reactive and endogenous depression becomes blurred as environmental stressors interplay with genetic predispositions in all forms of depression (Showraki, 2019) ^[1].

Kidney failure is one of the major health problems in the world and contains many psychological components. Most patients with end-stage renal disease develop mental disorders, including depression and anxiety; the prevalence rates vary between 10% and 29% (Gerogianni & Babatsikou, 2014) ^[5]. Factors associated with increased psychological distress include female gender, low education, advanced age, comorbidity, and poor family functioning (Pappas *et al.*, 2021) ^[7]. Chronic kidney disease has a negative impact on health-related quality of life, mainly concerning mental health (Butt *et al.*, 2022) ^[6]. Patients with dialysis have a negative association with working life, social life, and diet limitations (Stavroula, 2014). On the other hand, well-being constructs, such as positive affect, optimism, and resilience, may have protective mental and physical health benefits in patients with kidney failure, including higher quality of life and longer survival (Zambrano *et al.*, 2022) ^[18]. Interventions targeting self-efficacy and other positive psychological constructs are promising for improving health outcomes and adherence among this population (Zambrano *et al.*, 2022) ^[18].

Chronic diseases have great psychosocial effects on the mental health and well-being of patients. Although such conditions may be emotionally or physically disabling (Dubey, 2021) ^[19], a major finding is that psychological adjustment to a chronically ill condition is very good and largely unrelated to diagnosis (Cassileth *et al.*, 1984) ^[20]. It is well known that social support systems, coping strategies, and health beliefs influence disease course and adherence to treatment (Jiakponna *et al.*, 2024) ^[22]. Age, time since diagnosis, and physical status have been related to mental health outcomes in chronic illness (Cassileth *et al.*, 1984)

[20]. A combined psychosocial and medical treatment approach may benefit patient well-being and possibly improve long-term health outcomes by promoting resilience in living with chronic conditions (Jiakponna *et al.*, 2024) [22]. A bidirectional relationship between physical and mental health has been well supported in the literature across various populations. Poor mental health, especially major depression and anxiety, is associated with poor physical health outcomes, including increased risk of cardiovascular disease and compromised immune function (Gandhi, 2024) [23]. Longitudinal studies have shown that prior physical health is a leading indicator of subsequent changes in mental health, and vice versa; however, the influence of physical health on mental health is stronger (Luo *et al.*, 2019; Jansen *et al.*, 2022) [24, 25]. In older adults, a history of depression independently predicts faster deterioration of physical health and increased chronic medical burden, independent of current mental health status (Cho *et al.*, 2010) [26]. In a study among university students, poor general physical health increased mental health symptoms more than the other way around-mental health problems causing deterioration of physical health (Jansen *et al.*, 2022) [25]. Such results delineate the importance of incorporation in early interventions and healthcare practices that give prominence to holistic health outcomes. Depression is highly prevalent in patients with renal failure, especially in 20–25% of ESRD patients (Kimmel *et al.*, 2007) [27] and in 35–41.7% of those on conservative treatment or hemodialysis (Andrade *et al.*, 2010) [28]. Depressive disorders in patients with kidney failure are linked to higher mortality rates, probably because of poor adherence to treatment and issues with nutrition (Kimmel *et al.*, 2007) [27]. Risk factors include female sex, low income, poor functional capacity (Andrade *et al.*, 2010) [28], low BMI, and comorbid physical illnesses (Chen *et al.*, 2010) [29]. Screening tools for depression, such as the Beck Depression Inventory- BDI have been appraised for use in kidney failure patients (Kondo *et al.*, 2020) [30]. Importantly, depression and anxiety are strong indicators of suicidal ideation in hemodialysis patients, with 21.5% reporting suicidal thoughts in the past month (Chen *et al.*, 2010) [29]. Early detection and treatment of depression in patients with kidney failure is critical; however, further study is needed regarding optimal treatment methods (Kimmel *et al.*, 2007) [27].

Theoretical framework and rationale for the study

This study is based on the biopsychosocial model (figure 1), which gives paramount importance to the interaction of biological, psychological, and social factors in determining health and illness. Thus, according to this model, chronic illnesses like kidney failure are not only accompanied by physical complications but also have deep psychological and social consequences. Within this framework, one critical outcome is reactive depression, a psychological response to stressors such as the diagnosis and management

of a chronic illness. The biopsychosocial model provides a wide-angle lens through which the interplay of physical illness, emotional stress, and social circumstances in the development and course of reactive depression in patients with kidney failure can be observed.

The study is also informed by the stress-coping theory by Lazarus and Folkman. The theory holds that individuals experience stress when the demands of a situation are perceived to be greater than the coping resources. Kidney failure is a major stressor that patients must cope with in terms of lifestyle changes, medical regimens, and the psychological burden of living with a chronic condition. This vulnerability to withstand the stressors can lead to reactive depression. The study employs this theory in tracing how coping mechanisms and support systems of patients influence psychological well-being.

The rationale for this study is based on the fact that mental health is a very important aspect of comprehensive health care. Among patients with kidney failure, reactive depression is common but underdiagnosed and is generally overshadowed by the dominant concern of controlling the physical aspect of the disease. What is evidently lacking in studies that will address the psychological needs of such patients, an area this study hopes to fill. By identifying the prevalence, contributing factors, and consequences of reactive depression in this population, the study sets out to make an important point about incorporating mental health into the structure of care provided by nephrologists.

Moreover, addressing reactive depression will be important to the improvement of treatment adherence since depression is often accompanied by non-compliance with medical regimens that worsen health outcomes. The findings from this study will help in developing holistic models of care where both the physical and psychological well-being of kidney failure patients are considered paramount, thus serving as a useful guide for healthcare providers, policymakers, and caregivers.

