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Anxiety and Depression as Comorbidities in Haemodialysis Patients with Chronic Kidney Disease (CKD): Prevalence, Associated Factors, and Management

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Doris Uzoechi[1], Dwight Figueiredo[1*]

1. *Symbiosis International (Deemed University), Lavale, Pune, India.*

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ABSTRACT

Chronic disease conditions such as Chronic Kidney Disease (CKD) necessitate meticulous and carefully planned management strategies for better outcomes. Study and study again have indicated that Anxiety and depression is rampant among CKD patients (as high as 1 in 3 hemodialysis patients suffer either anxiety or depression or both) undergoing hemodialysis treatment. Surprisingly, although the data from previous studies stares in the face, little practical on-the-ground implementation is underway, particularly in developing nations to combat the comorbidities associated with hemodialysis treatment, such as anxiety and depression. Much is known about the causal and associated factors with anxiety and depression in hemodialysis patients, and particular studies have tried to investigate particular management strategies addressing particular factors/determinants that finally affect patient outcomes. In this review, we have highlighted relevant open access studies to understand the prevalence, associated factors, and management of anxiety and depression in hemodialysis patients. With backing evidence from such studies, in the management section, we have outlined a strategy for handling hemodialysis patients from the time they step into a dialysis centre as well as for patients currently undergoing hemodialysis treatment. Given the reality of resource shortages and the associated price tag, we are hopeful that hemodialysis patients are properly managed so that they can lead a decent quality of life.

INTRODUCTION:

Chronic Kidney failure (CKD) is a condition whereby the kidneys are unable to filter blood and remove excess fluid from the body; it is a condition that happens over a long period, which is irreversible. Kidney disease has been the main cause of death in the United States of America over the years and it is calculated that about 37 million adults in USA are CKD patient, and many are not diagnosed. It is also estimated that every 24 hours 360 people starts dialysis treatment for kidney failure and the leading cause of kidney failure in USA is high blood pressure and diabetes, which accounts for 3 out of 4 new cases.

Haemodialysis is a therapeutic procedure that uses the extracorporeal circulation of a patient's blood to ameliorate the azotaemia, fluid, electrolyte, and acid-base balance abnormalities, which are characteristic signatures of uremic syndrome. Haemodialysis is principally used for the management of acute and chronic renal or kidney failure that is refractory to conventional medical therapy. (Denise A. Elliott., 2000).

Anxiety is defined as a situation characterised by a disruptive feeling of uncertainty, dread and fearfulness. Depression is a mental health disorder characterized by persistence-depressed mood, hopelessness, sadness or loss of interest or pleasure in daily activities (Sadia Yaqoob et al., 2020, Cohen, S. D. et al., 2016). Anxiety and depression are frequently associated with patients undergoing haemodialysis. However, the psychological aspects that arise before or during haemodialysis treatment are not given adequate attention and care. This lack of attention and care could potentially affect treatment outcomes. (Cohen, S. D. et al., 2016).Many factors are responsible for anxiety and depression in haemodialysis patients such as, pain, low income, unemployment, low nutritional status, low recreational activities, duration of haemodialysis etc. Also concurrent with haemodialysis are insomnia, sexual dysfunction and the knowledge that they have to depend on people to survive (medical practitioners and family members). Due to these factors, patients undergoing haemodialysis with anxiety, depression or both are associated with a low quality of life.(Sadia Yaqoob et al.,2020, Pankaj Gaida et al.,2020, Daniella Christiana sampaio de Brito et al., 2019).

Exercise, relaxation therapy and cognitive behavioural therapy were found to be psychological management that were effective in the management of anxiety and depression, and were significantly proven to help control anxiety and depression among Haemodialysis patient greatly.

This review aims at analysing the studies that have been carried out on haemodialysis patients only, in order to get detailed information on the prevalence of anxiety and depression among haemodialysis patients, factors associated with anxiety and depression in haemodialysis patients, impact of anxiety and depression on haemodialysis patients and the management for anxiety and depression in haemodialysis patients.

The objective of this review is to understand the overall extent of psychological burden in haemodialysis patients:-

i. The prevalence of anxiety and depression among haemodialysis patients

ii. The factors associated with anxiety and depression among haemodialysis patients.

iii. The impact of anxiety and depression on haemodialysis patients.

iv. Better management that could help haemodialysis patients cope with anxiety and depression.

