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Research Article

Assessing The Benefits, Risks, Psychological Issues And Costeffective Analysis In Peritoneal Dialysis And Hemodialysis

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ABSTRACT

To investigate the perspectives of peritoneal dialysis patients regarding their body image, assess their quality of life, and evaluate their emotional intelligence levels, providing valuable insights for their care and support. Methods. This study analysed data from 739 ESRD patients registered in the Chinese National Renal Data System between 2010 and 2018. Results. Compared to hemodialysis patients, Peritoneal dialysis patients had a higher level of emotional intelligence and a lower level of mental health. In addition, compared to Hemodialysis patients, patients with Peritoneal dialysis had poorer dietary behaviour, nutrient intake, and nutritional status. Conclusions. The research highlights the need to enhance the quality of lives of dialysis patients, with a focus on elderly individuals and those with peptic ulcer disease, and highlights the potential benefits of Peritoneal in this context. The study explores the implications of peritonitis, fluid choice, and PD membrane status on TF.

INTRODUCTION

The renal system removes waste and excess fluids from the body. It emphasises that end-stage renal disease (ESRD) may necessitate renal replacement therapy with two primary dialysis methods: haemodialysis (extracorporeal) and peritoneal dialysis (intracorporeal)[1]. After Thomas Graham's development of the dialysis concept in the 19th century, the first clinical hemodialysis to treat kidney failure was pioneered by Willem (Pim) Kolff in 1942[2]. Subsequently, there was a gradual rise in its utilisation beginning in the 1950s[3]. Peritoneal dialysis followed a similar trajectory[4]. Today, the prevalence of dialysis is experiencing exponential growth, driven by enhanced patient outcomes and increased adoption in lower-income countries[3]. However, it's important to note that dialysis remains inaccessible to all eligible candidates in every region[5]. End-stage renal disease (ESRD) has a significant negative impact on patients, affecting their social, financial, and psychological well-being[6].

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Among dialysis patients, common challenges include chronic anaemia, complications related to bone mineral disease, achieving dialysis adequacy, and dealing with issues associated with the dialysis process. Anaemia is linked to a lower quality of life, increased hospitalisation rates, and higher mortality[7]. Chronic kidney disease mineral bone disease (CKD-MBD) is associated with a decline in general health, reduced quality of life, more hospital admissions, increased cardiovascular risks, and greater mortality[8]. Each dialysis modality comes with specific requirements for achieving adequacy, which some patients may struggle to meet. Inadequate dialysis or lower-than-prescribed dialysis doses can result in a diminished quality of life, long-term complications, and a higher risk of mortality [9].

Complications related to the dialysis process and non-compliance with the chosen dialysis modality can lead to deteriorating health, more hospital admissions, and an elevated risk of morbidity and mortality. Despite the substantial amount of research on the mental and physical health of ESRD patients, there is conflicting evidence regarding the relationship between dialysis modality and outcomes [10]. Therefore, it is crucial to investigate this relationship, specifically in hemodialysis (HD) and peritoneal dialysis (PD) patients, to gain a better understanding of these complex issues. While studies on emotional intelligence's impact have primarily focused on hemodialysis patients, this study aims to investigate the perspectives of peritoneal dialysis patients regarding their body image, assess their quality of life, and evaluate their emotional intelligence levels, providing valuable insights for their care and support[11,12]. The choice between PD (continuous ambulatory PD or continuous cycling PD) and hemodialysis (HD) should be guided by medical and social conditions, geographical factors, and, most importantly, the patient's preferences[13,14]. However, it's essential that patients receive comprehensive education about these modalities to make informed choices, which unfortunately doesn't always happen. Consequently, physician preferences, experience, and reimbursement issues may also influence the choice of modality[15,16].

DEFINITION

Chronic renal failure is a condition involving a decrease in the kidneys' ability to filter waste and fluid from the blood. It is chronic, meaning that the condition develops over a long period of time and is not reversible. The condition is also commonly known as chronic kidney disease (CKD). Chronic renal failure is typically caused by certain other medical conditions that put strain on the kidneys over time, including diabetes, high blood pressure or hypertension and long-term inflammation of the kidneys. Early symptoms of reduced kidney function include urinating more frequently, high blood pressure and swelling of the legs[17].

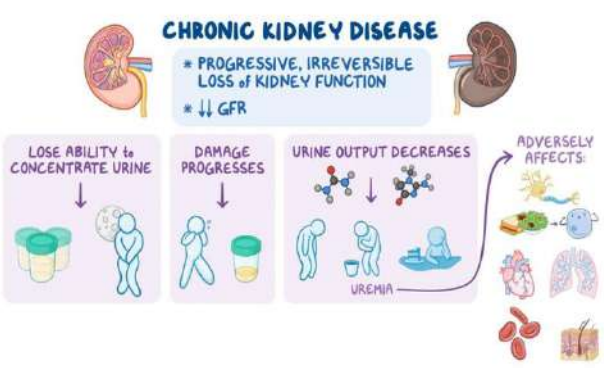

Fig no- 01

TYPES OF CHRONIC RENAL DISEASE

Prerenal (lower renal perfusion pressure), intrinsic renal (pathology of the arteries, glomeruli, or tubules-interstitium), or postrenal (obstructive) disease processes are the three main types from which CKD can occur.

Prerenal Disease

Acute tubular necrosis (ATN) and other episodes of an intrinsic kidney injury are more likely in patients with chronic prerenal disease, which develops in conditions like chronic heart failure or cirrhosis with persistently decreased renal perfusion. Over time, this causes the kidneys to gradually lose their ability to function.

Intrinsic Renal Vascular Disease

Nephrosclerosis, which results in chronic damage to blood vessels, glomeruli, and tubule interstitium, is the most prevalent chronic renal vascular disease. The other renal vascular illnesses include fibro-muscular dysplasia and renal artery stenosis, which develop over months or years and result in ischemic nephropathy, which is characterized by glomerulosclerosis and tubulointerstitial fibrosis[18].

Intrinsic Glomerular Disease (Nephritic or Nephrotic)

The presence of aberrant urine microscopy, red blood cell casts and dysmorphic red cells, sometimes white blood cells (WBCs), and varying degrees of proteinuria are suggestive of a nephritic pattern[19]. Infective endocarditis, post-streptococcal GN, shunt nephritis, IgA nephropathy, lupus nephritis, Goodpasture syndrome, and vasculitis are the most frequent causes[20]. An inactive urine microscopic examination with few cells or casts and protein uria typically in the nephrotic range (more than 3.5 gm per 24 hours) are linked with nephrotic patterns. Amyloidosis, membrane GN, membranoproliferative GN (Type 1 and 2 and linked with cryoglobulinemia), minimum change disease, focal segmental glomerulosclerosis, membranous GN, and diabetic nephropathy are the most prevalent causes.

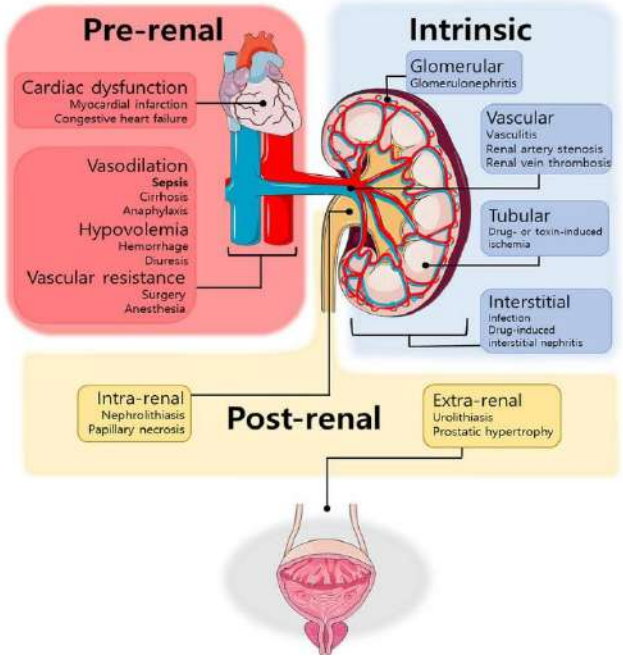

Fig no- 02

Intrinsic Tubular and Interstitial Disease

That is inherent the most prevalent chronic tubulointerstitial condition is polycystic kidney disease (PKD). Other causes include nephrocalcinosis, which is most frequently brought on by hypercalcemia and hypercalciuria, sarcoidosis, Sjogren syndrome, reflux nephropathy in children and young people, [21] sarcoidosis, and Sjogren syndrome. The Mesoamerican nephropathy, which affects agricultural labourers from Central America and some regions of Southeast Asia, is becoming more widely recognized. It is a relatively high incidence of CKD of unclear etiology [22]

Postrenal (Obstructive Nephropathy)

Nephrolithiasis, abdominal/pelvic tumours with a mass effect on the ureter(s), or prostatic illness are the most prevalent causes of chronic blockage. Chronic ureteral blockage can occasionally be caused by retroperitoneal fibrosis [23]. People with different medical disorders that harm the nephrons—the tiny kidney cells responsible for filtering waste and fluid from the blood—often have chronic renal failure. Nephron damage is a major cause of renal failure.

STAGES OF CHRONIC KIDNEY DISEASE

CKD is typically categorized into five stages based on the glomerular filtration rate (GFR) and the presence of kidney damage:

Stage 1:

Kidney damage with normal or increased GFR (>90 mL/min/1.73 m²). The Kidney damage is minimal in Stage 1 CKD. Although the kidneys are still functioning normally, we can be experiencing symptoms of renal impairment or actual kidney damage. If have Stage 1 CKD, you have protein in the urine but a normal estimated glomerular filtration rate (eGFR) of 90 or above. You are in Stage 1 CKD if protein is detected on its own.

Stage 2:

Mild reduction in GFR (60-89 mL/min/1.73 m²) with evidence of kidney damage. The estimated

glycogen level has decreased to 60–89 in Stage 2 CKD. That being said, might not experience any negative health impacts because kidneys can still filter blood as effectively as they should. We have a lot of control over how quickly our kidneys deteriorate, even if the damage may not be completely reversed. Protein in our urine may or may not be present as well.

Stage 3:

Moderate reduction in GFR (30-59 mL/min/1.73 m²), divided into: When kidneys reach Stage 3 chronic kidney disease (CKD), they have mild to moderate impairment and are less effective in removing waste and fluid from our circulation. our body may get overloaded with this waste, which could then start to negatively impact other organs like our blood pressure, anaemia, and bones. Uremia refers to this accumulation of waste.

Using your eGFR as a guide, stage 3 CKD is divided into two substreams:

Stage 3a:

GFR of 45-59 mL/min/1.73 m².

Stage 3b:

GFR of 30-44 mL/min/1.73 m².

Stage 4:

Severe reduction in GFR (15-29 mL/min/1.73 m²). If have moderate to severe kidney impairment and an eGFR between 15 and 29, We are considered to have stage 4 CKD. The ability of your kidneys to filter waste from your blood is compromised. Body may accumulate this waste, which could lead to many health issues like high blood pressure, heart disease, and bone disease. Our hands and feet may swell, and you may experience lower back ache as symptoms. This is the final phase prior to renal failure. To prevent kidney damage and prepare for potential kidney failure treatments, it's critical to schedule routine check-ups with a nephrologist, or kidney doctor.

Stage 5:

Kidney failure (GFR <15 mL/min/1.73 m² or on dialysis) When eGFR is less than 15 and have substantial kidney damage, we are considered to have stage 5 CKD. Your kidneys are failing or have already ceased functioning, and are extremely close to losing them. The accumulation of waste products in the body due to the failure of our kidneys to filter waste from your blood can lead to various health issues and severe illness. Dialysis or renal transplantation are two possibilities for treatment when our kidneys fail[77-105].

