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A Prospective Observational Study On Prescription Pattern Of Antihypertensive Drug And Assessment Of Medication Adherence In Patients Undergoing Hemodialysis-A Pilot Study

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ABSTRACT BACKGROUND:

This prospective observational pilot study was conducted in hypertensive chronic kidney disease patients undergoing maintenance hemodialysis. The study aimed to evaluate and analyze the prescribing pattern of antihypertensive and to assess medication adherence using the Adherence to Refill and Medication Scale (ARMS). The study also aimed to evaluate the impact of patient counselling on improving adherence to antihypertensive medications among hemodialysis patients.

METHODOLOGY:

A total of 10 hypertensive patients undergoing maintenance hemodialysis were included in this prospective observational pilot study conducted in the Department of Nephrology at a multispecialty hospital in Thiruvananthapuram. The study duration was 3 months. All relevant data were collected from case records and direct patient interviews using a predesigned data collection form. Medication adherence was assessed using the ARMS questionnaire before and after counselling sessions. Statistical analysis was carried out using a paired t- test.

RESULTS:

A total of 10 patients were included in this pilot study, out of which 9 were male and 1 was female. The mean adherence score before counselling was 28.0 ± 5.58, and after counselling, it was 19.30 ± 6.50. The mean difference was 8.70, with a t-value of 10.83 and a p-value of 0.001 ($p < 0.05$), indicating a statistically significant improvement in medication adherence following counselling. Most patients showed better adherence and understanding of the importance of antihypertensive therapy after pharmacist-led education.

CONCLUSION:

In conclusion, the study found that structured counselling and education had a significant positive impact on medication adherence among hypertensive patients undergoing hemodialysis. Pharmacist-led interventions improved patient awareness, adherence, and overall therapeutic outcomes. Continuous counselling and follow-up are recommended to maintain adherence and blood pressure control in hemodialysis patients.

KEYWORDS: Hypertension, Hemodialysis, Antihypertensive Drugs, Medication Adherence, ARMS Scale, Patient Counselling.

INTRODUCTION

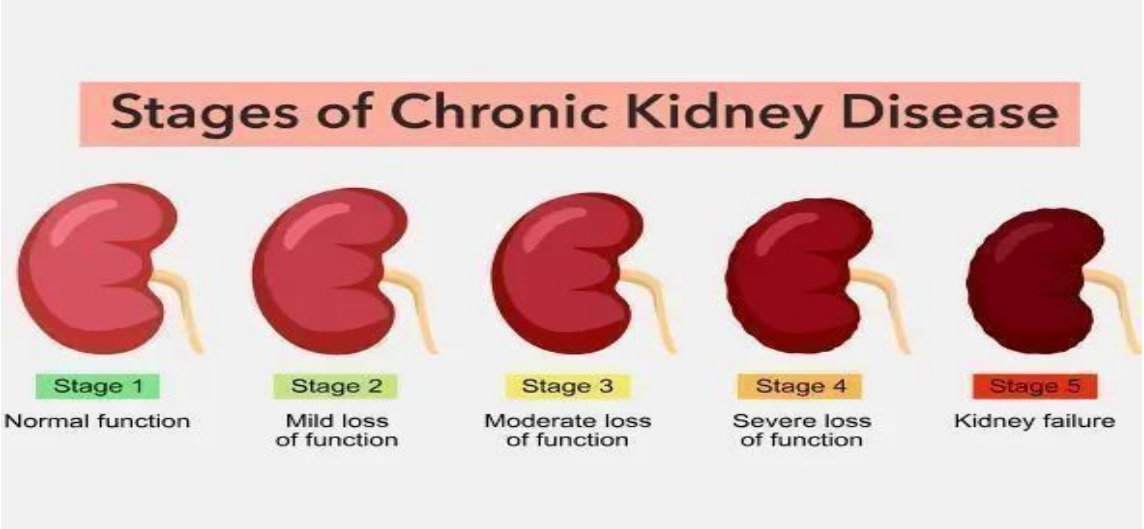
CHRONIC KIDNEY DISEASE (CKD)

Chronic Kidney Disease (CKD) is a progressive loss of kidney function over several months to years, characterized by the presence of kidney damage or an estimated Glomerular Filtration Rate (eGFR) less than 60 mL/min/1.73 m^2 persisting for 3 months or more, irrespective of cause, resulting in the need for renal replacement therapy (Dialysis or Transplantation)