1. SIGNIFICANCE OF THE STUDY:

There has been a number of studies carried out to understand the emotional and psychological distress of patients suffering from chronic diseases such as:Cancer, Chronic Obstructive Pulmonary Disorders, heart diseases (Konstantinos Tsaras et al., 2018, A.M.H Krebber et al., 2014, Panagioti M. et al., 2014, Muhammad Omair Husain et al., 2021, Bruno Bordon et al., 2018, Delean D. et al., 2013.), However, since the diagnosis, treatment, and management of each disease is distinct, the prevalence and factors giving rise to emotional burden in each disease could have differential/varying contributions. For example, some diseases like CKD require constant monitoring and weekly dialysis regimes that disrupt patient's routines and productivity besides causing pain and other side effects of the dialysis procedure. Many studies have focused on the effectiveness of many interventions (both face-to-face as well as online digital platforms) to combat the negative effects of anxiety and depression in chronic disease afflicted patients. However, the area of Chronic Kidney Diseases patients undergoing hemodialysis has not been adequately studied regarding treatment and management of associated mental health issues. In

order to address this gap, we wanted to summarize literature relating to anxiety and depression in haemodialysis patients with a special emphasis of studies done in the developing world.

2. METHODS:

In this literature review, patients undergoing only haemodialysis and not other types of dialysis (i.e. peritoneal dialysis, ambulatory dialysis, home dialysis) have been included. The search for relevant articles was restricted to Google scholar and PubMed as these are widely accessible to the public as well as the scientific community, and are comprehensive repositories housing biomedical related literature. The Search strategy included the following keywords with various connectors such as "And" and "OR" in Google scholar and PubMed such as: hemodialysis, anxiety, depression, impact, factors, management .The following data was extracted from each article which is included in the table in the prevalence section (Section 4): the sample size, depression& anxiety scales, number of depressed and anxious patients, and the final outcome in terms of prevalence of anxiety or depression or both in each reviewed study.

Inclusion criteria:

i. Hemodialysis patients with age above 18 years.

ii. Studies done on CKD (all phases –phase I-IV) patient undergoing the process of haemodialysis and not other forms of dialysis.

iii. Studies measuring anxiety or depression or both using a verified and validated anxiety, depressive, or anxiety and depressive scale.

iv. Only published manuscripts that were open access and available online free of charge to the public.

Exclusion criteria:

i. Hemodialysis patients with age less than 18 years.

ii. Studies including other form of renal replacement therapies (mention the other forms not included in this study).

iii. Studies that are included in various grey literature sources (brochures, websites, thesis-unpublished) which have not been published as of now.

iv. Interviews/assessments conducted by clinicians (Psychiatrists/psychologists) for determining the patient's mental health status.

The reason for including participants above the age of 18 was to ensure that they were capable enough being able to adequately self-assess their symptoms of anxiety and depression. This is important given that in our review we chose manuscripts that measured the prevalence of anxiety and depression through self-assessment scales.

Concerning papers for factor analysis, only patients on hemodialysis were chosen to maintain uniformity in the population as the factors/determinants affecting anxiety and depression might vary based on the type of dialysis. Studies that focused on the factors giving rise to anxiety and depression were briefly reviewed, and papers addressing these factors were included to inform strategies for optimum handling of dialysis patients in clinical settings.

3. PREVALENCE RATE OF ANXIETY AND DEPRESSION IN HEMODIALYSIS PATIENTS

Someone is said to be depressed if he or she has possessed the symptoms of depression for 2 to 3 weeks continuously. Depression and its symptoms are quite frequently associated with CKD patients that require long-term dialysis for their management. These factors could be related to loss of appetite, sleep disorders, sex dysfunction, lack of family support, pains, and sometimes the inability to adapt to haemodialysis procedures and lifestyle modifications, and the knowledge that they will have to depend on others to survive (medical practitioners and family members).Depression can be assessed through some self- administered validated scales that have been proven by many researchers, namely: Hospital and Anxiety Depression scale (HADS), Beck's Depression Inventory (BDI) Scale, and the Patient Health Questionnaire (PHQ). These scales are generally accepted in clinical setting for self-assessing patients' moods and for clinical research. Using self-assessment scales to measure mood disorders help to manage the time& cost as compared to in-person structured clinical interviews by clinical professionals, particularly in developing countries, where the clinician/patient ratio is highly skewed.

Anxiety is another psychological disorder that is commonly found among patients of CKD undergoing the haemodialysis procedure. Anxiety as a disorder has not been sufficiently looked at as compared to depression in patients of CKD undergoing haemodialysis. Moreover, the association between anxiety and depression among CKD patients has not really been adequately studied among different populations. Anxiety can be diagnosed and studied with SCID (Structured Clinical Interview for Diagnostic and Statistical Manual of Mental Disorders-DSMIV) and with MINI (Mini International Neuropsychiatric Interview).

There are wide range of studies related to the psychological burden of haemodialysis patients using different instruments and tools to measure the rate of anxiety and depression. The assessment method used might affect the result; it can be structured a structured in-person clinical interview by a psychiatrists/psychologist or a self-rated questionnaires scale. However, there is a difference between prevalence rates when measured through self-assessment scales versus in-person structured clinical interviews. In order to maintain a suitable level of homogeneity, we chose studies that focused on developing countries (wherein studies are recent and few-and-far between compared to the developed world) using self-assessment questionnaires.