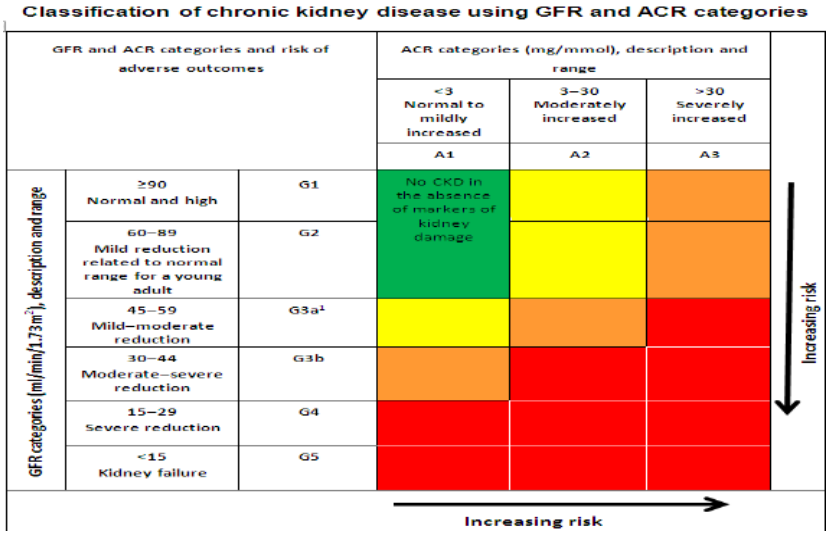

Fig no- 03

ETIOLOGY

Globally, there are many different conditions that can lead to chronic kidney disease (CKD), and the ones that do so most frequently are listed below:

- Type 2 diabetes mellitus (30% to 50%)
- Type 1 diabetes mellitus (3.9%).
- Blood pressure (27.2%)
- Primary glomerulonephritis(8.2%)
- Nephritis chronic tubulointerstitial (3.6%)
- Cystic or hereditary conditions (3.1%).
- Secondary vasculitis or glomerulonephritis (2.1%)
- Neoplasms or plasma cell dyscrasias (2.1)
- Less than 1% of those with ESRD in the United States have Sickle Cell Nephropathy (SCN), according to research[24,25].

Chronic renal failure can also result from less frequent diseases, such as:

- Kidney polycystic disease and various genetic diseases
- Nephrotic syndrome, also known as nephritis and glomerulonephritis, is a disorder that affects the glomeruli 9 and may be brought on by a number of illnesses, including lupus and strep throat.
- The kidneys are inflamed.
- Recurrent renal stones and kidney infections[26].

Chronic renal failure is more likely to eventually develop in those who have some type of urinary tract or kidney abnormality. Once the kidneys have significantly lost function, it may be impossible for them to recover, and the patient may develop end-stage renal disease [27,28].

PATHOPHYSIOLOGY

Contrary to chronic and prolonged insults from chronic and progressive nephropathies, which develop to progressive kidney fibrosis and destruction of the natural architecture of the kidney, acute kidney injury (AKI) heals completely with full functional recovery. The glomeruli, tubules, interstitium, and arteries, which make up the kidney's three compartments, are all impacted by this. A histological examination reveals glomerulosclerosis, tubulointerstitial fibrosis, and vascular sclerosis among its symptoms. Scarring and fibrosis are multistage processes that result from a complicated, overlapping series of events.

- Damaged kidneys are infused with external inflammatory cells.
- Intrinsic renal cells are activated, multiply, and die (through mesangiolysis, necrosis, apoptosis, and podocytopenia)
- Extracellular matrix (ECM)-producing cells, such as myofibroblasts and fibroblasts, are activated and grow rapidly.
- ECM is being deposited, replacing the conventional architecture.[29,30]

Hyperfiltration

- The first to propose the maladaptive alterations that follow renal damage were Brenner et al. in their seminal studies.
- The group demonstrated that there are notable changes in glomerular hemodynamics following a substantial loss of nephron mass.
- The alterations cause an increase in the glomerular filtration rate of a single nephron, known as hyperfiltration, which results in glomerular hypertension.
- A drop in preglomerular arteriolar resistance more than a decrease in postglomerular resistance, with a net vasoconstrictive effect on the efferent arteriole, causes an increase in glomerular plasma flow and hydrostatic pressure, which leads to hyperfiltration.[31,32]
- The RAAS system's activation is what causes the changes that are seen.
- First, the juxtaglomerular apparatus releases more renin in response to the lower perfusion pressure and solute transport to the macula

densa. After angiotensinogen is converted by renin to angiotensin I, angiotensin converting enzyme (ACE) produces angiotensin II.[33]It has been demonstrated that angiotensin II is primarily responsible for the kidney's maladaptation to severe injury.

- The majority of animal models used to study glomerular hypertension and hyperfiltration exhibit progressive glomerular sclerosis and ultimately proteinuria, which often develops at a rate that is linear in relation to the degree of nephron loss.[34,35,36]
- In addition, research on the prevention or management of single nephron GFR and glomerular hypertension has consistently demonstrated a decrease in the rate at which renal illness progresses.[37,38] It is suggested that ACE inhibitors, angiotensin receptor blockers (ARBs), and dietary protein restriction be used as therapies.[39]

Inflammation

- Angiotensin II has also been linked to and increase in inflammation after renal injury.
- It has been shown to activate the transcription factor NF-κB, an important player in the inflammatory response mediating transcription of several cytokines and chemokines.[40]
- ATII has also been shown to stimulate endothelin-1 leading to the recruitment of T-cells and macrophages.[41]
- Beyond that, it upregulates the expression of adhesion molecules notably integrins, intracellular adhesion molecule-1, and vascular cellular adhesion molecule-1 all of which lead to and increase in leukocyte concentration in the area.
- This creates a vicious cycle as lymphocytes can be a source of angiotensin II themselves amplifying its maladaptive effects. [42,43]

Accelerated Fibrosis

- In addition, irrespective of the alterations in hemodynamics, the rise in angiotensin II has been directly linked to faster fibrosis in the remaining nephrons.
- Extracellular matrix (ECM) enlargement is believed to be a direct result of angiotensin II's actions in the glomerular microenvironment.
- It's been demonstrated that angiotensin II increases the amount of mRNA in cultured mesangial cells that codes for type I procollagen and fibronectin.
- The increase in TGF- expression, which further stimulates the creation of ECM proteins, amplifies this impact.[44]
- To avoid fibrotic glomerular alterations, normal renal tissue must maintain a balance between ECM production and breakdown.

Angiotensin II upsets this equilibrium in addition to increasing the synthesis of ECM.

- By activating the ATI receptors, it causes the plasminogen activator inhibitor-1 (PAI-1) and tissue inhibitor of matrix metalloproteinases-1 (TIMP-1) to work together to tip the scales in favour of ECM buildup.
- The process known as epithelial-to-mesenchymal transition (EMT), in which tissue epithelial cells change into active fibroblasts, is another way to speed up the fibrosis process. Despite being known as a physiological mechanism during embryologic development, it is now understood to be a process that supplies fibroblasts during organ fibrosis following damage.
- In an experimental setting, it was discovered that the renal tubular epithelial cells are the source of more than one-third of the fibroblast at the site of renal damage.TGF-, which is frequently raised after renal damage and is the paradigmatic factor connected to EMT, is also induced locally by epidermal growth factor (EGF), insulin growth factor II (IGF-II), and fibroblast growth factor (FGF-2).[45]

SIGNS AND SYMPTOMS

People who are plagued with chronic renal failure frequently don't exhibit any symptoms in its early stages. However, the following signs and symptoms might appear in the early stages of chronic renal failure. [46,47] The need to urinate more often urine might be frothy and pale, the legs swelling, Weak appetite and Loss of weight.

Affected individuals may have additional symptoms as the illness worsens, such as:

- Muscle twitches or cramping
- Brown patches appearing on the skin
- Edema getting worse, especially around the eyes, ankles, and feet
- Drowsiness or a lack of focus
- Feeling exhausted and sluggish
- Bleeding
- Blood in the Urine
- Amenorrhea (halt of periods)
- Dry, itchy skin
- Infection susceptibility was increased
- Vomiting and diarrhoea. [48,49]

DIAGNOSIS

The diagnosis of chronic kidney disease (CKD) involves several tests and procedures to assess kidney function and identify the underlying causes. Here's an explanation of each:

1. **Blood Tests:**

These tests measure the levels of waste products like creatinine and urea in your blood. Elevated levels of these substances can indicate impaired kidney function.

2. **Urine Tests:**

Analyzing a urine sample helps identify abnormalities that may signal chronic kidney failure. It can also assist in determining the cause of chronic kidney disease.

3. **Imaging Tests:**

Ultrasound is commonly used to examine the kidneys' structure and size. Other imaging techniques such as CT scans or MRIs might be utilized in some cases to provide detailed images of the kidneys.

4. **Kidney Biopsy:**

In some situations, a kidney biopsy may be recommended. This procedure involves extracting a small sample of kidney tissue for examination. It's typically performed using a thin needle inserted through the skin into the kidney. The tissue sample obtained is sent to a laboratory for testing, helping to identify the specific cause of the kidney problem. These tests collectively aid in diagnosing chronic kidney disease, determining its severity, identifying potential complications, and guiding appropriate treatment strategies. The choice of tests and procedures is based on the individual's symptoms, medical history, and the doctor's clinical judgment.[50]

MANAGEMENT OF CHRONIC RENAL FAILURE

1. **Angiotensin-Converting Enzymeinhibitors:**

Angiotensin-converting enzyme inhibitorsare a class of medications that help lower blood pressure and can protect our kidneys. They're used to treat cardiovascular conditions like high blood pressure, heart failure, diabetes-related kidney disease and more. Angiotensin is a peptide hormone that plays a crucial role in regulating blood pressure and fluid balance in the body. There are several forms of angiotensin, but the two primary forms involved in the regulation of blood pressure are angiotensin I and angiotensin II. Angiotensin I is formed when the enzyme renin acts on a protein called angiotensinogen, which is produced by the liver. Angiotensin I is relatively inactive regarding blood pressure regulation. Angiotensin-converting enzyme (ACE), primarily found in the lungs but also present in other tissues, converts angiotensin I into angiotensin II. Angiotensin II has various effects on the body, some of which contribute to an increase in blood pressure. One of its significant

actions is vasoconstriction, which narrows blood vessels and thereby raises blood pressure.

Regarding the kidneys, angiotensin II affects them in several ways:

1. **Reduction of Sodium and Water Excretion:**

Angiotensin II acts on the kidneys to limit the excretion of sodium (salt) and water. By constricting blood vessels within the kidneys and altering the function of specialized structures (such as the glomeruli and tubules), it reduces the amount of sodium and water that is excreted in the urine. This retention of sodium and water helps to increase blood volume and blood pressure.

2. **Stimulation of Aldosterone Release:**

Angiotensin II stimulates the release of aldosterone from the adrenal glands. Aldosterone is a hormone that further enhances the reabsorption of sodium and water by the kidneys, promoting fluid retention and elevating blood pressure.[51]

Eg: Captopril, Enalapril, Benazepril, Ramipril

2. **ANGIOTENSIN RECEPTOR BLOCKERs:**

ARBs lower blood pressure by counteracting the effects of angiotensin II, which results

in smooth muscle relaxation and vasodilation. They also decrease plasma volume, increase renal salt and water excretion, and inhibit cellular hypertrophy. Although they operate via a different mechanism, ARBs have the same effects as ACE inhibitors. ARBs also get around some of the drawbacks of ACE inhibitors, which don't just stop angiotensin I from becoming angiotensin II, but also stop bradykinin from being degraded by ACE. Stroke rates in patients receiving ARB treatment were much lower than in those receiving active controls in clinical studies. RAS may play a role in preventing stroke, according on data on ARBs and other medications that activate it. Clinical studies have also shown that ARBs have a protective impact against CV mortality, stroke, HF, and newly developed atrial fibrillation. The role of such medicines in enhancing CVoutcomes is likely to be confirmed by ongoing trials and could even be expanded. Thiazide diuretic combination can considerably boost efficacy. In individuals with diabetes and hypertension, ARB medication significantly slows the progression of nephropathy, and in those with LV dysfunction, it lowers the risk of cardiovascular events. ARB therapy is an alternative to ACE inhibitor therapy in intolerant patients ARBs show the lowest incidence of side effects compared with other antihypertensive drugs. The ARBS have advantage over ACE inhibitors since they didn't produce dry cough.[52]

Examples: Losartan, Candesartan, Irbesartan, Valsartan, Telmisartan.

3. **PHOSPHATE BINDERS:**

Phosphate binders, also known as phosphorus binders, are medications commonly used to lower phosphate levels in individuals with conditions such as chronic kidney disease (CKD) or other disorders where there's difficulty in regulating phosphate levels in the body. Phosphate is a mineral that plays a crucial role in various bodily functions, including bone health, energy metabolism, and cellular structure. Phosphate binders work by binding to dietary phosphate in the digestive tract, preventing its absorption into the bloodstream. This action helps reduce the amount of phosphate available for absorption and subsequently lowers phosphate levels in the body. Phosphate is a type of electrolyte. Electrolytes are minerals that have a natural positive or negative charge when dissolved in water or other body fluids, such as blood. Our body needs phosphate to help form bones and teeth. It also helps our cells produce energy and form cell membranes and deoxyribonucleic acid (DNA). Hyperphosphatemia is a complication of CKD. Phosphate binders help prevent the progression of bone disorders that develop from

hyperphosphatemia (chronic kidney disease-mineral and bone disorder, or CKD-MBD).[53,56] Eg: Calcium carbonate, Sucroferric oxyhydroxide, Sevelamer, Lanthanum carbonate.