STAGES OF CHRONIC KIDNEY DISEASE

KIDNEY DAMAGE STAGES	DESCRIPTIONS	eGFR(ml/min/1.73m^2)
0	With risk factor for CKD	>90
1	With evidence of kidney damage	>90

2	Mild decrease in GFR	60-89
3	Moderate decrease in GFR	30-59
4	Severe decrease in GFR	15-29
5	Kidney failure	<15



ETIOLOGY

In CKD, the progressive loss or damage to functioning nephrons over time results from a primary disorder or disease of the kidney, a secondary complication of systemic diseases (such as diabetes mellitus or hypertension), or an acute injury leading to irreversible kidney damage.

In 2008, the leading causes of ESRD in newly diagnosed patients were:

- Diabetes Mellitus (44%)
- Hypertension (28%)
- Chronic glomerulonephritis (7%)

Other causes include:

- Polycystic kidney disease
- Congenital malformations of the kidneys
- Nephrolithiasis
- Interstitial nephritis
- Renal artery stenosis
- Renal carcinoma
- HIV-associated nephropathy

HEMODIALYSIS

Hemodialysis is the most common type of dialysis and the one most people are familiar with. It is usually performed three times a week at dialysis centers, with each session lasting about four hours.

The main function of hemodialysis is to reduce the volume of uremic toxins in the blood, especially small and medium-sized molecules, through diffusion. It also decreases the patient's fluid volume via ultrafiltration and helps manage metabolic disturbances.

This process is achieved by a dialysis machine that takes blood from the patient and pumps it towards a semi-permeable membrane. The dialysate is pumped from the opposite direction (counter-current flow) to create a larger concentration gradient.

Without dialysis, lack of kidney function leads to metabolic acidosis as the body fails to excrete excess acid. The dialysate solution therefore requires a high bicarbonate concentration to neutralize pH and maintain a concentration gradient for bicarbonate transfer across the membrane.

Hemodialysis aims to move the patient from a state of severe metabolic acidosis to mild metabolic alkalosis, ensuring stability between sessions.

HYPERTENSION

Hypertension is one of the most frequent comorbid conditions seen in patients with Chronic Kidney Disease (CKD). It acts both as a cause and consequence of renal dysfunction. Persistent elevation of blood pressure leads to progressive nephron damage, while decreased renal function further worsens hypertension.

ETIOLOGY

Primary (Essential) Hypertension: Accounts for about 90–95% of cases; the exact cause is unknown but is associated with genetic, environmental, and lifestyle factors such as obesity, high salt intake, stress, physical inactivity, and aging.

Secondary Hypertension: Occurs due to identifiable causes such a

Chronic Kidney Disease (CKD) Renal artery stenosis. Endocrine disorders (e.g., hyperaldosteronism, Cushing's syndrome, pheochromocytoma) Medications (e.g., corticosteroids, oral contraceptives, NSAIDs) Obstructive sleep apnea