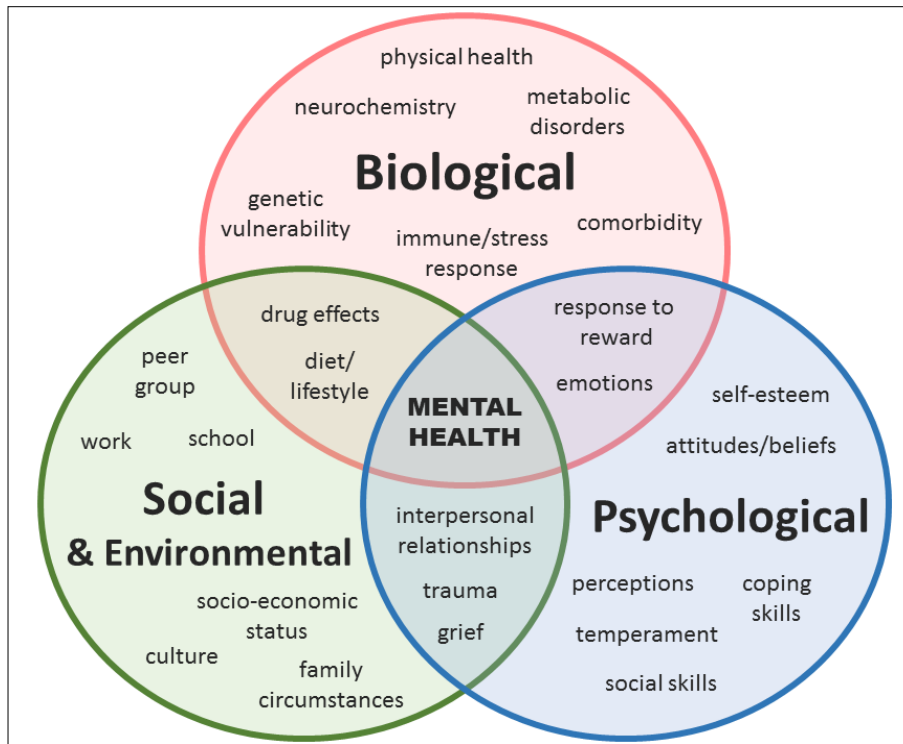
3. Methodology

Research Design

The present study is based on a quantitative research design to study the relation of reactive depression with kidney failure. Since the sample size is limited to only 9 participants in the current study, an application of a standardized scale permits systematic data collection that is required to investigate specific dimensions of psychology and social aspects that relate to reactive depression.

Sampling

In this study, participants are purposively sampled to obtain 9 participants meeting the inclusion criteria of the study that include those diagnosed with renal failure and currently undergoing treatment, which may include dialysis and transplantation. This would ensure that the respondents selected can help in achieving the objectives established in the study.



(Source: <https://www.open.edu/openlearn/science-maths-technology/exploring-the-relationship-between-anxiety-and-depression/content-section-2>)

Fig 1: The bio-psycho-socio-environmental model for mental health

Data collection

Data are collected through a validated self-report scale by the Beck Depression Inventory, for which the sampling was done in view of measuring symptoms of reactive depression. This scales measure a constellation of emotional, cognitive, and somatic symptoms that would give a more detailed assessment of the participants' psychological states. The orientation of participants is done by fully explaining the purpose of the study and the necessary instruction on how to complete the scale. This is done in order to ensure that the participants understand the procedure, so the purpose of eliciting accurate and meaningful responses is well served. The scale is then administered individually according to the participants' preference and accessibility to facilitate the process and minimize potential barriers to participation. In addition, participants give the necessary demographic information of age, gender, renal failure diagnosis. Indeed, such data will complement this type of analysis by giving it some background to the results psychologically.

Statistical analysis

Data analysis uses quantitative approaches with both descriptive and inferential statistics to be utilized to gain useful information. Descriptive analysis summarizes data with the help of measures such as mean, standard deviation, and frequency distribution. This gives a clear outline regarding the prevalence and severity of reactive depression in the sample. On the other hand, inferential analysis goes further in looking at possible relationships between depression scores and demographic or clinical variables to ascertain underlying patterns and relationships. Comparisons can provide an overview of preliminary trends by demographic or clinical factors, although the generalisability of findings may be compromised by the small sample size. This analytic approach can help to ensure that this study produces results that are meaningful and

actionable, providing insight into the psychological burden faced by patients suffering from kidney failure.

Ethical Considerations

The participants are informed about the purpose of the study to be undertaken, the procedure to be followed in that regard, and the confidentiality with which their data are processed. Written consent before participation was sorted. Participants were given the right to withdraw at any stage without any obligation. The use of a standardized scale minimizes potential distress since the questions are not intrusive or too detailed.

This methodology involves the use of a previously validated scale that ensures the reliable measurement of reactive depression within the constraints of a small sample size. Subsequently, the findings can be utilized to garner valuable insights from patients on the psychological sequelae of renal failure and inform strategies for appropriately targeted mental health interventions.

Results

Demographics of the study sample

In all, there are nine participants—a modest cohort size that is enough for an in-depth, focused study to ensure experiences of each individual are well explored. The population is near to being equally distributed as regards the sexes; hence, it is balanced enough to reflect what might be the relationship between reactive depression and kidney failure across genders. Of the participants, five are female, representing 55.6% of the sample, while four are male, accounting for 44.4%.

The age structure of the respondents is very wide, which indicates the different groups of ages that are at risk of kidney failure and its resulting psychological repercussions. There are respondents aged between 28 and 86 years, hence it is a disease affecting all the ages of adults. Each age represented in the data corresponds to one single participant

hence it is evenly distributed with each age representing 11.1% of the total sample.