4. DIURETICS:

Diuretics, also known as water pills, are medications primarily used to increase the production of urine, leading to the removal of excess water and salts from the body. These drugs are commonly prescribed to manage conditions like high blood pressure, heart failure, kidney problems, and edema (fluid retention). [54,57] There are different classes of diuretics, each working in various ways within the kidneys to promote urine production:

A. Thiazide Diuretics:

These are often the first choice for treating high blood pressure. They act on the distal tubules of the kidneys, reducing the reabsorption of sodium and chloride, thereby increasing urine output.[54] Eg: hydrochlorothiazide, chlorthalidone

B. Loop Diuretics:

This class is more potent and often used in conditions where rapid diuresis is necessary, such as severe edema or heart failure. Loop diuretics act on the ascending loop of Henle in the kidneys, blocking sodium and chloride reabsorption.[55] Eg: furosemide or bumetanide.

C. Potassium-Sparing Diuretics:

They work by allowing the body to get rid of excess water and sodium while retaining potassium. This class is often used in combination with other diuretics to prevent potassium depletion.[56] Eg: triamterene or amiloride.

5. TREATMENTS FOR BONE PRESERVATION:

Supplements containing calcium and vitamin D can help prevent weak bones and reduce your risk of fracture. To reduce the level of phosphate in your blood and shield your blood vessels from calcium deposits, you may also take a drug called a phosphate binder (calcification).[58]

NON- PHARMACOLOGICAL TREATMENT

- Avoid items that are enhanced with salt: Avert items that have salt added. Reduce the quantity of sodium you consume on a daily basis by staying away from salt-added items, which include numerous convenience foods like canned soups, frozen dinners, and fast food. Processed meats and cheeses, canned veggies, and salty snack foods are among the other foods that have added salt.
- Select items that are lower in potassium: Bananas, oranges, potatoes, spinach, and tomatoes are examples of foods high in potassium. Foods low in potassium include grapes, strawberries, apples, cabbage, carrots, and green beans. Remember that potassium is present in many salt substitutes, so if you have kidney failure, you should usually stay away from them.
- Restrict your protein intake: A nutritionist will calculate the approximate number of grammes of protein you require daily and provide suggestions accordingly. Foods high in protein include beans, milk, cheese, eggs, and lean meats. Cereals, breads, fruits, and vegetables are examples of low-protein foods.[57,58]

DEFINITION - DIALYSIS

In general, the process of dialysis involves the bidirectional flow of molecules over a semipermeable membrane. Clinically, this movement occurs in and out of the blood through a semipermeable membrane. Hemodialysis (HD) or hemofiltration (HF) is the term for the procedure when blood is exposed to an artificial membrane outside of the body. Peritoneal dialysis (PD) is the term for the procedure where molecules are exchanged across the peritoneal membrane.[59]

TYPES OF DIALYSIS:

There are two types

1. Hemodialysis
2. Peritoneal dialysis

HEMODIALYSIS:

Haemodialysis is a method used to remove harmful metabolic waste and toxins from the body when the kidneys are no longer able to function properly [60]. The term "dialysis" is derived from the Greek word "dialusis," which means dissolution, with "dia" meaning through and "lusis" meaning loosening[61]. Healthy kidneys play a crucial role in maintaining the body's normal environment, including excreting waste products from metabolic processes and regulating water and electrolyte balance. They also produce hormones like erythropoietin, renin, thrombopoietin, and prostaglandins, which help regulate blood pressure and calcium levels. When kidneys fail due to disease, they can no longer perform these essential functions, leading to issues such as water and sodium retention, increased blood pressure, and decreased red blood cell production. Haemodialysis involves using a specialised filter or semi-permeable membrane to allow the blood to pass through, removing excess water, waste products, and toxins from the blood. This procedure cleanses the blood, restores the body's homeostatic balance, and helps regulate blood pressure by maintaining proper fluid and electrolyte levels [63]. Patients undergoing haemodialysis need to visit a dialysis centre regularly, typically every other day, with each session lasting several hours. While the choice of morning, afternoon, or evening sessions may vary based on patient availability and the healthcare team's schedule, the treatment is essential for individuals with kidney dysfunction to remove waste products and maintain their overall health.

Haemodialysis effectively replaces the kidney's filtration function in cases of renal failure, preventing the accumulation of toxic substances that could lead to serious health issues or even death [64]. While hemodialysis isn't a continuous process, it helps maintain the body's homeostasis by facilitating the removal of waste products through a simple diffusion process across a semi-permeable membrane [65]. Using a counter-current flow mechanism increases the effectiveness of dialysis and makes waste removal easier by generating a concentration gradient between the dialysate and blood [66].

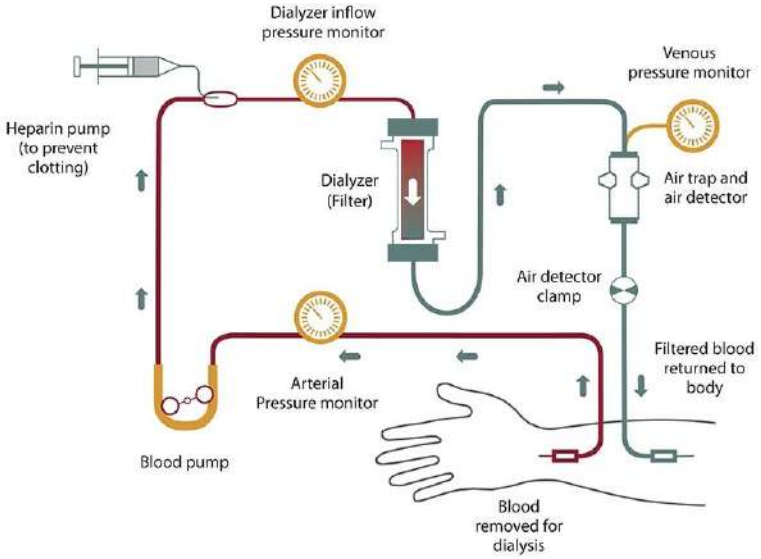

Fig no - 04: HEMODIALYSIS

PERITONEAL DIALYSIS:

Having a peritoneal cavity and functional PD access is the only requirement for beginning PD. There are different methods for inserting a peritoneal catheter. Open or laparoscopic surgical procedures, as well as percutaneous abdominal punctures performed by kidney specialists or interventional radiologists, can be used to get access to the peritoneal cavity. Better continuity of care and shorter wait times are key benefits of having a nephrologist place PD catheter. Additionally, the success rate is comparable to that of surgically implanted PD catheters [67,68,69]. After inserting the PD catheter, supine periodic PD can be started right away, preventing short-term HD. There are no further requirements for doing PD at home besides a spotless area of the house, a space the size of a closet to keep dialysis fluid, and a location for hand washing with clean running water. Elderly individuals may be able to benefit from home PD with the assistance of a qualified carer or home care nurse if they are unable to complete the several stages required for PD exchanges. If home care support is provided, Canadian data from the province of Ontario demonstrated improved eligibility for PD [70], and European research has verified the success of assisted PD for survival and peritonitis outcomes [70,71].

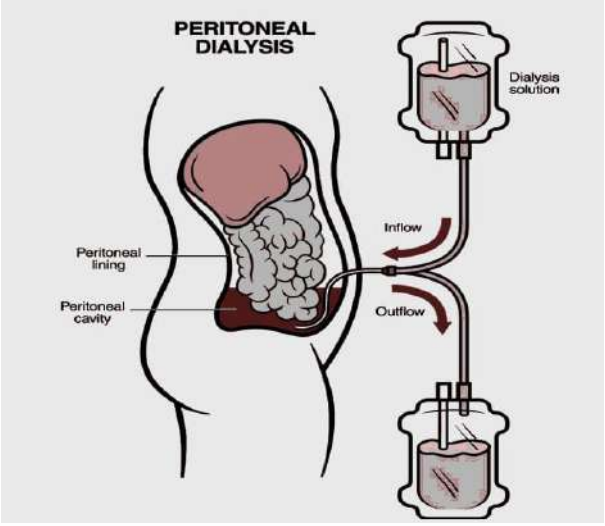

Fig no- 05: Peritoneal Dialysis

COMPLICATION AND CONTRAINDICATION

Infections and mechanical problems are less common with PD [72].therapy than with CRRT treatments. Compared to CRRT therapy, costs and equipment are lower [72,73]. Large mesenteric resections, cutaneous feeding tubes in situ (gastrostomies), known peritoneal defects or pleural communications (pleuroperitoneal shutdown), severe physical deformities, large abdominal hernias, and other conditions that should be evaluated at the bedside (such as obesity, multiple adhesions, documented type II ultrafiltration failure, active bowel ischemia, abdominal abscess, or in women in the third trimester of pregnancy) are contraindicated for PD [74].

Side Effects

Both types of dialysis come with side effects. It can also be hard to tell for sure whether a symptom is because of the dialysis or the kidney failure that is also affecting the body. Some of the most common side effects that people report include:

HEMODIALYSIS (HD)

- Blockage in your vascular access site (entrance point)
- Muscle cramps
- Hypotension (low blood pressure)
- Weakness, dizziness, or nausea
- Blood loss

PERITONEAL DIALYSIS

- Hernia (weakness in your abdomen muscle, often presenting as a lump or swollen area)
- Weight gain

Both (HD&PD)

- **Infection of the skin, blood, and/or peritoneum (belly area) –**

if left untreated, these can cause sepsis (a life-threatening condition leading to multiple organ failure).

- **Fatigue (feeling tired) –**

This can affect anyone but is usually more common for people who have been on dialysis for a long time. It is often hard to tell for sure if this is a side effect of the dialysis or a symptom of long-term kidney disease.

Pruritus- itchy skin that people with kidney disease may experience, especially in more advanced stages of CKD and people on dialysis. Like fatigue, it is often hard to tell for sure if this is a side effect of the dialysis or a symptom of long-term kidney disease[75].

INDIA DIALYSIS MARKET EXECUTIVE SUMMARY

The forecast for India's dialysis market anticipates substantial growth, projected to escalate from $2.113 billion in 2022 to $4.368 billion by 2030. This expansion represents a noteworthy Compound Annual Growth Rate (CAGR) of 9.50% spanning from 2022 to 2030. The market's upward trajectory is underpinned by several factors, including the rising incidence of chronic kidney disease (CKD), an expanding elderly populace, and heightened awareness regarding the advantages and accessibility of dialysis treatment. Key participants in India's dialysis market, such as Fresenius Medical Care, Baxter International, and Nipro Medical Corporation, wield significant influence due to their extensive range of dialysis products and services. Additionally, companies like DaVita, Narayana Health, and Apollo Hospitals contribute significantly to the market landscape. The Indian government has instituted various policies and regulations aimed at fostering the dialysis market's development. Initiatives like the National Dialysis Services Program aim to enhance dialysis access in underserved regions, while the National Health Policy endeavors to ensure universal healthcare access, including dialysis. Financial aid for dialysis treatment is also extended to patients through the National Health Mission. Private enterprises constitute a substantial presence in the market, with many offering dialysis services in rural areas and small towns. This expansion broadens the reach of dialysis services and contributes to making them more economically viable for a larger demographic. Overall, the Indian dialysis market is poised for continued substantial growth in the forthcoming years. Factors such as the increasing prevalence of CKD, a burgeoning elderly population, and heightened awareness regarding dialysis treatment's availability and advantages are anticipated to propel this growth trajectory. The prevalence of chronic kidney disease (CKD) is on the upsurge in India, primarily attributed to the escalating incidences of diabetes and hypertension, both of which are increasingly prevalent nationwide. Consequently, there has been a noticeable surge in the demand for dialysis treatment. As India's population ages, there is an anticipated rise in individuals suffering from kidney failure, further propelling the need for dialysis treatment. Moreover, there's a burgeoning awareness among the Indian populace regarding the availability and advantages of dialysis treatment, contributing significantly to the escalating demand for such services. The Indian government has actively implemented various policies and regulations, such as the National Dialysis Services Program, the National Health Policy, and financial aid through the National Health Mission, aiming to bolster the development of the dialysis market. Private enterprises play a pivotal role in India's dialysis market, with numerous companies extending their services to rural areas and small towns. This expansion not only broadens the accessibility of dialysis services but also makes them more economically feasible for a larger section of the populace. The inclination towards home-based dialysis is on the rise in India due to technological advancements and increasing awareness. This approach is gaining popularity owing to its convenience and cost-effectiveness compared to in-center dialysis.