These studies below illustrate the prevalence of anxiety, depression or both:

High prevalence of anxiety &depression in predominantly adult haemodialysis populations:

A number of studies have focused on accessing the prevalence of depression among haemodialysis patients. In one such study carried out in Brazil (Saulo B V de Alencer et al., 2020.), the prevalence of depression among older people (>60 years) was 22.5 percent. This means that approximately 1 in 4 haemodialysis patients above 60 years were depressed or showed depressive symptomology, which was measured on the quality of Life Questionnaire.

In another study (Chrysoulavasilopoulou et al., 2015), exploring the impact of anxiety and depression on the quality of life in hemodialysis patients showed that anxiety and depression are related to low quality of life, which was measured by the Missoula VITAS Quality of Life Index MVQOLI. In this study, out of 395 hemodialysis patients, 47.8% were anxious and 38.2% were depressed, with the average total score for quality of life at 17.14.

In another study, (Abdelilah El Filali et al., 2017) assessing the prevalence of anxiety and depression, suicidal ideation, and the quality of life among hemodialysis patient showed that 34% were depressed and 25.2% were anxious. In this sample size of 103 hemodialysis patients, there was an association between anxiety and depression and suicidal ideation especially in married people.

A study focusing on (Saida Yaqoob et al., 2020.) measuring sexual dysfunction in relationship with depression and anxiety in female haemodialysis patients showed that borderline abnormal depression was independently linked to sexual dysfunction excluding sexual desire. Of the 48 females were enrolled in the study, depression and anxiety prevalence were 39% and 35% respectively.

In another study (EkramGoyal. 2019), a total of 49 patients were included, in the range of 15-60 years of age, the male gender were 75.5%. Patients that were depressed were 26%, 2% were diagnosed of anxiety and 2% were diagnosed of both anxiety and depression.

In another study, (Pankaj Gaida et al., 2020.) in India in Western Rajasthan of the 100 CKD patients undergoing hemodialysis, overall 66% were depressed and 61% were anxious. Further bifurcations showed that among depressed patients, 57.6% had mild depression, 28.8% had moderate depression, whereas 13.6% had severe depression. With regards to patient with anxiety disorder, 59% had mild anxiety, 24.6% had moderate anxiety and 16,4% had severe anxiety. Depression was more prevalent in the female gender (86%) than the male gender. The demographics in this study revealed that majority of the patients belonged to the age group of 41-60 years (54%) and in age group of 21-40 (44%), with an overall age group between 18-60 years.

A study carried out by Emilda Judith Rajan et al., 2016 in Chennai in India reported on the prevalence of mood disorders among dialysis patients. Fifty patients were recruited for the study, of which 32were males and 18were females. This study indicates that depression and anxiety have a negative relationship with the individual's physical performance and physical activity. The presence of depression increases the likelihood of the developing symptoms of anxiety that may complicate the treatment regimen of hemodialysis patients, which in return affects their quality of life.

In another study (83 patients) (Victoria Semaan et al., 2018) examining the prevalence of anxiety and depression among patients receiving haemodialysis showed that there was a high prevalence of anxiety (39.6%) and depression (40.8%) with 24.1% having both anxiety and depression disorders. Majority of patients were above 60 years of age. There was a relationship between educational attainment (48% achieved high school education) and living status with depression- illiterate patients were highly depressed while patients living with their family were highly anxious than those living alone.

In a study focusing on both anxiety and depression among hemodialysis patients (Georgia Gerogianni et al., 2018), shows a significant correlation between the level of anxiety and depression in hemodialysis patients, patients with high level of anxiety were found to have high level of depression as well and verse versa. In this study on 414 hemodialysis patients, 29.4% were found to be depressed, whereas35.90 % were found to be anxious.

In another study, (Min Zhang et al., 2014.) investigating the possible relationship between anxiety and depression, and physical performance in relatively healthy hemodialysis patients, shows that anxiety and depression are common, and are associated with impaired physical performance. In this study of 72 healthy hemodialysis patients and 39 normal adults, 43% were anxious and 33% were depressed.

In another anxiety-based study, Joel D. Kopple et al., 2017, examined prevalence as well as associated factors involved with anxiety (N = 246 patients). In this study, 32-51% reported anxiety when coming for dialysis, hearing an alarm sound, being connected for dialysis by a new person or seeing paramedics in dialysis unit. Moreover, 12-18% of which experienced severe anxiety with one or more of these events mentioned above. In terms of comorbidities, 46% of these patients were diabetic and more than half were males (58% were males).

In another study (Carolina Renz Pretto et al., 2020) analysing factors associated with depression among haemodialysis patients found 60.3 % to be depressed. Interestingly this study had a significant elderly male population (out of 183 haemodialysis patients, 66.4% were males and 55.2% were elderly people and 90.7% were retired). They were all adults from 18 years and above.