The youngest was 28 years, and the oldest was 86, meaning that the ravages of renal failure are not limited to either the younger or the older group. Those in their 50s and 60s constitute a fairly sizable chunk of the sample, with specific ages of 56, 57, 58, 60, and 61. This sort of clustering might suggest that middle-aged and early elderly persons could be a significant demographic for studying the interplay between chronic illness and psychological distress, although these trends would require investigation with larger samples to point out any tendencies.

The mean participant age is 53.7 years, indicating the sample reflects a middle and late adulthood perspective.

Prevalence of reactive depression among kidney failure patients

Kidney failure

All the participants, therefore, have been diagnosed with kidney failure (100%). This homogeneity of kidney failure diagnosis ensures that the study focuses on a population that is directly experiencing the psychosocial challenges in association with this chronic disease. The diagnosis of kidney failure encompasses the objectives of the study, as it allows exploration into how this particular condition may contribute to or exacerbate symptoms of reactive depression.

Depression levels: Approximately almost half of the sample (44.4%) does not suffer from depressive symptoms. This stipulates that a large proportion of the sample remains psychologically stable despite the disease. While (33.3%) fall into the group "Mild Depression," which may indicate that a whole lot of people have low-level depressive symptoms. The group represents those who might take advantage of early interventions in the prevention of the development of depression. The categories "Moderate Depression" and "Severe Depression" each have one participant to make up 11.1% of the sample in each category. These results point out that severe depressive symptoms are less common in this sample, though they do exist and require specific mental health interventions.

Sadness: Data represents the mood state of sadness for nine participants, divided into three stages: The majority of participants, seven out of nine, constitute 77.8% and reported the lowest level of sadness, labeled as "1." This may be an indication that most in the sample experienced very little or no substantive emotional distress related to sadness, describing a rather stable emotional condition for the majority of them. Only one respondent (11.1%) reported a score of "2," which represents moderate sadness. Only one respondent (11.1%) also recorded the highest measure of sadness, which is indicated by a score of "3." These two respondents point out that within this subset of the population, there is a divergence of emotional experience; a portion of this group reports more intense feelings of sadness.

Pessimism: The largest number of participants-six out of nine (66.7%)-had a score of "2," representing moderate levels of pessimism. That means a large part of the sample shows some kind of negative perspective or uncertainty but in a non-extreme way. Two participants (22.2%) reported the lowest level of pessimism, represented by a score of "1." This group represents those with a relatively optimistic perspective or a minimal negative outlook and flags a small subset of the sample that remains positive despite potential everyday challenges. On the other hand, only one participant

(11.1%) reported a high level of pessimism, indicated by a score of "3." This participant represents the most affected in terms of negative expectations or feelings of hopelessness and points to the need for targeted psychological support.

Feeling failure

A large majority of participants, eight out of nine (88.9%), reported the lowest level of failure, represented by a score of "1." This could indicate that most individuals in the sample experience little to no great feelings of failure, which may further imply relatively positive self-esteem or resilience in the face of possible life difficulties. In contrast, only one participant (11.1%) reported a score of "2," indicating a moderate level of feeling like a failure. The individual represents a small subgroup of the sample who may be battling self-doubt or negative self-evaluation and thus should be explored further in order to enable the application of tailored psychological support.

Enjoyment in life

The results depict the levels of enjoyment in life among participants, which are spread over three categories. A large majority of the participants (77.8%), reported the lowest level depicted by a score of "1." It could thus be inferred that for most individuals in the sample, minimal disruption of the ability to enjoy life occurs, depicting generally positive or neutral emotional states. On the other hand, 11.1%, had a score of "2," indicating a moderate reduction in the ability to enjoy life. At the same time, another participant, which makes up 11.1%, rated the highest level represented by a score of "3," which means the complete absence of pleasure derived from living. These are symbolic of the minority in the sample who may be going through emotional distress and have an impaired quality of life.

Feeling of guilt: Feelings of guilt among participants were spread across two levels: the highest percentage of participants, eight out of nine (88.9%), reported the lowest level of guilt, represented by the score "1." This might be an indication that most individuals in the sample experience little or no considerable feelings of guilt, hinting at generally positive or neutral emotional states regarding self-blame or regret. In contrast, only one participant (11.1%) reported a score of "2," indicating a moderate level of guilt. This participant represents a small subset of the sample who may be experiencing some emotional struggle related to feelings of responsibility or remorse.

Feelings of punishment

Respondents' feelings of punishment are distributed across three levels. The majority of the respondents, seven out of the nine, at 77.8%, reported the lowest feeling of punishment, represented by a score of "1." This may indicate that most of the sample population does not perceive themselves as being in a state of punishment, which generally reflects a positive or neutral emotional state on this aspect. One respondent (11.1%) answered with a score of "2," which represents moderate punishment perception. Still, another respondent (11.1%) has given the highest possible level, portrayed by a "3" score, indicating a strong feeling of being punished. Both these individuals represent a smaller portion of this sample that may be exposed to more emotional burden or distress.

Dissatisfaction

Levels of dissatisfaction with self were divided into two clear levels. A large majority of participants, eight out of

nine (88.9%), recorded the lowest level of dissatisfaction with self, indicated by a "1" score. Thus, most members within the sample report feeling little to no dissatisfaction with themselves at all—generally indicating positive or neutral self-perceptions. On the other hand, only one participant (11.1%) has scored "2," indicating moderate levels of self-dissatisfaction. The person represents a small portion of the sample who may be having some problems with either self-esteem or general personal satisfaction.