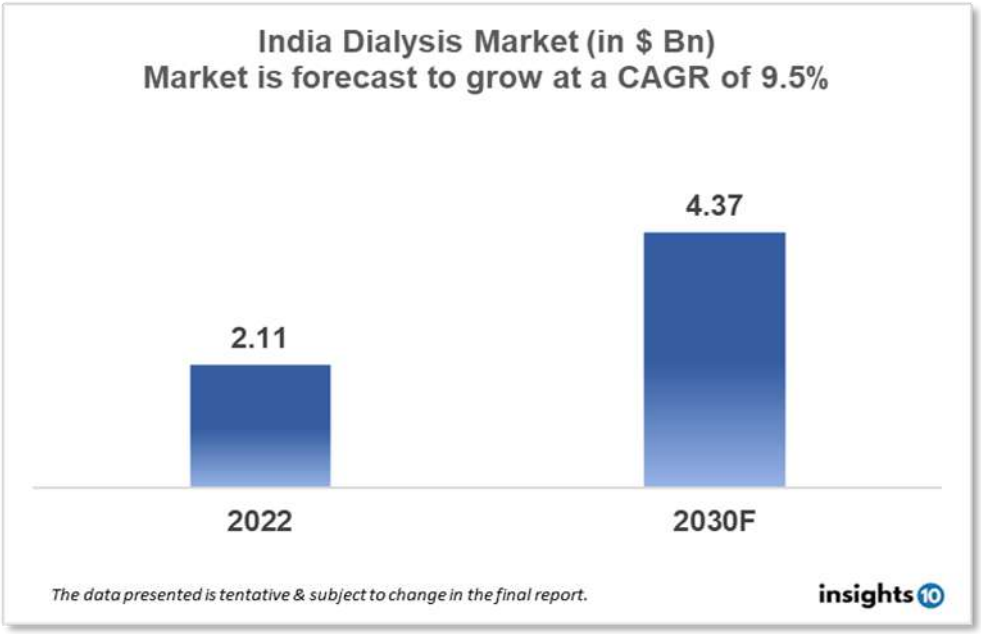

Fig no – 06

The escalating healthcare expenditure in the country is a significant driver for the growth of the dialysis market, further underscoring the increasing demand for these services.

LITERATURE REVIEW

- **Neelu Mathew et al., (2023)**

explore mental health and quality of life in chronic kidney disease (CKD) patients on various dialysis modalities. CKD patients on dialysis, whether hemodialysis (HD) or peritoneal dialysis (PD), tend to experience higher anxiety and depression compared to those on conservative management (CM). They also report lower quality of life, particularly in areas related to physical well-being and emotional health. PD patients have better anxiety and emotional well-being scores but face challenges in social functioning and physical comfort. This study highlights the impact of haemoglobin and serum albumin levels on mental health and quality of life, suggesting potential ways to mitigate these effects.

- **Yu Chen et al., (2023)**

investigated depression prevalence and associated factors in peritoneal dialysis patients. Among 132 continuous ambulatory peritoneal dialysis patients, 78.0% exhibited depressive symptoms, with 64.4% experiencing moderate/severe symptoms. Lower serum hemoglobin levels were independently associated with an increased risk of depression, as indicated by multivariable logistic regression analysis. In this study depression is highly prevalent in peritoneal dialysis patients, and low serum hemoglobin is a significant independent risk factor for depressive symptoms in this population.

- **Anshul Bhatnagar et al.,(2023)**

compared the costs of injectable dialysis drugs for privately insured patients undergoing peritoneal dialysis (PD) and in-centre hemodialysis in the United States between 2017 and 2020. They employed a retrospective cohort study and propensity matching to analyze patients based on various factors. The findings indicated that in-centre hemodialysis was associated with approximately twice the annual costs for injectable drugs compared to PD, but it also had lower non-drug dialysis-related expenses. The study suggests that initiating in-centre hemodialysis leads to higher injectable drug costs for privately insured patients, and increased utilization of PD might lead to reduced drug costs for this group. However, the study acknowledged limitations due to small

sample sizes affecting the ability to detect differences in certain cost categories.

- **Jose Emilio Sanchez et al., (2023)**

conducted a retrospective analysis to understand the impact of peritoneal dialysis (PD) treatments on patients with chronic kidney disease (CKD). Analysing data from 531 patients, the study categorised them based on PD technique and Icodextrin use. Key findings revealed a median technique survival time of around 19 months, with age and early peritoneal infections influencing technique survival. The study also highlighted the impact of age and early peritoneal infections on technique survival. In its results, the study concluded that specific PD strategies can improve patient survival, but older age and increased comorbidity may have adverse effects on patient outcomes. Early peritoneal infections significantly influence technique survival.

- **Jean-Blaise Wasserfallen et al. (2023)**

conducted a study in Western Switzerland and compared the quality of life (QOL) of chronic hemodialysis (HD) and peritoneal dialysis (PD) patients using the Euroqol-5D questionnaire. They found that both groups had similar QOL scores, with PD patients experiencing more limitations in their usual activities. Self-care had the highest scores, while usual activities had the lowest, with pain and discomfort affecting both groups and anxiety and depression significantly impacting PD patients. The study concluded that QOL was equally compromised in both groups, and addressing pain, discomfort, and anxiety/depression could enhance their QOL.

Patryk Barczuk et al. (2023) aimed to compare the impact of treatment options for chronic kidney disease (CKD) and end-stage kidney disease (ESRD), specifically hemodialysis in specialisedcentres versus peritoneal dialysis at home, on patients' quality of life. Peritoneal dialysis (PD) consistently outperformed hemodialysis (HD) in various aspects of quality of life, including physical health, social interactions, cognitive status, emotional well-being, physical functioning, pain relief, disease burden, daily life impact, symptom management, sexual function, financial aspects, and patient satisfaction. As a result, patients with stage 5 chronic kidney disease treated with PD reported superior health-related quality of life compared to those treated with HD, as assessed by the SF-36 and EQ-5D questionnaires.

- **Muhammad Affan Qaiser et al. (2023)**

aimed to compare gastrointestinal (GI) symptoms in end-stage renal disease (ESRD) patients undergoing peritoneal dialysis (PD) and hemodialysis (HD). A modified 15-item Gastrointestinal Symptom Rating Scale (GSRS) questionnaire was used to assess GI symptoms, including eating dysfunction. The study included 70 patients, with 35 on HD and 35 on PD. Both groups were similar in terms of sociodemographic factors. Overall, 68.5% of ESRD patients experienced GI symptoms (GSRS >1). Notably, a higher proportion of HD patients (80%) reported GSRS >1 compared to PD patients (57%). In the HD group, more patients experienced abdominal pain, constipation, and diarrhoea (74%, 60%, and 68.5%, respectively) compared to the PD group (34%, 28.5%, and 32%, respectively). The study concluded that GI symptoms vary in frequency, intensity, and variety among HD and PD patients.

MutluBankur et al., (2023) conducted a cross-sectional study in Turkey to compare the quality of life of end-stage renal disease (ESRD) patients undergoing different renal replacement therapies. Face-to-face interviews with 574 ESRD patients using the Kidney Disease Quality of Life scale revealed that overall quality of life, including physical and mental health components, was below average. Sub-dimensions related to kidney disease's impact and symptom management also scored relatively low, indicating reduced quality of life among dialysis patients. Home hemodialysis

stood out as superior across all dimensions, suggesting its advantages. The study recommended regulatory measures to promote home hemodialysis. The study contributes to the discussion on the best dialysis method for improved quality of life.

- **LiLiu et al.,(2023)**

examined the survival rates of ESRD patients receiving either hemodialysis (HD) or peritoneal dialysis (PD) in a matched-pair cohort. The study analysed data from 739 ESRD patients registered in the Chinese National Renal Data System between 2010 and 2018. The study identified risk factors for poorer survival, including age at dialysis initiation, congestive heart failure, cerebrovascular disease, and the Charlson Comorbidity Index (CCI). Notably, in subgroup analysis, PD demonstrated significantly higher survival rates than HD in diabetic ESRD patients. As a result, while there was no significant difference in the overall survival of ESRD patients between HD and PD, PD showed superior survival outcomes in diabetic ESRD patients.

- **AbiFaraj et al.,(2023**)

Investigate the adjustments made to peritoneal dialysis (PD) practices in response to the COVID-19 pandemic in the United States, with a focus on understanding the patient perspective. The study, conducted through a survey of PD patients in academic-affiliated home dialysis units, found that most patients did not need to modify their home setups or face significant issues with supply delivery during the pandemic. Patients felt comfortable visiting the dialysis unit when necessary, and they expressed high satisfaction with staff support while showing minimal signs of depression or anxiety. In terms of results, the pandemic-related adjustments effectively addressed challenges for PD patients, resulting in overall contentment with the quality of care and minimal reported anxiety or depression.

Jeong-HoonLimetet al.,(2023) discuss the rising incidence of end-stage kidney disease (ESKD) around the world and how it has a substantial impact on patient mortality, particularly in the initial stages of starting dialysis. Several risk factors associated with higher early mortality are mentioned, including old age, anemia, co-morbid cardiovascular disease, and malnutrition. Early referral to nephrologists for patients with chronic kidney disease (CKD) is highlighted as a potential modifiable factor that can reduce early mortality. The study evaluates the effect of planned dialysis on patient survival after dialysis initiation, taking into consideration different dialysis modalities (hemodialysis and peritoneal dialysis). The results indicate that planned dialysis offers survival benefits during the early dialysis period, particularly in patients undergoing hemodialysis, and these benefits last up to two years after dialysis initiation. The study emphasizes the importance of educating patients with CKD about the advantages of planned dialysis and addressing barriers to its implementation.

- **Alireza Kalantarieet al.,(2023)**

conducted a cross-sectional study in Iran to compare the quality of life of hemodialysis and peritoneal dialysis patients using the KDQOL-SFTM questionnaire. The study involved 84 hemodialysis and 31 peritoneal dialysis patients. Results showed that peritoneal dialysis patients generally had a better quality of life compared to hemodialysis patients, with significant differences in specific dimensions related to the impact of kidney disease and general dimensions related to pain. The study recommended that physicians and nurses should encourage patients to consider peritoneal dialysis methods due to the observed better quality of life in peritoneal dialysis patients.

- **BorheneMejri et al.,(2023)**

conducted a cross-sectional study in Tunis focused on assessing the health-related quality of life (HRQOL) of hemodialysis patients using the

KDQOLTM-36 survey. They recruited 65 patients from a single hemodialysis center and found that the overall HRQOL was low. Factors affecting HRQOL included diabetes, cardiovascular disease, age, weight gain between dialysis sessions, hyponatremia, hypoalbuminemia, and a dilated left cavity in transthoracic ultrasound. Significant correlations were observed between these factors and various aspects of HRQOL, such as symptoms, effects, and burden of kidney disease. The study highlights the challenges faced by hemodialysis patients in Tunisia and suggests the need for further research with a larger sample size to better understand and address these issues.

Davide Marturano et al.,(2023)discuss the impact of psychological support on patients undergoing renal replacement treatment, including hemodialysis and peritoneal dialysis. The study included 24 patients and aimed to assess anxiety levels and the effectiveness of psychological support. Key findings include a significant reduction in both trait and state anxiety after psychological support in both patient groups. Notably, patients on peritoneal dialysis experienced a more significant decrease in state anxiety. The mode of delivery (in-person or online) did not significantly influence the results. Overall, psychological support was found to enhance patients' ability to cope with the challenges of chronic kidney disease and improve treatment compliance, potentially benefiting the doctor-patient relationship.

- **Eleni Marki et al.,(2023)**

focus on patients undergoing peritoneal dialysis for end-stage renal disease (ESRD) in Greece. It aimed to understand their body image, quality of life, and emotional intelligence. The study collected 102 completed questionnaires from these patients. The findings revealed that participants had a moderate degree of body-image dysphoria, moderate levels of emotional intelligence, and experienced a moderate quality of life. Some notable correlations were found, such as women reporting worse body image and university graduates exhibiting higher emotionality. Marital status, education level, occupation, and place of residence also influenced specific aspects of quality of life. In Results ESRD patients on peritoneal dialysis face limitations related to their condition and treatment. The study recommended that improving emotional intelligence plays a vital role in enhancing both body image and quality of life for these patients.