In another study focusing on clinical vignettes, Scott D. Cohen et al., 2016 reported that all three haemodialysis patients suffered from anxiety disorders. The data qualitative data obtained from these three patients in this report is summarized in the table below.

Table 1: Studies focusing on the prevalence of Anxiety & Depression among haemodialysis Patients

Characteristic	**clinical vignette 1**	**clinical vignette 2**	**clinical vignette 3**
Gender	Female	Male	Female
Age	65	28	75
HD duration	3 years	2 years	1 year
Symptoms	1. Decreased participation in centre activities. 2. Sleeping during most of her treatment. 3. Less outgoing and less involve in activities and social life at the centre.	1. Does not call or show up for appointments. 2. Does not like being told what to do. 3. He shortens treatment and demand to be removed from the hemodialysis machine immediately. 4. He becomes fidgety, agitated or sometimes verbally abusive when asked to wait.	After watching her long time neighbor loss consciousness while on dialysis. 1. She is often late for dialysis and sometimes never show up. 2. She started thinking so much about her dead husband.
Diagnosis	Severe Anxiety	He has panic disorder.	PTSD (post traumatic stress disorder)

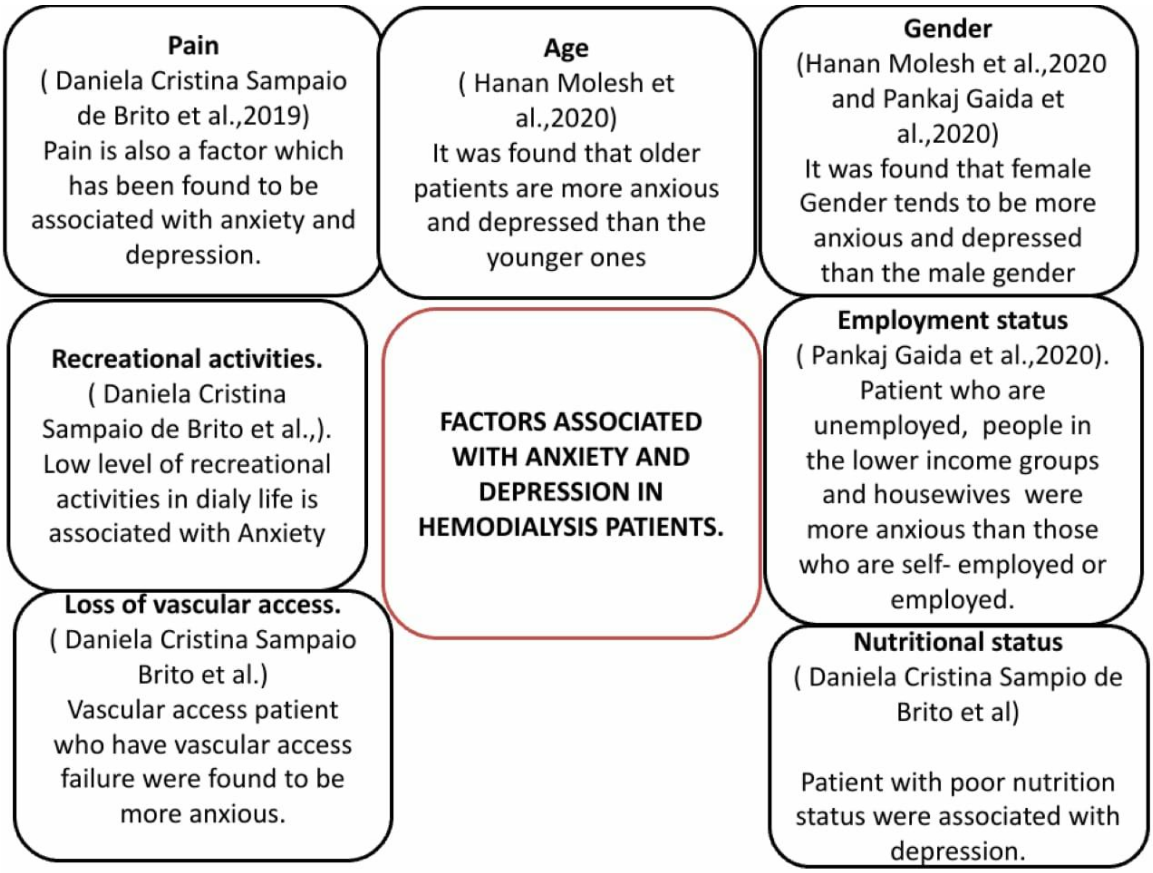
However, since there are not many studies in haemodialysis populations around the globe with respect to measuring anxiety, the true extent of the prevalence of anxiety remains to be understood.

(HADS – Hospital Anxiety &Depression Scale; BDI- Beck Depression Inventory; BAI-Beck Anxiety Inventory; HAMD- Hamilton Depression Scale.)