Self-criticism

Thus, the tendency of participants toward self-criticism was spread over three levels. A majority of the participants, seven out of nine (77.8%), revealed the lowest degree of self-criticism, depicted by a score of "1." This actually means that the greatest part of this subsample has low tendencies to criticize themselves—a basically positive or neutral attitude toward self-evaluation. Only one participant (11.1%) reported a score of "2," which designates a moderate level of self-criticism. In addition, one respondent (11.1%) marked the highest level, as evidenced by a score of "4," indicating a strong tendency to engage in self-critical thoughts or behaviors. These individuals make up a minority of the sample who may experience greater emotional difficulty in regard to judgment of the self.

Desperation at life

This measures the distress participants reported feeling about life, collapsed into one level. All nine participants (100%) reported the lowest level of distress: a score of "1." This suggests that none of the sample participants reported sense of discomfort or distress about life.

Crying: A number of tendencies towards crying among participants were distributed along two levels. A majority of the participants, six out of nine (66.7%), have reported on the lowest level represented by a score of "1." Thus, it can be determined that most individuals within the sample hardly ever or never cry, therefore showing a rather stable emotional state. On the other hand, three participants (33.3%) registered a score of "2," which specifies a moderate tendency to cry.

Stress

Experiences of tension among the participants were spread across four levels. Most participants, six out of nine (66.7%), reported the lowest level of tension, which is accorded by a score of "1." This may suggest that most people in this sample generally experience little stress or anxiety, reflecting a condition of being relatively calm and emotionally stable. On the other hand, one participant (11.1%) reported having a score of "2," which denotes a moderate level of tension. One participant (11.1%) also reported a "3," indicating a higher level of tension, and one participant (11.1%) reported the maximum level of tension, scored as a "4," indicating a high level of emotional strain or stress.

Interest in others

The disinterest was reported to the lowest degree by all participants (100%), with a score of "1." This may mean that no participant in the sample presented major signs of losing interest in others, thus manifesting a strong sense of engagement and social connection.

Decision-Making

The majority of participants (66.7%) reported the lowest level of difficulty, as represented by a score of "1," indicating minimal problems in decision-making. One participant each (11.1%) reported scores of "2," "3," and "4," reflecting moderate to severe difficulties in making decisions. While most preserve good decision-making abilities, a minority experience quite hefty challenges.

Feeling bad

Scores pertaining to how bad participants felt were spread over four levels. Four participants (44.4%) reported the lowest level of feeling bad, which is score "1." Besides, one participant (11.1%) reported a score of "2." Two participants each (22.2%) reported scores of "3" and "4," indicating moderate and severe feelings of distress. The results hint at possible differences in emotional states in that there may be those who experienced extreme negativity.

Inability to Work: Looking at the Capability to Work index, four subjects (44.4%) reported the lowest perceived level of incapacity—score "1." Three subjects (33.3%) reported moderate levels of incapacity—score "2," and finally, one subject each (11.1%) reports "3" and "4" scores, indicating high levels of inability to work. Such scores suggest that while some participants retain work functioning, others are seriously impaired.

Inability to Sleep: Sleep problems were scored at three levels. Five participants (55.6%) scored minimal or no problems of sleep (score "1"), while two participants each (22.2%) reported moderate (score "2") and severe problems (score "3"). These results illustrate, on the one hand, that most participants sleep well, yet, on the other hand, a minority experiences major sleep disturbance.

Feeling Exhausted

Feelings of fatigue varied over four levels: four participants (44.4%) reported low-fatigue scores ("1"), while two (22.2%) were moderate, with a score of "2". One participant (11.1%) scored "3", and two (22.2%) experienced severe fatigue, scoring "4". Hence, although fatigue was a common experience, some did report high levels.

Loss of Appetite: Appetite was lost to two degrees. Four respondents (44.4%) reported a minimal or no loss of appetite (score "1"), and five respondents (55.6%) reported a moderate loss of appetite (score "2"). The above findings thus suggest that loss of appetite is quite a common problem among the respondents though not to a great extent.

Weight Loss

Weight loss varied between the four levels. Four participants (44.4%) reported no weight loss (score "1"), while two participants each (22.2%) reported moderate (score "2") and severe weight loss (score "4"). One participant (11.1%) scored "3." These findings support that, although weight stability is common, participants also report a substantial amount of weight loss problems.

Neglect of Physical Health

Distribution of neglect of physical health was on the four levels of scores. Three participants (33.3%) reported no neglect, which demonstrates a "1" score, while four (44.4%)

reported moderate neglect reflected by a "2" score. One participant each (11.1%) reported a "3" and a "4" score, reflecting severe neglect of physical health. The results underline that physical health neglect is a problem for a minority of participants.

Lack of Interest in Sexuality

Participants reported varying levels of lack of interest in sexuality. Four participants (44.4%) reported minimal problems, at a score "1", whereas one participant (11.1%) reported moderate disinterest at a score "2". Two participants each (22.2%) indicated the presence of significant (at score "3") and severe (at score "4") disinterest. These scores suggest that for some part of the sample, sexual disinterest is a problem.

Relationship between kidney failure and levels of depression

Descriptive statistics

Descriptive statistics is provided in table 1 to show the association of depression pattern with kidney failure.

Most participants in this study belong to the middle-aged to older brackets, with a mean age of 53.56 years. The sex variable shows little variation, suggesting a small gender disparity, which might threaten generalizability if specific gender-related factors are involved in depression or in coping strategies.

Depression and Psychosocial Factors show a moderate mean (mean = 1.89) with a range of answers, reflecting various levels of psychological impact upon the sample population. This finding is in line with current literature, which shows that patients with renal failure commonly experience emotional and psychological challenges due to the chronic condition.

Low means noted for variables such as sadness (mean = 1.33), self-criticism (mean = 1.44), and dissatisfaction (mean = 1.11) indicate that the level of psychosocial distress is comparatively low within the group. However, the higher standard deviation noted in factors like stress (mean = 1.67, SD = 1.12) and negative feelings (mean = 2.22, SD = 1.30)

denotes that some experience emotional challenges to a great degree.