- **Ipek Turk et al.,(2023)**

explore the relationship between health-related quality of life (HRQOL) and the treatment outcomes of end-stage renal disease (ESRD) patients, particularly those receiving hemodialysis (HD) or peritoneal dialysis (PD). It investigates a range of factors influencing the HRQOL in these patients, including clinical, psychological, socioeconomic, and demographic factors, as well as laboratory parameters.Key findings include differences in HRQOL between HD and PD patients, with PD patients scoring higher in specific domains of the KDQOL-SF 1.3 questionnaire. Correlations were also observed between HRQOL and demographic, clinical, and laboratory factors, including age, co-morbidity, and hospitalization history. At last, this study underscores the intricate relationship between HRQOL and ESRD treatment methods, emphasizing the need to consider a multitude of factors when evaluating the quality of life of these patients.

- **Yi-Che Lee et al.,(2023)**

investigates the standardised mortality ratios (SMRs) in hemodialysis (HD) and peritoneal dialysis (PD) patients, focusing on gender and age-specific SMRs. Among male HD patients, 61.2% experienced mortality, mainly due to genitourinary system diseases, circulatory system diseases, and endocrine/metabolic disorders, resulting in an SMR of 4.75. Male HD patients exhibited varying

SMRs for different causes, such as neoplasms with an SMR of 1.97 and endocrine/metabolic disorders with an SMR of 14.23. Similarly, female HD patients had a 60.5% mortality rate, primarily attributed to genitourinary system diseases, endocrine/metabolic disorders, and circulatory system diseases, leading to an SMR of 5.61. The study also examined age-specific SMRs for both PD and HD patients, revealing variations by age groups.Thisstudy emphasises the importance of addressing these specific mortality factors, particularly in the clinical care of dialysis patients.

- **PimBouwmans et al., (2023**)

compared the mental health of dialysis patients (ICHD and PD) during the COVID-19 pandemic using data from the Dutch DOMESTICO study spanning from March 2020 to August 2021. They found that before the pandemic, both groups had similar mental quality of life scores, but ICHD patients reported more nervousness and sadness. During the pandemic, overall mental quality of life scores remained similar, but ICHD patients reported higher levels of nervousness, irritability, anxiety, and sadness during specific periods. Multivariable regression analysis confirmed these differences. This study concludes that ICHD patients experienced more specific mental symptoms, especially during the second COVID-19 lockdown, with no significant decline in their overall mental quality of life.

- **Phuong Que Tran et al., (2021)**

aimed to identify the factors affecting the quality of life (QoL) of end-stage renal disease (ESRD) patients undergoing dialysis in a Vietnamese national hospital. The majority of the 178 patients were on .hemodialysis (HD), with a smaller group undergoing peritoneal dialysis (PD). Notably, patients with PD had higher average QoL scores than those with HD, while older age and the presence of peptic ulcer disease were associated with lower QoL scores. The study recommended that peritoneal dialysis may offer advantages for maintaining dialysis, particularly in terms of QoL. As a result, the research underscores the need to enhance the quality of life of dialysis patients, with a focus on elderly individuals and those with peptic ulcer disease, and highlights the potential benefits of peritoneal dialysis in this context.

- **Seon-Mi Kim et al., (2020)**

focused on the nutritional factors affecting mortality and morbidity in dialysis patients, particularly protein-energy wasting. It aimed to compare the dietary behaviour, nutrient intake, and nutritional status of hemodialysis (HD) and peritoneal dialysis (PD) patients. The results showed that HD patients were older on average, and in dietary behaviour patterns, they exhibited more appropriate practices than PD patients. The dietary intake analysis indicated that PD patients had lower energy intake due to reduced carbohydrates, fat, and protein consumption. Moreover, HD patients had higher nutrient intake compared to the recommended allowance and exhibited higher serum albumin and potassium levels. In summary, the study revealed that prevalent PD patients had poorer dietary behaviour and nutritional intake than HD patients.

- **Lucas G. Da Luz et al.,(2020)**

examine the peritoneal dialysis (PD) and its impact on patient outcomes, with a particular focus on technique failure (TF). While PD offers advantages such as preserving residual renal function (RRF), especially in non-diabetic patients, it also raises concerns about higher TF rates compared to hemodialysis (HD). The study explores the implications of peritonitis, PD fluid choice, and peritoneal membrane status on TF. It discusses potential biomarkers for predicting TF and recommends strategies like multidisciplinary teams and risk assessment tools to reduce TF rates. Overall, the study underscores the importance of targeting modifiable risk factors to improve outcomes in PD patients. This comprehensive analysis contributes valuable insights into the

intricacies of PD and its impact on patient well-being, providing a holistic understanding of the subject matter.

- **RamapriyaSinnakirouchenanet al.,(2011)**

started comparing the health-related quality of life (HRQOL) and treatment outcomes in patients with chronic kidney disease (CKD) and end-stage renal disease (ESRD), with a focus on hemodialysis (HD) and peritoneal dialysis (PD).It emphasizes the significance of selecting a modality based on elements such as patient preferences, physician preferences, education, and reimbursement issues. The evaluation notes that limited patient education can make it difficult for patients to make informed decisions, even while it advocates for patient choice as the main factor in choosing a treatment modality. The study primary findings include that PD patients initially have a survival advantage, but that advantage wanes after one to two years and that subsequent outcomes depend on co-morbidities and age. Higher mortality and morbidity rates have been linked to the use of central venous catheters (CVC) for HD access.

AIM & OBJECTIVE

AIM:

To Assess the Benefits, Risks, Cost effective analysis & evaluating the Psychological issues in Peritoneal dialysis and Haemodialysis.

OBJECTIVE:

The main objective of this study is :

- Assessment of benefits of each Individual patients.
- Evaluation of the risk for each individual patient.
- To assess the cost effectiveness in dialysis method.
- Evaluationof Psychological symptoms.

METHODOLOGY DETAILS

- Site of study
- Source of data
- Study design
- Patient selection
- Work methodology

STUDY SITE

This Interview is being carried out at Kidney dialysis center, Hospitals, Home located in and around Namakkal & Erode district.

SOURCE OF DATA

All relevant information were collected from

- Patient's records in Dialysis center
- Verbal communications with patients and Care-Giver
- Patients behaviour
- Patient counselling
- Medication history interview
- Past & Present Medical History

STUDY DESIGN

- Gender wise Categorization
- Age wise Categorization
- Types of Dialysis
- Educational Status
- Family Medical History
- Co – morbidities
- Frequency of Dialysis procedure (per month)
- Psychological Tool (Psychosocial Adjustment to Illness Scale – Self Reported)
- Study site
- Monthly Expenditure

PATIENT SELECTION CRITERIA

INCLUSION CRITERIA:

- Both genders
- Age between 35 to 80 years
- Chronic renal failure
- Any other chronic disease condition
- Willing to sign informed consent form
- EXCLUSION CRITERIA:
- Under the age of 18 years
- Pregnancy or Nursing Mothers
- Unable to provide accurate answers

WORK METHODOLOGY

- This Retrospective –cohort study will involve administration of interview to a sample of participants at Kidney Dialysis center, Home, Hospitals.
- Participation is voluntary, and all patients give informed consent.
- A standardised questionnaire is utilized to the collection of data.
- Answers is recorded in multiple formats according to patients responses.
- The records are note on questions patterns and keep on safe file.
- The relevant things is documented based on the literature.

RESULTS AND DISCUSSIONS

Table no- 01: Gender wise Categorization of Hemodialysis Patients (n=25)

Gender	No. of Patients	Percentage %
Male	17	68%
Female	8	32%

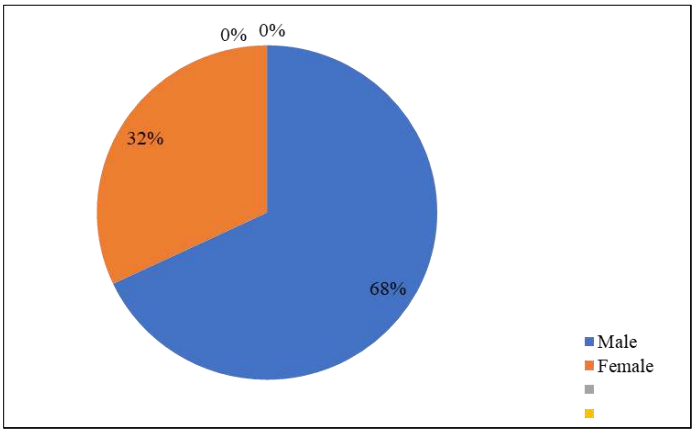

Fig no- 07:Categorization of hemodialysis patients by gender (n=25)

Out of the selected 25 patients, 17 patients (68%) were males, 8 patients (32%) were females.

Table no- 02: Gender wise Categorization of Peritoneal dialysis Patients

Gender	No. of Patients	Percentage %
Male	18	72%
Female	7	28%

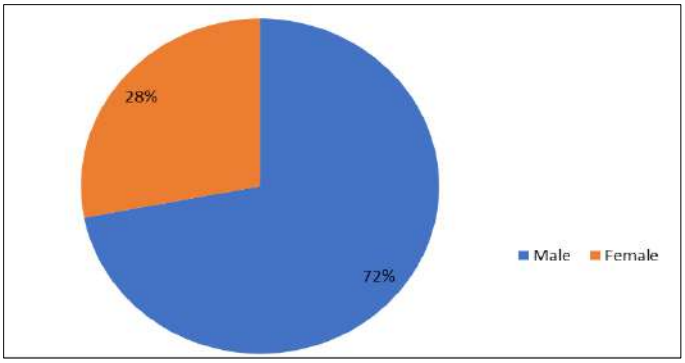

Fig no- 06:Categorization of peritoneal dialysis patients by gender (n=25)

Out of the selected 25 patients, 18 patients (72%) were Males, 7 patients (28%) were Females.

Table no- 03: Age wise categorization of hemodialysis patients (n= 25)

Age in Years	No. of Patients	Percentage %
35-45	01	4%
46-55	10	40%
56-65	14	56%
66-75	0	0%

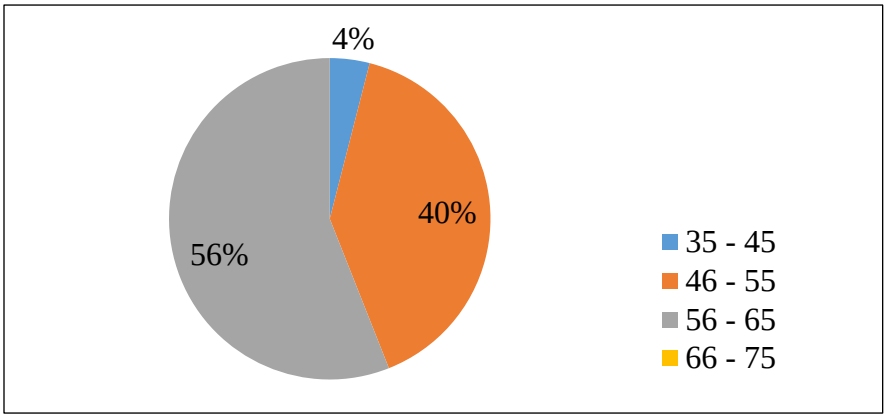

Fig no- 07: Categorization of Patients in Hemodialysis patients by Age (n=25) .

Out of the selected 25 patients, 1 patient was in the age group of 35 to 45, 10 Patients were in age group of 46 to 55, and 14 patients were in age group of 56 to 65.

Table no- 04: Age wise categorization of peritoneal dialysis patient (n= 25)

Age in Years	No. of Patients	Percentage %
36-45	0	0%
46-55	8	32%
56-65	13	52%
66-75	4	16%

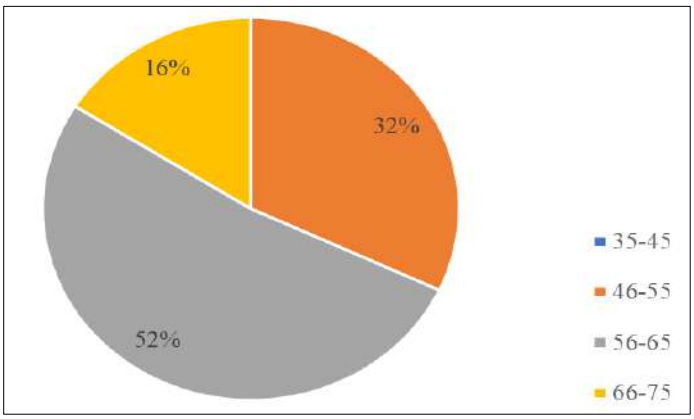

Fig no- 08:Categorization of Peritoneal dialysis Patients by Age (n=25)

Out of the selected 25 patients, No patients were in the age group 35 to 45, 8 Patients were in the age group of 46 to 55, 13patients were in the age group of 56 to 65, 4 patients were in the age group of 66 to 75.