FIRST AUTHOR	SAMPLE SIZE	SCALES USED	DEPRESSED HEMO-DIALYSIS PATIENTS	ANXIOUS HEMO-DIALYSIS PATIENTS	OUTCOME
Saulo B V Alencer et al.	173	5- Item Geriatric depression scale.	22.50%	Not stated	Study shows that older patient have a high prevalence of depression. Depressed patients presented low quality of life.
ChrysoulaVasilopoulou et al.	395	HADS	41.80%	47.80%	Study shows that the relationship between anxiety, depression and low quality of life is highly significant.
Abdelilah El Filali et al.	103	DSM-V	35.00%	26.00%	This study confirms the high prevalence of anxiety and depression disorders among chronic hemodialysis patients and their association with altered quality of life.
SaidaYaqoob et al	48	HADS	39.60%	35.40%	This study shows that anxiety and depression can also affect the patient's sexual life, and it is done on only females.
EkramGoyal et al.	49	(HAM-D).	26.00%	12.20%	Psychiatric comorbidity was more common in patients in the age group of 41-60 years. Depression was the first co-morbidity on the list.
Pankaj Gaida et al.	100	HADS.	66%	61%	This study shows that depressive and anxiety disorders are highly prevalent in CKD patients undergoing hemodialysis
Victoria Semaan	83	HADS	40.80%	39.60%	This study was done to examine the prevalence of anxiety and

et al.					depression among patients receiving hemodialysis. Illiterate patients were highly depressed while patients living with their family were highly anxious than those living alone.
Georgia gerogiann i et al.	414	HADS	29.40%	35.90%	The overall study finding indicated a significant correlation between the level of anxiety and depression in hemodialysis patients. Patients with high level of anxiety had high level of depression and those with high depression scores had higher anxiety scores.
Min Zhang et al.	72	(BAI) (BDI) (HADS)	33%	43%	This study investigated the possible relationship between anxiety and depression, and physical performance in relatively healthy hemodialysis patients. It shows that anxiety and depression are common, and are associated with impaired physical performance
Joel D Kopple et al.	246	(BAI) (BDI)	Not stated	32-5I%	This study states that patients commonly experience anxiety, which is often more severe in hemodialysis patients.
Total Summary	**2147**		**35.8-36.4%**	**35.0-36.9%**	**Overall outcome: High Prevalence Factors: age, gender, pain, lack of recreational activities, employment status, loss of vascular access, low nutritional status.**

4. FACTORS ASSOCIATED WITH ANXIETY AND DEPRESSION IN HAEMODIALYSIS PATIENTS



Some studies have tried to address the sociodemographic factors have been associated with anxiety and depression in haemodialysis patients. Most of these studies have focussed on possible social, psychological, physical and clinical factors associated with anxiety and depression among patients undergoing routine haemodialysis.

In a study by Daniela Christina Sampaio de Brito et al., 2019, anxiety was associated with loss of vascular access over last twelve months, low level of recreational activities, and presence of bodily pain were associated with anxiety whereas poorer nutritional status and poorer general health status were associated with depression. In this study, educational status had no association with anxiety or depression. In other studies, focusing on factors (HananMosleh et al., 2020), older patients were found to be significantly associated with depression, with the male gender found to be more depressed than female gender. With regards to anxiety, the female gender was

found to be more anxious than the male gender. Similar outcomes according to gender, occupation, income, and duration of hemodialysis as significant factors contributing to depression and anxiety were reported in other studies (Pankaj Gaida et al., 2020). As in the above study, this study also stated that the female gender was found more anxious. However, unlike in the above study, the females were found to be more depressed than the males. In terms of occupation, house wives, farmers and unemployed patients were more depressed than self-employed and the labourer class of patients while undergoing hemodialysis. Female gender, a higher number of associated co- morbidities and post haemodialysis intercurrences, unsteady emotional and physical symptoms, inability to perform and need of assistance in day-to-day activities was positively associated with depression in other studies showing high depression burden in hemodialysis patients (Carolina Renz Pretto et al., 2020). Other studies also point to the fact that factors such as age, gender, marital status, educational level, supporting medical service, and history of visiting psychiatric clinic are associated with anxiety and depression in dialysis patients (Fatima Al-Nashri et al., 2022). In a cross-sectional study (a total of 72 patients and 39 normal people were recruited for the study) measuring the (Yi-Nan Li et al., 2016) association between Quality of Life (QoL), depression and anxiety, physical activities and performance in hemodialysis patients confirmed previous reports that decreased QoL as well as anxiety, depression, lower daily physical activities and reduced physical performance commonly occurs in hemodialysis patients.

5. IMPACT OF ANXIETY AND DEPRESSION ON DIALYSIS PATIENTS AND THEIR QUALITY OF LIFE.

Anxiety and depression are psychiatric disorders that have been shown to be associated with patient quality of life. Some studies have proven that anxiety and depression has affected the quality of life of majority of patients undergoing hemodialysis treatment. It was obvious that those patients with higher level of anxiety and depression had lower quality of life and those with lower level of anxiety and depression had a higher quality of life. In one such study, Fatima Al-Nashri et al., 2022 stated that quality of life were significantly lower among hemodialysis patients with anxiety and depression. There was a negatively moderate correlation between anxiety and depression and each quality of life domain. This study also indicated that there are

many factors associated with higher levels of anxiety and depression which consequently leads to a poorer quality of life.