Pessimism (mean = 1.89) and a lack of interest in sexuality (mean = 2.22) also emerge as areas of concern, indicating reduced emotional well-being and personal fulfillment. Such findings suggest the need for targeted psychological support to address specific concerns like hopelessness and reduced quality of life.

Effects on behavioral and physical health associated with kidney failure was 1 (meaning that every participant had this disorder) is evidence of its importance as a major factor in determining outcomes for the study variables concerning psychological and physical health.

Factors such as Inability to Sleep (mean = 1.67) and weight loss (mean = 2.11) hint at the physiological impact of renal failure, with apparent variability suggesting that the extent of impact is not uniform for all patients. The mean score concerning neglect of physical health (mean = 2) hints at the fact that some participants have some trouble maintaining self-care, which can be related to fatigue, stress, or depressive symptoms.

Clinical implications associated with factors such as negative emotions, stress, and lost interest in sexual activity underlines the need for holistic care strategies that account for both psychosocial and physical health. Programs offering psychological support, together with medical interventions, could help soften the mental health impact of renal failure. Interpersonal and societal influences such as concern for others and feelings of hopelessness about life suggest that some interpersonal or existential aspects may be relatively unscathed. However, such a finding also could reflect limitations in the sensitivity of measurement or individual variations in coping mechanisms. Variability in Responses The considerable variation observed in specific elements, such as stress levels and negative emotions, suggests that the experiences of patients dealing with kidney failure and depression are heterogeneous. These disparities may be shaped by such demographic factors as age or gender, beside personal resilience, the availability of social support, and access to healthcare resources.

Table 1: Descriptive analysis of the measurement factors

Measurement Factors	Mean	Median	Standard Deviation	Variance	Minimum	Maximum
Sex	1.444444	1	0.527046277	0.277777778	1	2
Age	53.55556	57	17.62889043	310.7777778	28	86
Depression	1.888889	2	1.054092553	1.111111111	1	4
Kidney Failure	1	1	0	0	1	1
Sadness	1.333333	1	0.707106781	0.5	1	3
Pessimism	1.888889	2	0.600925213	0.361111111	1	3
Feeling failure	1.111111	1	0.333333333	0.111111111	1	2
Enjoyment in life	1.333333	1	0.707106781	0.5	1	3
Feeling of guilt	1.111111	1	0.333333333	0.111111111	1	2
Feelings of punishment	1.333333	1	0.707106781	0.5	1	3
Dissatisfaction	1.111111	1	0.333333333	0.111111111	1	2
Self-criticism	1.444444	1	1.013793755	1.027777778	1	4
Desperation at life	1	1	0	0	1	1
Crying	1.333333	1	0.5	0.25	1	2
Stress	1.666667	1	1.118033989	1.25	1	4
Interest in others	1	1	0	0	1	1
Decision-Making	1.666667	1	1.118033989	1.25	1	4
Feeling bad	2.222222	2	1.301708279	1.694444444	1	4
Inability to Work	1.888889	2	1.054092553	1.111111111	1	4
Inability to Sleep	1.666667	1	0.866025404	0.75	1	3
Feeling Exhausted	2.111111	2	1.269295518	1.611111111	1	4
Loss of Appetite	1.555556	2	0.527046277	0.277777778	1	2
Weight Loss	2.111111	2	1.269295518	1.611111111	1	4
Neglect of Physical Health	2	2	1	1	1	4
Lack of Interest in Sexuality	2.222222	2	1.301708279	1.694444444	1	4

Correlation statistics

Table 2 shows the T-statistics and p-values for the various measured factors of depression, showing the statistical significance of each factor in relation to depression among respondents. From these results, a combination of both significant and non-significant associations between the factors and depression indicates a look into the psychological and emotional constituent elements of depressive symptoms in this group.

Among the important factors, sadness appears with a large T-statistic of 5.29 and a low p-value of 0.001, so it has a strong relation to depression. This agrees well with general clinical observations: in the course of depression, sadness is one of the key symptoms. Second, pessimism results in a $T = 3.16$ and $p = 0.015$, while feeling of failure brings about a $T = 3.01$ and $p = 0.019$, thus showing that hopelessness and perceived inadequacy are significant variables that contribute to depressive states. Another critical factor is the enjoyment in life: $T = 5.29$, $p = 0.001$. It shows how sometimes the incapacity of enjoying life may be a crucial marker for depression, bringing in support to the idea that the main symptom of the disorder is reduced pleasure and fulfillment.

The self-criticism, at $T = 3.03$ and $p = 0.028$, shows that the depressed individual may criticize himself, while crying, $T = 3.41$ and $p = 0.011$, indicates frequent emotional expression through tears as one of the major symptoms of depression. Inability to sleep also significantly resulted, as did feeling exhausted, at $T = 3.25$, $p = 0.013$ and $T = 4.29$, $p = 0.003$, respectively, indicating severe disturbance of sleep and chronic tiredness among these depressed individuals. Weight loss is another significant factor at $T = 4.29$, $p = 0.003$, reflecting that physical symptoms often accompany depressive states.

On the other hand, several factors do not show statistically significant associations with depression. The high p-values of guilt feelings ($T = 1.13$, $p = 0.29$) and dissatisfaction ($T =$

1.13 , $p = 0.29$) indicate that such feelings might not be central to depression in this sample. In the same way, feelings of punishment ($T = 0.607$, $p = 0.56$) and stress ($T = 0.78$, $p = 0.46$) are not significantly correlated with depression, which may mean that these factors are not in the foreground of participants' depressive experiences. Other factors such as desperation at life ($T = 0.104$, $p = 0.919$) and interest in others ($T = 0.104$, $p = 0.919$) also indicate no significant relation with depression, suggesting that feelings of hopelessness or social withdrawal may not be that strong in this group.