Table no- 05: Educational status wise Categorization of Hemodialysis Patients (n= 25)

Educational Status	No. of Patients	Percentage
Uneducated	21	84%
educated	4	16%

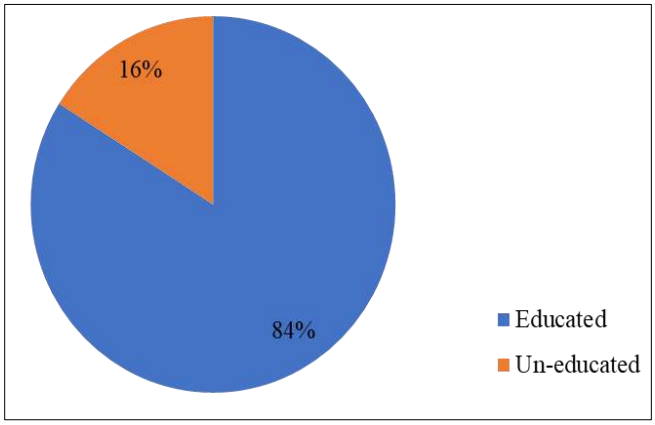

Table no- 06: Educational status wise Categorization of Peritoneal dialysis Patients (n= 25)

Educational Status	No. of Patients	Percentage %
Uneducated	9	36%
Educated	16	64%

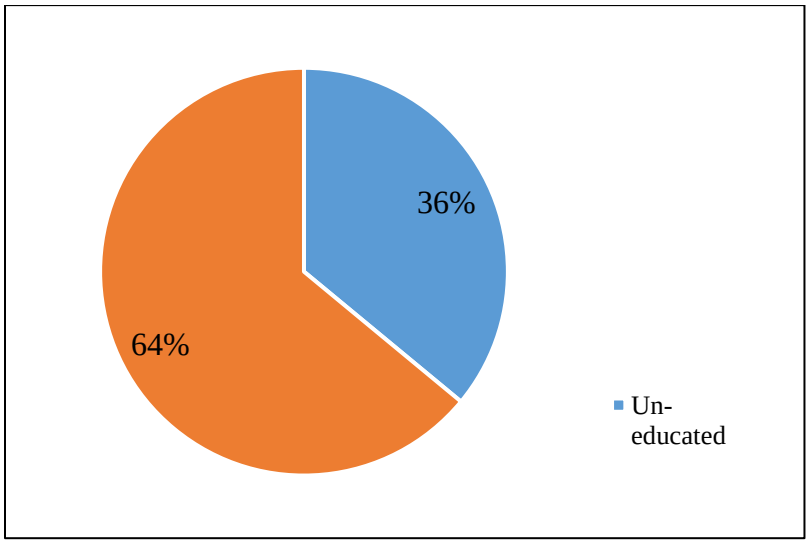

Fig no- 10:Categorization of Peritoneal dialysis Patients by educational status

Out of the selected 25 patients, 9 patients were un-educated, 16 patients were educated.

Table no- 07: Co-morbidities wise Categorization of Hemodialysis Patients (n=25)

Co-Morbidities	No. of Patients	Percentage %
Diabetes mellitus Only	5	20%

Hypertension only	4	16%
	0	0%
Hypothyroidism	16	64%

Co-Morbidities	No. Of Patients	Percentage %
Diabetes mellitus Only	0	0%
Hypertension only	1	4%
	1	4%
Hypothyroidism	23	92%

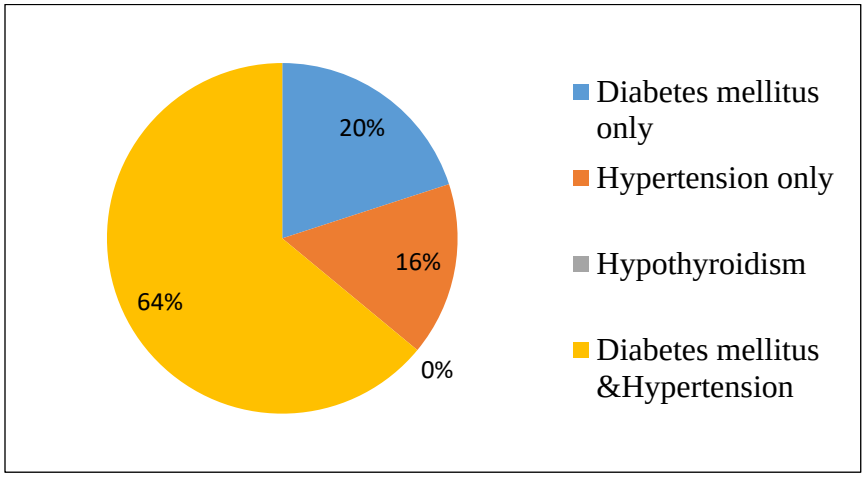

Fig no- 11:Categorization of Hemodialysis Patients by Comorbidities (n=25)

Out of the selected 25 patients, 5 patients have Diabetes mellitus only, 4 patients have Hypertension only, No patients have Hypothyroidism and 16 patients have Both Diabetes mellitus & Hypertension

Table no- 08: Co-morbidities wise Categorization of Peritoneal dialysis Patients(n=25)

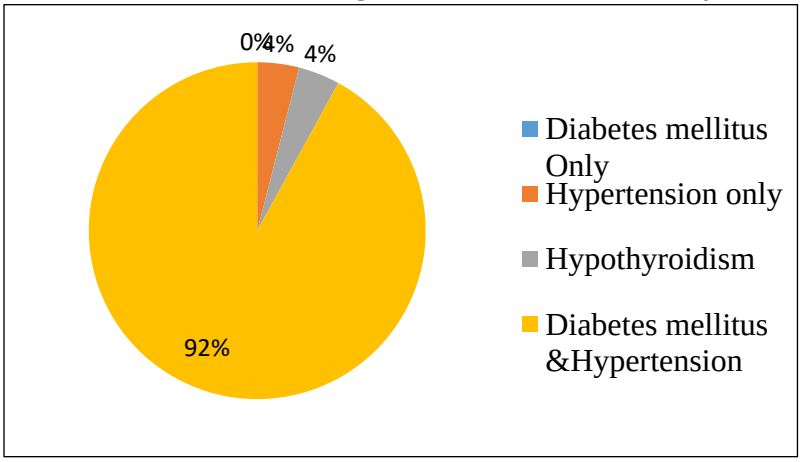

Fig no- 12:Categorization of Peritoneal dialysis Patients by Comorbidities (n=25)Out of the selected 25 patients, No patients have Diabetes mellitus only, 1 patient have Hypertension only, 1 patient have Hypothyroidism and 23 patients have Both Diabetes mellitus & Hypertension.

Table no- 09: Employment status wise Categorization of Hemodialysis patients (n= 25)

Employment Status	No. of Patients	Percentage (%)
Employer	14	56%
Un-employer	11	44%

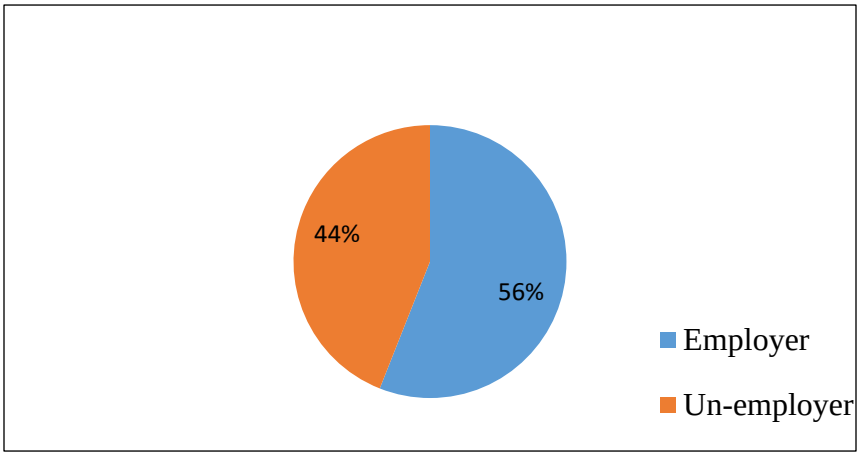

Fig no- 13:Categorization of Hemodialysis patients by Employment status

Out of the selected 25 patients, 14 patients were employed, 11 patients were unemployed.

Table no- 10: Employment status wise Categorization of Peritoneal dialysis patients (n=25)

Employment Status	No. of Patients	Percentage (%)
Employer	16	64%
Un-employer	09	36%

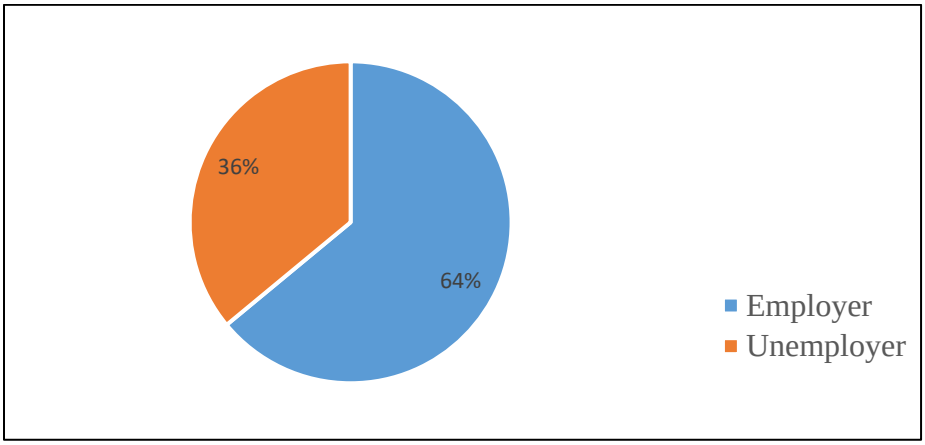

Fig no- 14:Categorization of Peritoneal dialysis patients by Employment status

Out of the selected 25 patients, 16 patients were employed, 09 patients were unemployed.

Table no- 11: Monthly income wise categorization of hemodialysis patients (n= 25)

Income In Rupees	No. of Patients	Percentage (%)
10,000 to 30,000	6	24%
31,000 to 60,000	6	24%
61,000 to 1,00,000	7	28%
Above 1,00,000	6	24%

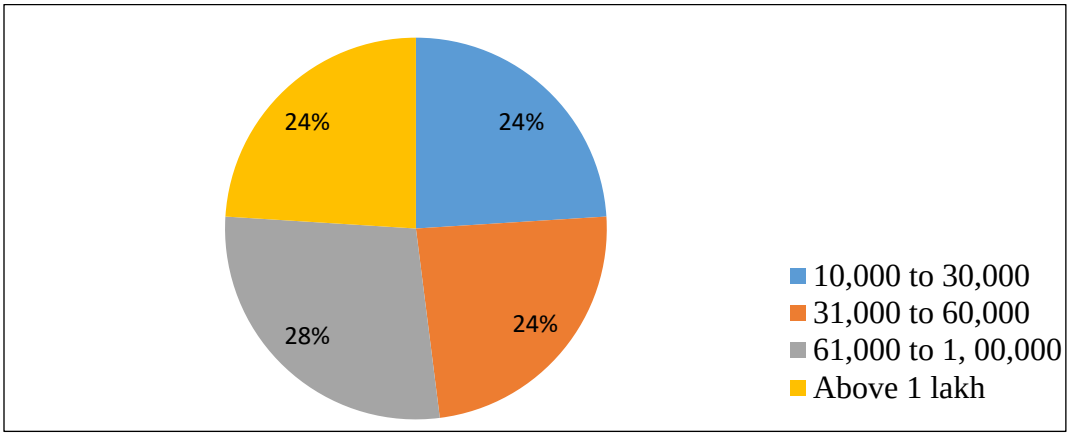

Fig no- 15:Categorization of Hemodialysis Patients by Monthly income (n= 25)

Out of the selected 25 patients, 6 patients had a monthly income of 10,000 to 30,000, 6 patients had a monthly income of 31,000 to 60,000, 7 patients had a monthly income of 61,000 to 1,00,000, and 6 patients had a monthly income of above one lakh.