In studies correlating anxiety and depression with quality of life, Chrysoulavasilopoulou et al., 2015 showed that patients with low levels of anxiety and depression had better quality of life. Quality of life score was associated with the level of depression after adjusting for possible confounders. More specifically, quality of life was 2.5 and 4.4 points lower for patients with moderate and high levels of depression respectively when compared to other hemodialysis patients.

6. MANAGEMENT FOR ANXIETY AND DEPRESSION IN HEMODIALYSIS PATIENTS

Because of the high prevalence of anxiety and depression and the impact that follows, some management for the treatment of anxiety has been mapped out by the nephrology community to aid in the improvement and remission of anxiety and depression among hemodialysis patients. According to Kidney Disease Outcomes Quality Initiative (KDOQI) guidelines, it is stated that the psychological status of every patient undergoing dialysis should be evaluated at the point of initiation of dialysis and then at least twice a year from dialysis onset, with a focus on anxiety and depression.

Many studies have reported on the management of anxiety and depression; some are pharmacological while others are non-pharmacological. Majority of the studies stated the fact that anxiety and depression are highly underrated and under diagnosed in hemodialysis patients. In addition; most of the study focused more on depression, because from the prevalence section, depression has a higher prevalence over anxiety.

A) Pharmacological management:

In a pharmacological approach (Betel Kalender et al.,2009) using antidepressant CITALOPRAM to treat depression has shown promising results. CITALOPRAM could can treat depression and improve quality of life of depressed hemodialysis patients. Psychotropic drug interventions--antidepressants, antipsychotics, mood stabilizers, hypnotics and Benzodiazepines (BZDs)— also showed promise in treating anxiety and depression (Chou- Yu Yeh et al., 2014). Interestingly in

this study nearly 70% of the selected patients were not aware of the symptoms of anxiety and depression or they did not perceive the need for help. Even those probably aware were reluctant to seek help because they were afraid of being stigmatized by the community. In conclusion, the findings suggest that major depressive disorder, a common psychiatric co-morbidity in patients on hemodialysis is generally undetected or not well managed in the clinical settings. Unfortunately, only a small portion of depressed patients receive treatment for their psychological illnesses, with even fewer receiving antidepressant treatment. This study shows that early detection is very important for effective work of treatment strategies (antidepressant drugs, psychotropic drugs, etc.).

In a study using the used a six-sigma method (Lingling Yang et al., 2021) to approach the management of depression in hemodialysis patient showed that patients with mild to moderate depression were effectively relieved by the six-sigma method. Six-sigma methodology is a novel method of hospital management especially applied in nursing homes. It has five procedures namely: - definition, measurement, analysis, improvement and control However, this method was not effective when it came to patients suffering from severe depression.

B) Psychological management:

A psychological management intervention using the Benson relaxation therapy method (done for 15 minutes daily over the period of 4 weeks) showed a significant difference between the experimental and control group (M.A Heirdari Gorji et al., 2014). This study only included participants who had been on hemodialysis for at least 2 months before enrolment into the study. In terms of demographics, this study included adults patients (18- 65 years old) who were predominantly married (71 participants out of 88) with fairly equal gender distribution (45% were females and 55% were males; N = 88). There was a high level of adherence with 80 out of 88 dialysis patients completing at least 55 sessions.

In another study (Blessyprabhavalsaraj et al., 2016), eighty hemodialysis patient were given a treatment course of Cognitive Behavioral Therapy (CBT). CBT was effective in managing anxiety and depression levels at the end of the therapy sessions (40 patients from each group, 33 from the experimental intervention group and 34 from the control group were able to complete the therapy ensuing for 10 weeks).

C) Pain management:

Pain is a debilitating state which serves to significantly affect the quality of life of the afflicted. In hemodialysis patients, who already persist with an existing chronic disease condition, managing acute and particularly chronic pain if and when it arrives is essential for their quality of life. Pain is said to lead to irritability, sleep disturbances, anxiety and depression. In the context of dialysis patients, pain occurs due to needle insertion, fluid shifts, cramps or headache, etc. In the context of dialysis, musculo-skeletal pain is most prevalent (59%) followed by neuropathic pain (40%), pain related to the hemodialysis procedure (35%), and lastly due to pain associated with vascular disease (20%).

A study showed that analgesics, in particular opioids, have a role to play in the management of chronic pain (Sara N Davidson et al., 2019). This study showed that for pain management of CKD patients suffering from acute and/or chronic pain, using strong opioids at low doses with careful titration is better than using the weak opioids. In such chronic disease conditions such as CKD, it is understood that the goal of this medication is to maintain adequate quality of life and not necessarily to completely resolve pain.