Decision-making and loss of appetite show no significant correlations, with $T = 0.475$, $p = 0.64$ and $T = 0.988$, $p = 0.35$ respectively, further suggesting that these symptoms may be less core in the depressive experiences of this particular sample. Finally, neglect of physical health ($T = 1.94$, $p = 0.09$) and lack of interest in sexuality ($T = 0.812$, $p = 0.44$) approach significance but remain outside the typical threshold, indicating that while these factors may be relevant to some individuals, they do not appear to be key drivers of depression for the participants in this study.

The results emphasize the fact that emotional and physical symptoms regarding sadness, pessimism, and enjoyment in life, as well as physical manifestations like exhaustion and weight loss, are a more salient feature of depression. Factors related to guilt, stress, and loss of appetite did not show strong correlations and might indicate that personal and contextual factors serve as moderators in the experience of depression. This could reflect different coping mechanisms or perhaps a variation in the manifestation of depression in different individuals, particularly in those with chronic conditions like kidney failure. Overall, the data would suggest that both emotional and somatic symptoms should be taken into consideration in the diagnosis and management of depression, as these are important elements that significantly impact the well-being of individuals.

Table 2: Correlation analysis

Measured factors of depression	T statistics	p value
Sadness	5.29	0.001
Pessimism	3.16	0.015
Feeling failure	3.01	0.019
Enjoyment in life	5.29	0.001
Feeling of guilt	1.13	0.29
Feelings of punishment	0.607	0.56
Dissatisfaction	1.13	0.29
Self-criticism	3.03	0.028
Desperation at life	0.104	0.919
Crying	3.41	0.011
Stress	0.78	0.46
Interest in others	0.104	0.919
Decision-Making	0.475	0.64
Feeling bad	2.311	0.054
Inability to Work	0.575	0.58
Inability to Sleep	3.25	0.013
Feeling Exhausted	4.29	0.003
Loss of Appetite	0.988	0.35
Weight Loss	4.29	0.003
Neglect of Physical Health	1.94	0.09
Lack of Interest in Sexuality	0.812	0.44

Discussion

The findings of the study offer a lens through which discussions can be carried out related to the complex

interplay between physical and mental health concerning patients with chronic conditions like kidney failure.

Sadness and pessimism reflect the overwhelming toxic emotional milieu of chronic kidney disease and concur with research indicating that depression is a common comorbidity among patients with kidney failure, engendered by the chronic nature of the disease, social isolation, and lifestyle restrictions (Kimmel *et al.*, 2000; Stavroula *et al.*, 2014) [27, 1]. Sadness, a classic marker of depression, can indicate a reactive response to the demands of the disease (MacCalman, 1947) [2]. Feelings of hopelessness and pessimism further increase the patient's struggle with chronic health conditions. Failures and self-criticisms impact negatively on depressive symptoms, augmenting evidence from studies that have strongly associated low self-esteem and self-blame with adverse mental health outcomes in chronic illnesses (Gerogianni & Babatsikou, 2014) [5]. These factors likely contribute toward diminished coping and resilience in patients facing the never-ending challenges of renal disease. Additionally, patients' inability to enjoy life corroborates findings placing an inverse relationship between kidney diseases and patients' quality of life, which bears great import on their psychological state (Butt *et al.*, 2022) [6]. This is a common feature of depression, which has received the label of anhedonia and is amplified by chronic illness.

Crying sustains the concept of emotional dysregulation, usually seen in depressed states focused on severely stressing factors. Episodes of crying are limbic replies to psychological distress, mainly seen in the under-rugged patients who do not have altitudinal mechanisms of coping (Zambrano *et al.*, 2022) [18]. Sleep disturbances and fatigue are equally irritating in patients with kidney disorders, consistent with studies linking chronic illnesses with difficulties in sleep, fatigue, and poor overall functioning (Chen *et al.*, 2010; Kimmel *et al.*, 2000) [29, 27]. All these factors have a reinforcing cycle by which either factor can contribute to progressive decline in a patient's mental or physical health or both, amplifying depressive symptoms.

The role that non-significant factors, such as feelings of guilt and punishment, play points to the probably minor importance of these feelings in this population compared to others. In the other chronic illness studies, guilt and punishment were generally significant (Showraki, 2019) [1]. The cultural or personal interpretation of these emotions may differ within this sample. Similarly, stress and desperation at life were not significant. Possibly, this is due to mechanisms of accommodation within the patients or to stress being overshadowed by other depressive variables.

Neglect of physical health and lack of interest in sexual activity, though not statistically significant, remain important in the more general context of depressive symptoms, as they still often reflect diminished motivation and energy levels relative to chronic illness (Cassileth *et al.*, 1984) [20]. These findings may carry weight for clinical assessments and interventions.

The findings showcase how psychological and physical symptoms combine in depression in kidney failure patients. Factors of major significance—sadness, feelings of hopelessness, and physical symptoms—are in accordance with the established literature.

It is particularly relevant that depression may itself be an independent predictor of physical health decline, especially in older adults (Cho *et al.*, 2010) [26], emphasizing that prompt detection and management of depressive symptoms may prove of great benefit. Using the Beck Depression

Inventory (BDI) as a depression-screening instrument for patients with kidney failure (Kondo *et al.*, 2020) [30], the identification of at-risk individuals and for timely and effective intervention may be achieved.

Limitations of the study

The study enumerates significant associations, however, it cannot ascertain whether some specific depressive symptoms are causative or consequential to renal failure or its treatment. On the other hand, small sample size restricts the achieved results to the study sample.