Table no- 12: Monthly income wise categorization of peritoneal patients(n= 25)

Income in Rupees	No. of Patients	Percentage (%)
10,000 to 30,000	0	0%
31,000 to 60,000	02	8%
61,000 to 1,00,000	11	44%
Above 1,00,000	12	48%

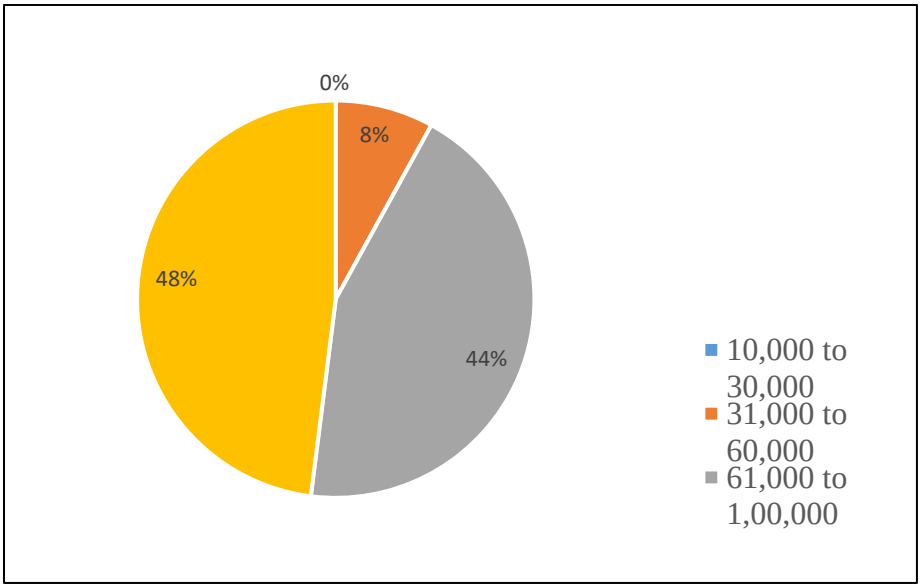

Fig no- 16:Categorization of Peritoneal Patients by Monthly income (n= 25)

Out of the selected 25 patients, 2 patients had a monthly income of 31,000 to 50,000 rupees, 11 patients had a monthly income of 50,000 to 1, 00,000 rupees, and 12 patients had a monthly income of above one lakh.

Table no- 13: Proper Diet Habits Categorization of Hemodialysis Patients (n= 25)

Are They following Proper Diet?	No Of Patients	Percentage %
YES	24	96%
NO	1	4%

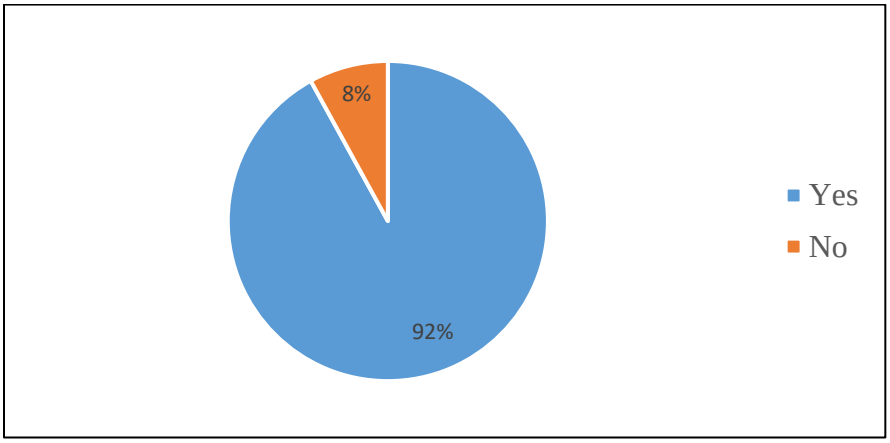

Fig no- 17:Categorization of Hemodialysis Patients by following the proper diet

Out of the selected 25 patients, 24 patients were following proper diet, 1 patients were not following proper diet.

Table no- 14: Proper Diet Habits Categorization of Peritoneal dialysis Patients (n= 25)

Are They following Proper Diet?	No Of Patients	Percentage (%)
Yes	22	88 %
No	3	12 %

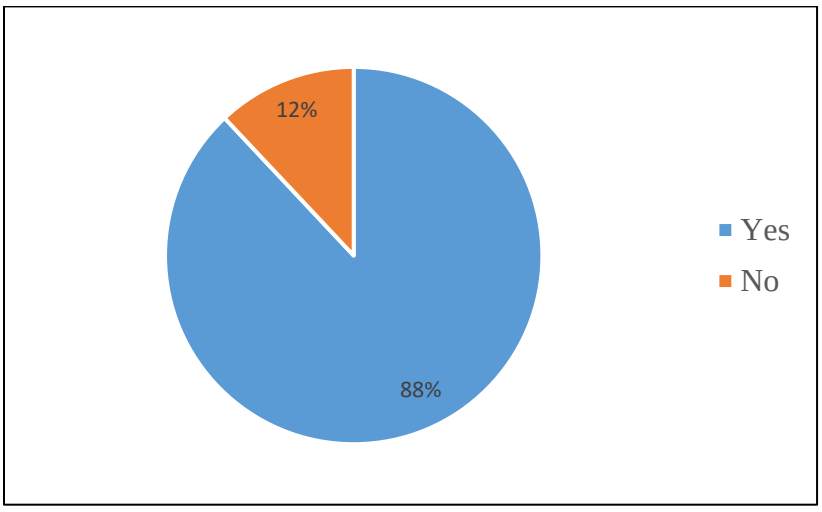

Fig no- 18: Categorization of Peritoneal dialysis Patients by following proper diet

Out of the selected 25 patients, 22 patients were following proper diet, 3 patients were not following proper diet

Table no- 15: Other system of medicine usage wise Categorization of Hemodialysis Patients (n=25)

Following Any Other System Of Medicine	No. Of Patients	Percentage (%)
Yes	4	15 %
No	21	84 %

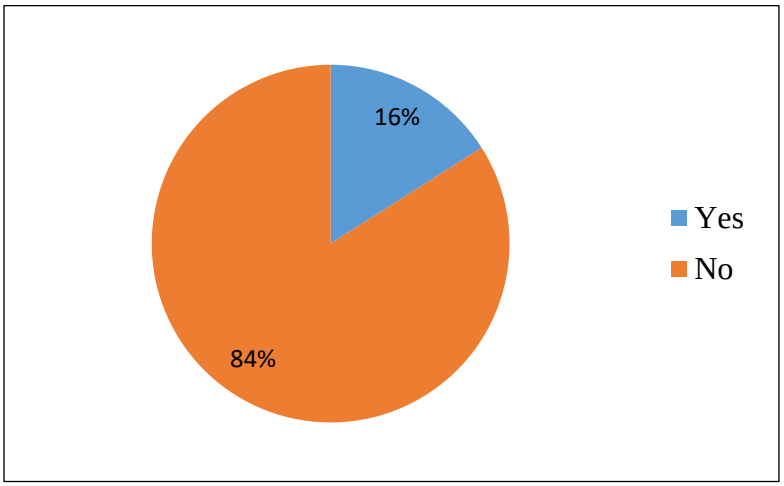

Fig no- 19:Categorization of Hemodialysis patients by following any other system of medicine

Out of the selected 25 patients, 4 patients were following the other system of medicine, 21 patients were not following the other system of medicine

Table no- 16: Other system of medicine usage wise Categorization of Peritoneal dialysis Patients (n= 25)

Following Any Other System Of Medicine	No. Of Patients	Percentage (%)
Yes	23	92%
No	02	8%

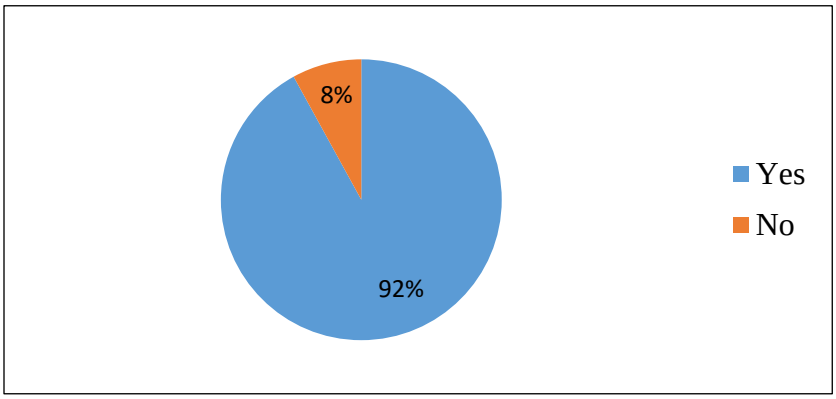

Fig no- 20:Categorization of Peritoneal dialysis Patients by following any other system of medicine

Out of the selected 25 patients, 10 patients were following the other system of medicine, 15 patients were not following the other system of medicine.

Table no- 17: Dialysis center wise Categorization of Hemodialysis patients (n= 25)

Dialysis	No. of Patients	Percentage (%)
Government Center	8	32%
Privaye Hospital	17	68%

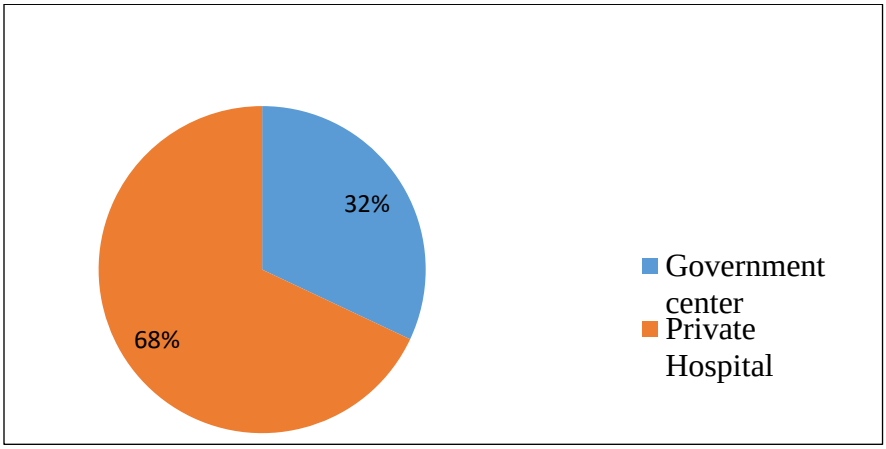

Fig no- 21:Categorization of hemodialysis Patients by Center for dialysis

Out of the selected 25 patients, 8 patients were going to Government center, 17 patients were going to private center.

Table no- 18: Dialysis center wise Categorization of Peritoneal dialysis Patients (n=25)

Dialysis Center	No. of Patients	Percentage (%)
Government Center	0	0%
Private Hospital	25	100%

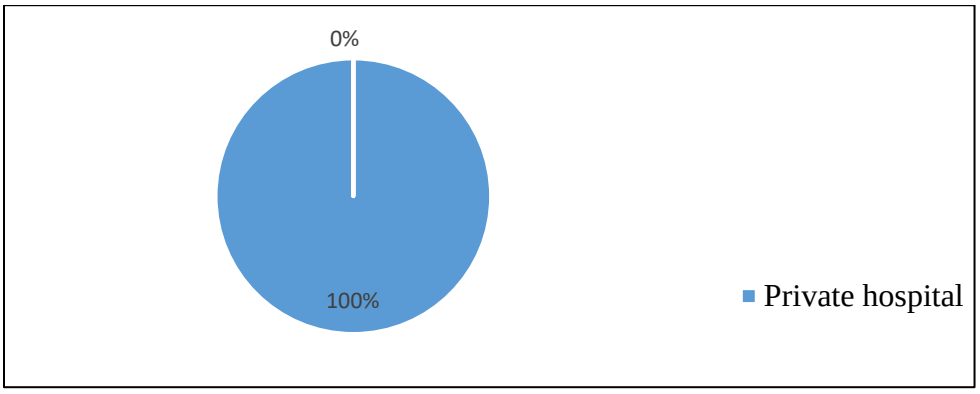

Fig no- 22:Categorization of Peritoneal dialysis Patients by center for dialysis (n=25)

Out of the selected 25 patients, All patients were follows private sector for Peritoneal dialysis.