Other studies have also highlighted the need to resolve and to some extent treat chronic pain in dialysis patients; prevalence of chronic pain is 50-80% among adults getting hemodialysis, whereas 50% have chronic moderate to severe pain. Opioids such as oxycodone and hydrocodone have been shown to be more effective as compared to other drugs to combat acute pain with morphine being used for chronic pain.

Given the risks of toxicity of dialysis patients on drugs due to CKD, non-opioid pharmacotherapies including topical agents such as lidocaine, acetaminophen, or paracetamol, anticonvulsants, antidepressants (serotonin) should be considered, and if opiods are chosen as a treatment option, the dose of opioid should be optimized before considering use- this has to be optimized for each individual patient.

D) Loss of vascular access management:

Maintaining vascular access patency in dialysis patients represents a tremendous challenge (Ahram Han et al., 2021). Loss of vascular access is common and could be due to stenosis,

thrombosis and steal syndrome. To circumvent this problem, a systematic review has showcased that two interventions are capable of maintaining vascular access for dialysis patients with one being superior over the other (drug coated balloon (DCB) angioplasty is superior compared to plain balloon (PB) angioplasty in treating arteriovenous access stenosis). In conclusion, paclitaxel coated DCBs reduced the risk of loss of target lesions patency and circuit patency in arteriovenous access stenosis compared to PBs. This treatment is also applicable to Thrombosis and steal syndrome.

E) Recreational activities (Exercise) management:

A systematic review (Mei Huang et al., 2019) showed that aerobic exercise or combined exercise for at least 8 weeks, 3 times weekly, is of great benefit to the physical condition in hemodialysis patients. In other studies trying to ascertain impact of physical exercise training in Hemodialysis patients suffering from anxiety and depression reported reduced levels of anxiety and depression, with greatest improvement seen in elderly patients and patients with higher levels of depression and anxiety at the beginning of the regular physical exercise program (WiolettaDziubek et al., 2016). Exercises included were straightening/bending of the knees, straightening/bending at the hip, adduction/abduction, light weight lifting (1-4kg).

7. LIMITATIONS OF THE STUDY:

i. Papers referred to in this review were selected based on the exclusion and inclusion criteria; therefore, it could be possible that important studies in some areas have been overlooked.

ii. Since thesis and unpublished databases were not looked at (i.e. grey literature), publication bias could be a factor that needs to be considered in our analysis,

iii. Only Pubmed and Google Scholar were used to search for articles/manuscripts.

iv. No statistical overall findings were presented in this review.

v. Only Open Access articles were taken for this review thereby raising the possibility to missing relevant non-accessible studies.

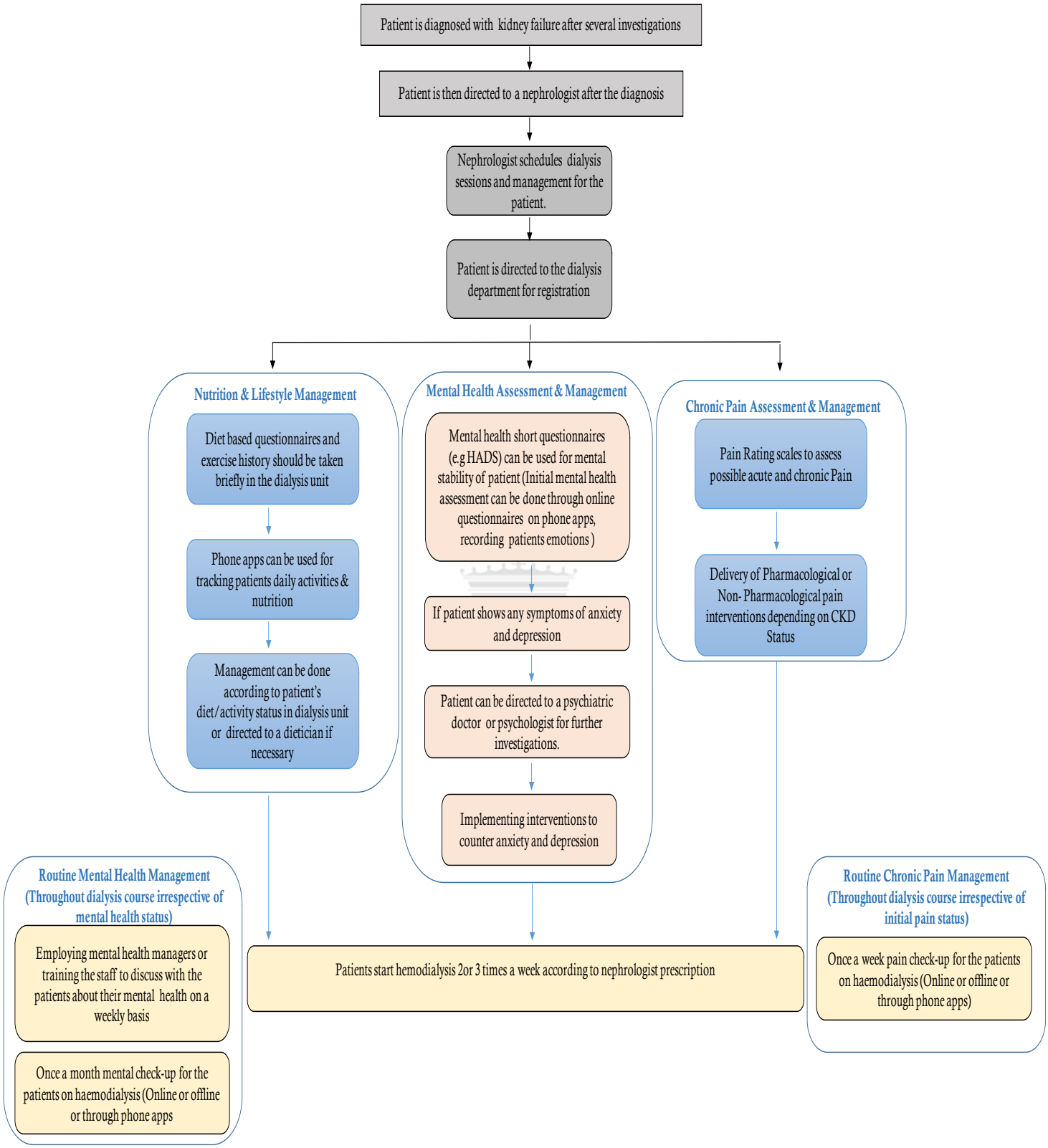
vi. Only articles written in English were considered.