Recommendations

Psychosocial rehabilitation of patients with chronic kidney failure has to address the myriad of psychological and behavioral problems that have arisen as a consequence of the disease. Cognitive Behavioral Therapy can be adapted to aid patients' redeployment of deteriorating self-images that emanate from contrary thoughts, regarding themselves, such as a sense of inferiority and self-denigration. Moreover, peer support groups can facilitate a sharing of patients' experiences and coping techniques for feelings of seclusion and despondency. The most useful are mindfulness-based relaxation techniques to help patients deal with stress, crying, and sleep problems. Art and music therapy, among creative therapies, allows patients an emotional release while promoting patients' general quality of life and enjoyment in living.

Incorporating psychological support services in nephrology care is an essential part of holistic treatment. Nephrologists should incorporate routine psychological assessments of patients to help detect early the possible onset of depression and anxiety disorders. The multidisciplinary care team, including mental health professionals, would offer immediate management of depressive symptoms and comorbidities. Psychoeducation programs could enhance the patients' and their families' understandings of the psychological challenges of renal failure and of the importance these challenges should play in motivating a cure-seeking attitude in kidney patients. Telehealth modalities for remote or underserved patients allow access for psychological support, effectively bridging deficiencies in care delivery.

Psychosocial wellbeing of chronic kidney failure patients is fostered by service providers and caregivers. Nephrology staff should undergo training in minimal psychometric recognition of psychological distress for continuity in care. Emphasis should be placed on trust and empathy for the emotional needs of patients. Caregiver supportive programs that incorporate counseling and workshops will mitigate a caregiver's stress and provide effective emotional support to each patient. These include a development of care planning around patient and family psychological well-being for improved patient health outcomes.

Conclusion

This study provides strong evidence of psychological contributors to depression among patients with kidney failure, such as sadness, pessimism, feelings of failure, self-criticism, and physical symptoms like exhaustion and weight loss. These findings highlight the seriousness of the emotional and behavioral barriers faced by the population, while at the same time naming weak contributing factors such as stress and feelings of punishment, thus possibly

indicating idiosyncratic differences or variations along contextual lines. This study has reinforced the crucial role that the interaction between psychological symptoms and physical symptoms has played in influencing patients' mental health outcomes.

In practice, the findings support the introduction of mental health into nephrology practice so as to provide comprehensive care for patients with kidney failure. Having a reliable mental assessment, followed by treatment modalities such as Cognitive Behavioral Therapy (CBT) or mindfulness programs, and running multidisciplinary health care teams will greatly improve wellness in patients. Furthermore, teaching awareness for providers and caregivers to recognize the mental health concerns would definitely help improve the care matrix offered to patients.

To improve care for a population of patients experiencing depression due to kidney failure will entail the application of holistic approaches centered on ensuring emotional resilience alongside physical health. In confronting different dimensions of depression through context-sensitive interventions and systemic changes in patient/delivery approaches, care providers can ensure patients are better adherent to treatments, and improve quality of life, with favorable long-term outcomes. The findings and recommendations of this study speak to the basis of advancing research, improving clinical practice, and advocating for kidney failure patients in their battles with mental health concerns.

8. References

1. Showraki M. Reactive Depression: Lost in Translation! *Journal of Nervous and Mental Disease*. 2019 Sep;207(9):755-759. DOI: 10.1097/NMD.0000000000000989. PMID: 31464986.
2. Maccalman DR. Recognising depression. *Health Education Journal (Los Angeles)*. 1947 Oct;5(4):169-173. DOI: 10.1177/001789694700500407. PMID: 20270258.
3. Winokur G. The validity of neurotic-reactive depression. New data and reappraisal. *Archives of General Psychiatry*. 1985 Nov;42(11):1116-1122. DOI: 10.1001/archpsyc.1985.01790340100014. PMID: 4051688.
4. Mendels J, Cochrane C. The nosology of depression: the endogenous-reactive concept. *American Journal of Psychiatry*. 1968 May;124(11):Suppl:1-11. DOI: 10.1176/ajp.124.11S.1. PMID: 4872231.
5. Gerogianni SK, Babatsikou F. Psychological aspects in chronic renal failure. *Health Science Journal*. 2014;8:205-214.
6. Butt MD, Ong SC, Butt FZ, Sajjad A, Rasool MF, Imran I, *et al*. Assessment of health-related quality of life, medication adherence, and prevalence of depression in kidney failure patients. *International Journal of Environmental Research and Public Health*. 2022 Nov 18;19(22):15266. DOI: 10.3390/ijerph192215266. PMID: 36429988; PMCID: PMC9690334.
7. Pappas G, Mitsi D, Papatheanasiou I, Fradelos E. Psychological distress in end-stage renal disease patients: prevalence and associated factors. A literature review. *International Journal on Biomedicine and Healthcare*. 2021;9:81. DOI: 10.5455/ijbh.2021.9.81-86.
8. Abdel-Kader K, Unruh ML, Weisbord SD. Symptom burden, depression, and quality of life in chronic and end-stage kidney disease. *Clinical Journal of the American Society of Nephrology*. 2009 Jun;4(6):1057-64. DOI: 10.2215/CJN.00430109. Epub 2009 May 7. PMID: 19423570; PMCID: PMC2689883.
9. Wang WL, Liang S, Zhu FL, Liu JQ, Wang SY, Chen XM, *et al*. The prevalence of depression and the association between depression and kidney function and health-related quality of life in elderly patients with chronic kidney disease: a multicenter cross-sectional study. *Clinical Interventions in Aging*. 2019 May 15;14:905-913. DOI: 10.2147/CIA.S203186. PMID: 31190776; PMCID: PMC6526925.
10. Kalantar-Zadeh K, Lockwood MB, Rhee CM, *et al*. Patient-centred approaches for the management of unpleasant symptoms in kidney disease. *Nature Reviews Nephrology*. 2022;18:185-198. DOI: 10.1038/s41581-021-00518-z.
11. Hashmi MF, Benjamin O, Lappin SL. End-stage renal disease. In: *StatPearls* [Internet]. Treasure Island (FL): StatPearls Publishing; 2024 Jan-. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK499861/>.
12. Shirazian S, Grant CD, Aina O, Mattana J, Khorassani F, Ricardo AC. Depression in chronic kidney disease and end-stage renal disease: similarities and differences in diagnosis, epidemiology, and management. *Kidney International Reports*. 2016 Sep 20;2(1):94-107. DOI: 10.1016/j.ekir.2016.09.005. PMID: 29318209; PMCID: PMC5720531.
13. Marin AE, Redolat R, Gil-Gómez JA, Mesa-Gresa P. Addressing cognitive function and psychological well-being in chronic kidney disease: a systematic review on the use of technology-based interventions. *International Journal of Environmental Research and Public Health*. 2023 Feb 14;20(4):3342. DOI: 10.3390/ijerph20043342. PMID: 36834042; PMCID: PMC9961918.
14. Kalariya Y, Kumar A, Ullah A, *et al*. Integrative medicine approaches: bridging the gap between conventional and renal complementary therapies. *Cureus*. 2023 Sep 26;15(9):e46033. DOI: 10.7759/cureus.46033. PMID: 37900457; PMCID: PMC10602936.
15. Teri MSW. The role for nephrology social work in the new kidney disease paradigm-moving ahead by remembering how we got here. *The Journal of Nephrology Social Work*. 2019;43:9-22. DOI: 10.61658/jnsw.v43i1.33.
16. Remes O, Mendes JF, Templeton P. Biological, psychological, and social determinants of depression: A review of recent literature. *Brain Sciences*. 2021;11(12):1633. DOI: 10.3390/brainsci11121633. PMID: 34942936; PMCID: PMC8699555.
17. Murdeshwar HN, Anjum F. Hemodialysis. In: *StatPearls* [Internet]. Treasure Island (FL): StatPearls Publishing; 2024 Jan-. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK563296/>
18. Zambrano J, Romero P, Longley R, Huffman JC, Cohen-Bucay A, Celano CM. Well-being and health in kidney failure: A scoping review. *Journal of Academic Consultation Liaison Psychiatry*. 2022;63(4):384-393. DOI: 10.1016/j.jaclp.2022.02.008. PMID: 35278740; PMCID: PMC9308643.