Table no- 19: Looking for kidney transplantation wise Categorizations of Hemodialysis Patients (n= 25)

Are you Looking for Kindly Transplantation	No. of Patients	Percentage (%)
Yes	6	24%
No	19	76%

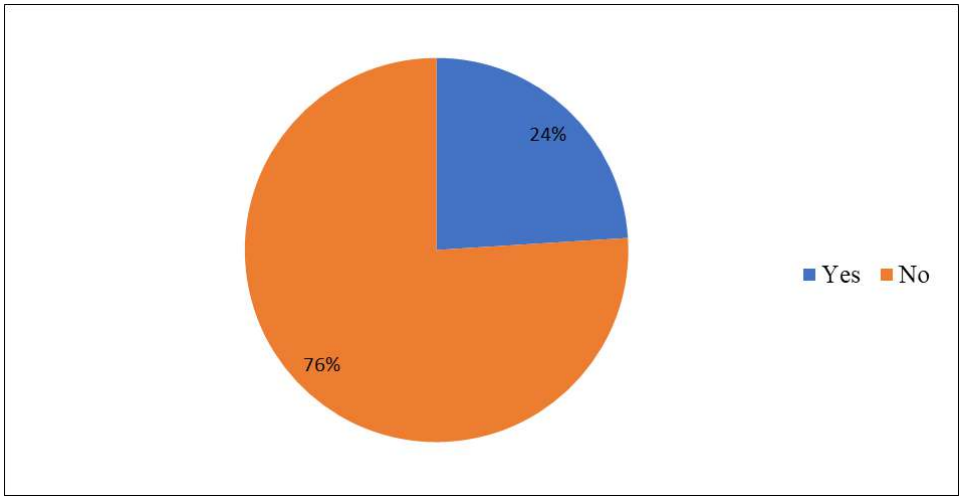

Fig no- 23:Categorization of Hemodialysis Patients by looking for kidney transplantation

Out of the selected 25 patients, 6 patients were looking for kidney transplantation and 19 patients were not looking for kidney transplantation.

Table no- 20: Looking for kidney transplantation wise Categorization of Peritoneal dialysis Patients (n=25)

Are you looking for kindney Transplantation	No. of Patients	Percentage (%)
Yes	08	32%
No	17	68%

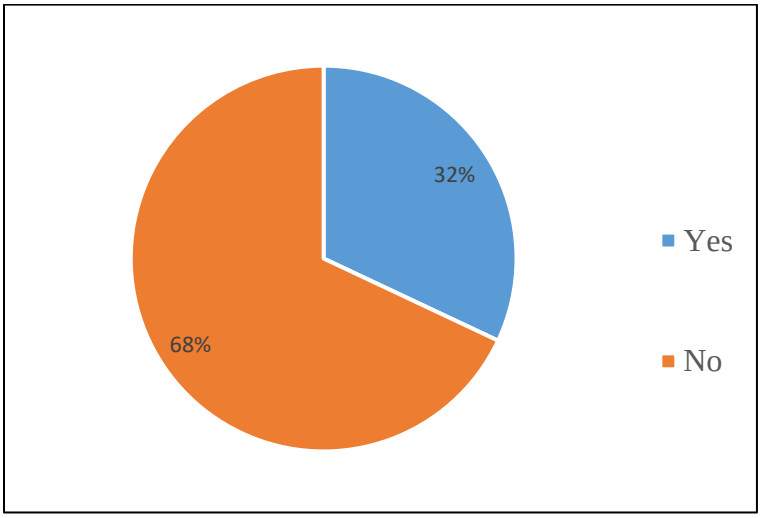

Fig no- 24:Categorization of Peritoneal dialysis Patients by looking for kidney transplantation

Out of the selected 25 patients, 08 patients were looking for kidney transplantation, and 17 patients were not looking for kidney transplantation.

Table no- 21: Psychological scale value wise Categorization of Hemodialysis Patients (n= 25)

Psychological Scale Value	No. of Patients	Percentage (%)
1 – 10	0	0 %
11 – 16	4	16%
17 – 20	9	36%

21 – 30	12	48%
31 – 40	0	0%

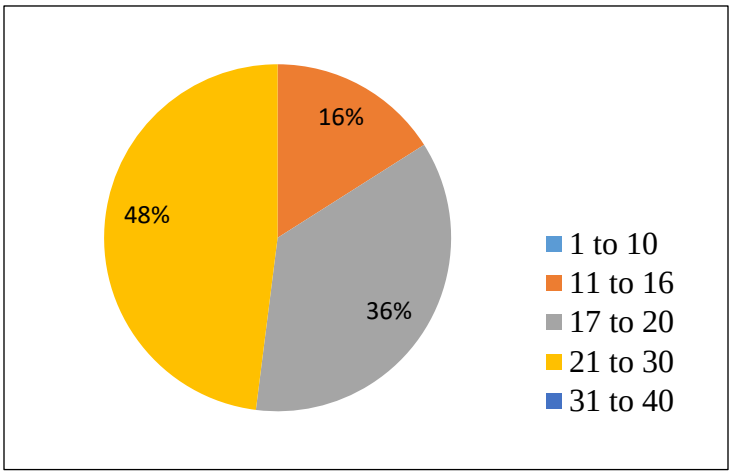

Fig no- 25:Categorization of Hemodialysis patients by Psychological scale value (n=25)

Out of the selected 25 patients, no patients have value (1–10), 4 patients have value (11–16), 9 patients have value (17–20), 12 patients have value (21–30), and no patients have value (31–40).

Table no- 22: Psychological scale value wise Categorization of Peritoneal Patients (n= 25)

Psychological Scale Value	No. Of Patients	Percentage (%)
1 – 10	3	12%
11 – 16	2	8%
17 – 20	4	16%
21 – 30	10	40%
31 – 40	6	24%

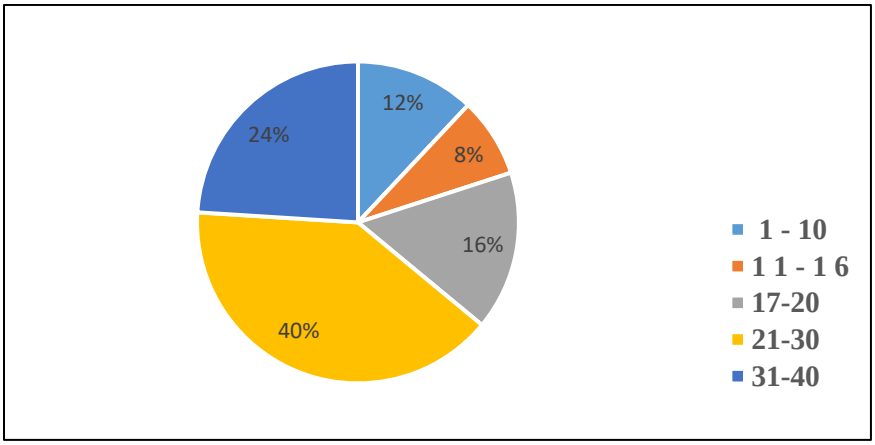

Fig no- 26:Categorization of Peritoneal Dialysis patients by Psychological scale value (n=25)

Out of the selected 25 patients, 3 patients had a value of 1–10, 2 patients had a value of 11–16, 4 patients had a value of 17–20, 10 patients had a value of 21–30, and 6 patients had a value of 31–40 or above.

Table no- 23: Psychological Issues wise Categorization of Hemodialysis Patients (n= 25)

Psychological Issues	No. of Patients	Percentage (%)
Normal	0	0%
Mild Depression	04	16%

Borderline Depression	09	36%
Moderate Depression	12	48%
Severe Depression	0	0%

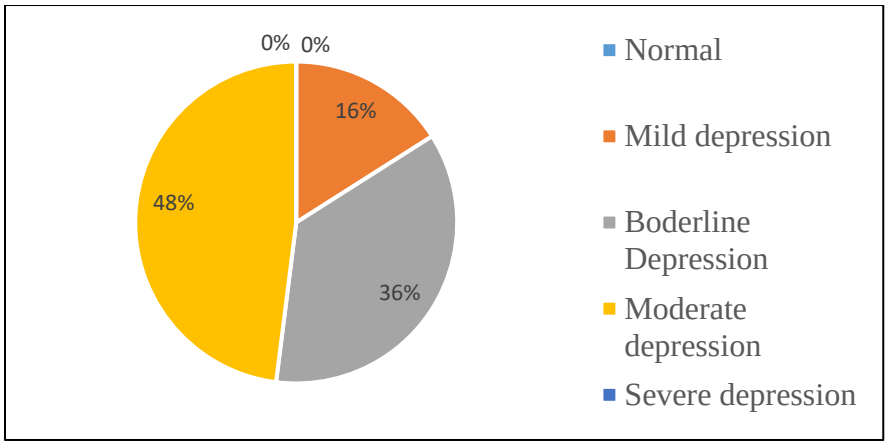

Fig no- 27:Categorization of the Hemodialysis patients by Psychological issues (n=25)

Out of the selected 25 patients, 4 patients have mild depression, 9 patients have borderline depression, and 12 patients have moderate depression. No patients have severe depression.

Table no- 24: Psychological Issues wise Categorization of Peritoneal dialysis Patients (n= 25)

Psychological Issues	No. of Patients	Percentage (%)
Normal	03	12%
Mild Depression	02	8%
Borderline Depression	04	16%
Moderate Depression	10	40%
Severe Depression	06	24%

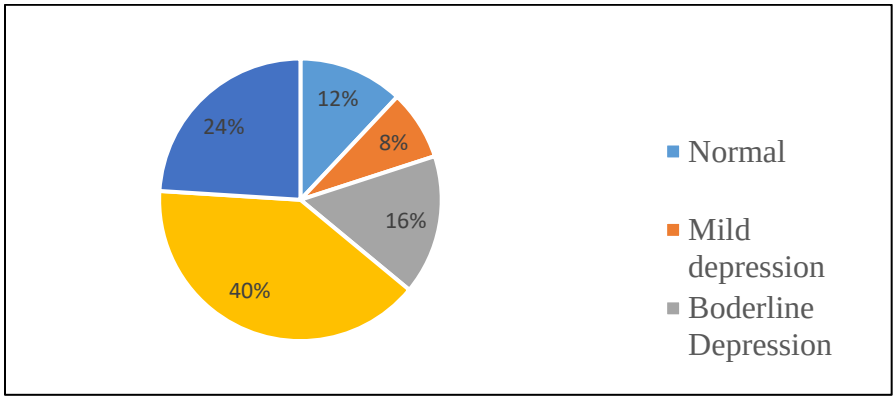

Fig no- 28:Categorization of the Peritoneal dialysis patients by Psychological issues (n=25)

Out of the 25 patients selected, 3 have no issues, 2 have mild depression, 4 have borderline depression, and 10 have moderate depression. Six patients have severe depressio

CONCLUSION

The collected data from both hemodialysis and peritoneal dialysis cases among 25 patients presents several significant insights. In the hemodialysis group, the majority were males (68%) compared to females (32%), whereas in peritoneal dialysis, a higher male representation (72%) was observed. Age distribution in hemodialysis showed a predominant presence in the 56-65 age bracket, while peritoneal dialysis depicted a broader range from 46-75, suggesting diverse age profiles in this modality. Educational

backgrounds showcased a significant difference between the two groups, with a higher proportion of educated patients in peritoneal dialysis compared to hemodialysis. Additionally, the prevalence of comorbid conditions varied, with a higher prevalence of both Diabetes mellitus and Hypertension in peritoneal dialysis. Employment status, income distribution, dietary adherence, medical treatment preferences, and interest in kidney transplantation differed notably between hemodialysis and peritoneal dialysis groups. Hemodialysis patients tended to favor private centers, while peritoneal dialysis patients predominantly followed private sector treatments. Moreover, perceptions of depression levels revealed distinctions between the two groups, with varying degrees of severity between hemodialysis and peritoneal dialysis patients. These findings underscore the importance of personalized care approaches in dialysis treatment, acknowledging the multifaceted factors that impact patients' lives. Tailored interventions considering gender, age, education, socioeconomic status, medical conditions, psychological well-being, and treatment preferences are crucial for optimizing the outcomes and quality of life for individuals undergoing dialysis. Such nuanced insights gleaned from this analysis can contribute significantly to enhancing patient-centric care and improving the overall management of chronic kidney disease through targeted interventions and support strategies. Further studies with larger sample sizes can offer deeper insights into these differences, aiding in the development of more targeted and effective patient care protocols in the realm of dialysis therapies.

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