8. DISCUSSION:

Many factors seems to bring about anxiety and depression in haemodialysis patients such as, pain, low income, unemployment, low nutritional status, and low recreational activities. Duration of haemodialysis is also concurrent with insomnia, sexual dysfunction, and the knowledge that they have to depend on others to survive (medical practitioners and family members). Due to these factors patients undergoing haemodialysis with high rate of anxiety and depression are associated with low quality of life (Sadia Yaqoob et al., 2020, Pankaj Gaida et al., 2020, Daniella Christiana sampaio de Brito et al., 2019).

There is also lack of screening procedures for mental health status in the dialysis centres and units. Many digital phone based interventions could be used for mental health screening interventions (E.g.Sanvello, Talklife, Mindshift, Talkspace, 7 cups, Moodtools, Booster Buddy, Sleep bot, what's up and so on).

Proposed plan for treatment of dialysis patients:



This treatment plan consist of diet, exercise and mental health check-up management, evaluation and rehabilitation for dialysis patient in the dialysis unit, and instruction to refer them to a psychologist or psychiatric doctor if necessary. If this plan were applied to the dialysis patient mental health care, it would help to improve their quality of life by reducing the high prevalence of anxiety and depression among haemodialysis patients.

Due to lack of research studies, further randomised controlled trials (RCTs) studying the effectiveness of the above proposed treatment plans needs to be undertaken as soon as possible.

9. CONCLUSION:

Haemodialysis patients with CKD often do have psychiatric challenges as anxiety and depression. Some existing literature has thrown light on the factors, impact and ways whereby these psychiatric challenges can affect haemodialysis patients as well as the outcome of the treatment. If not taken care of, anxiety and depression in overall can affect the patient's haemodialysis treatment and mortality. It is very essential that doctors should look into the issue of addressing anxiety and depression among CKD patients.

There is high prevalence of anxiety and depression in haemodialysis patients with CKD in comparison to other chronic diseases; it is of high importance that it should be attended to. It is quite unfortunate that in comparison to other chronic illness such as cancers, the study of psychological challenger related to CKD patients is way too less. Some epidemiological research studies have shown the factors associated to the development of anxiety and depression among haemodialysis patients. Patients with some social, psychological and clinical features are found to be more prone to depression. In addition, these features help medical practitioners to be able to identify and have quick access to anxious and depressed more easily.

Implementing a routine check for anxiety and depression would be a very good step for haemodialysis patients, and following it up with the appropriate treatment when it is dictated. Some treatment to manage anxiety and depression in haemodialysis patients with CKD has shown some results. Pharmacotherapy and psychotherapies are some of the recognised management that can help haemodialysis patients with anxiety and depression. The pharmacological treatment should be strictly monitored to avoid interaction with other drugs that

are been taken. These patients must be properly taken care of in order for the treatment to be more effective.

Implicit attention should be given to all the signs that would accompany the treatment process of the patients with anxiety and depression, and also monitor the reoccurrence of those symptoms in them even after it has been carefully managed in order to make sure that the patients doesn't go back into a critical stage of anxiety and depression.

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