19. Dubey A. Coping with chronic illnesses. In: Psychosocial Aspect of Health and Illness. Global Vision Publishing House; 2021.
20. Cassileth BR, Lusk EJ, Strouse TB, Miller DS, Brown LL, Cross PA, Tenaglia AN. Psychosocial status in chronic illness. *N Engl J Med.* 1984;311(8):506-511. DOI: 10.1056/NEJM198408233110805.
21. New England Journal of Medicine. Psychosocial status in chronic illness. *New England Journal of Medicine.* 1984;311(8):506-511. DOI: 10.1056/NEJM198408233110805.
22. Jiakponna EC, Agbomola JO, Ipede O, Karakitie LO, Ogunsina AJ, Adebayo KT, *et al.* Psychosocial factors in chronic disease management: Implications for health psychology. *International Journal of Scientific Research and Archives.* 2024;13(2).
23. Gandhi R. Mental health and physical well-being: A correlation. *International Journal of Advanced Psychiatric Nursing.* 2024;6:80-82. DOI: 10.33545/26641348.2024.v6.i1b.149.
24. Luo MS, Chui EWT, Li LW. The longitudinal associations between physical health and mental health among older adults. *Aging & Mental Health.* 2020;24(12):1990-1998. DOI: 10.1080/13607863.2019.1655706. Epub 2019 Aug 20. PMID: 31429303.
25. Jansen M, Chapman C, Richardson T, Elliott P, Roberts R. The relationship between mental and physical health: A longitudinal analysis with British students. *Journal of Public Mental Health.* 2022;21(3):218-225. DOI: 10.1108/JPMH-11-2021-0147.
26. Cho HJ, Lavretsky H, Olmstead R, Levin M, Oxman MN, Irwin MR. Prior depression history and deterioration of physical health in community-dwelling older adults—a prospective cohort study. *American Journal of Geriatric Psychiatry.* 2010;18(5):442-451. DOI: 10.1097/JGP.0b013e3181ca3a2d. PMID: 20220581; PMCID: PMC2860010.
27. Kimmel PL, Cukor D, Cohen SD, Peterson RA. Depression in end-stage renal disease patients: A critical review. *Advances in Chronic Kidney Disease.* 2007;14(4):328-334. DOI: 10.1053/j.ackd.2007.07.007.
28. Andrade C, Cruz MCN, Urrutia M, Pereira O, Draibe S, Martins LA, *et al.* Evaluation of depressive symptoms in patients with chronic renal failure. *Journal of Nephrology.* 2010;23:168-174.
29. Chen CK, Tsai YC, Hsu HJ, Wu IW, Sun CY, Chou CC, *et al.* Depression and suicide risk in hemodialysis patients with chronic renal failure. *Psychosomatics.* 2010;51(6):528-528.e6. DOI: 10.1016/j.psym.2010.04.003.
30. Kondo K, Antick JR, Ayers CK, Kansagara D, Chopra P. Depression screening tools for patients with kidney failure: A systematic review. *Clinical Journal of the American Society of Nephrology.* 2020;15(12):1785-1795. DOI: 10.2215/CJN.05540420.
31. Open University. Exploring the relationship between anxiety and depression [Internet]. Available from: <https://www.open.edu/openlearn/science-maths-technology/exploring-the-relationship-between-anxiety-and-depression/content-section-2>.