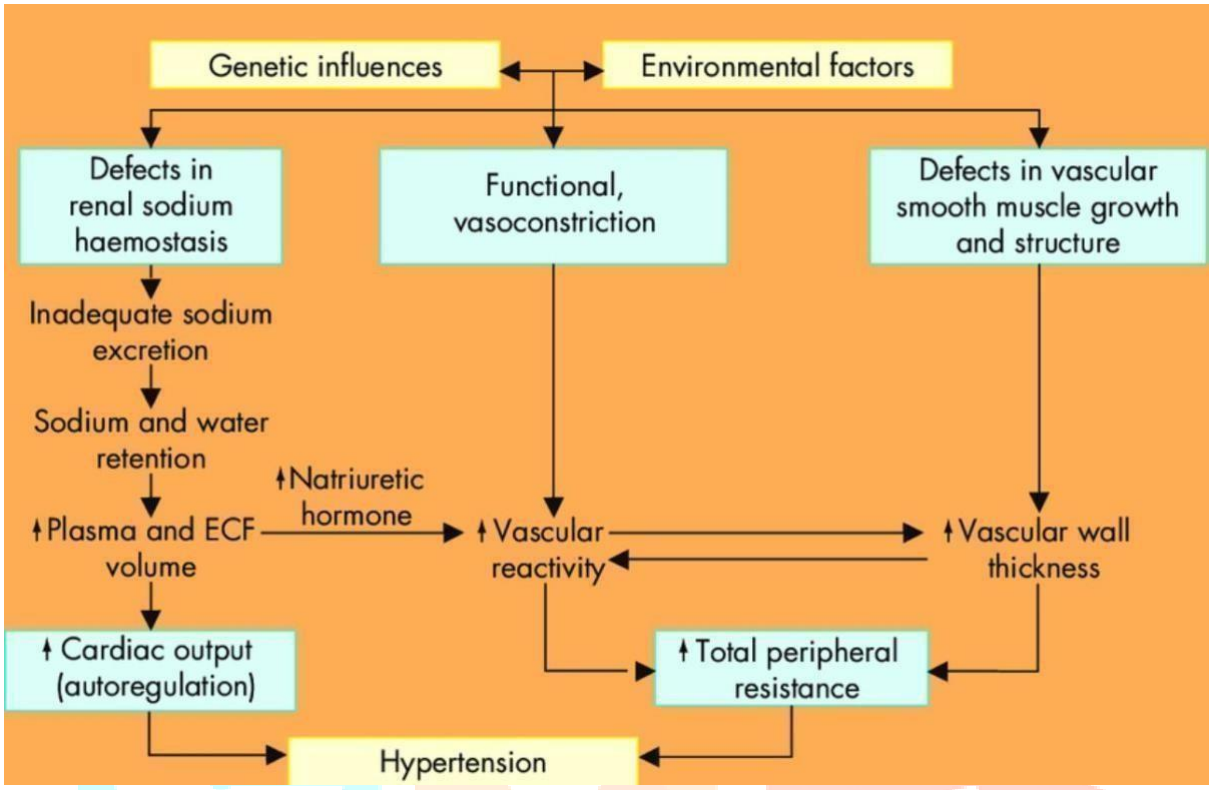
PATHOPHYSIOLOGY

Hypertension results from a complex interaction between genetic and environmental factors that increase cardiac output or systemic vascular resistance.

Key mechanisms include:

- Overactivation of the Renin–Angiotensin–Aldosterone System (RAAS): Leads to vasoconstriction and sodium retention.Sympathetic Nervous System Overactivity: Increases heart rate and vascular tone.
- Endothelial Dysfunction: Decreased nitric oxide production leads to loss of vasodilation.
- Sodium and Water Retention: Expands blood volume and increases blood pressure.

- Vascular Remodeling: Chronic high pressure causes thickening of arterial walls, sustaining hypertension.



COMPLICATION

Uncontrolled or prolonged hypertension can cause target-organ damage, including:

- Cardiovascular: Left ventricular hypertrophy, coronary artery disease, heart failure.
- Renal: Chronic kidney disease, nephrosclerosis.

TREATMENT PLAN

ACE Inhibitors (e.g., Enalapril, Lisinopril, Ramipril)

- Inhibit conversion of angiotensin I to angiotensin II, reducing vasoconstriction and aldosterone secretion
- Preferred in patients with CKD, diabetes, or hear failure. angioedema.
- Side effects: Dry cough, hyperkalemia, and rare

Angiotensin Receptor Blockers (ARBs) (e.g., Losartan, Valsartan, Telmisartan)

- Block angiotensin II receptors, preventing vasoconstriction and sodium retention.
- Used as an alternative in patients intolerant to ACE inhibitors.
- Side effects: Hyperkalemia, dizziness.

Calcium Channel Blockers (CCBs) (e.g., Amlodipine, Diltiazem, Verapamil)

- Reduce peripheral vascular resistance by blocking calcium influx in vascular smooth muscles.
- Particularly effective in elderly patients and those of African descent.
- Side effects: Ankle edema, headache, flushing.

Beta-Blockers (e.g., Metoprolol, Atenolol, Carvedilol)

Decrease heart rate, myocardial contractility, and renin release. Useful in patients with coronary artery

disease,
heart failure, or post-MI

Side effects: Bradycardia, fatigue, bronchospasm.

Diuretics:

Thiazide diuretics (e.g., Hydrochlorothiazide, Loop diuretics (e.g., Furosemide):
Potassium-sparing diuretics (e.g., Spironolactone)

Useful in resistant hypertension.
Side effects: Electrolyte imbalance, dehydration.

Alpha-Blockers (e.g., Prazosin, Doxazosin):

Cause vasodilation by blocking alpha-adrenergic receptors. Used as add-on therapy or in patients with benign prostatic hyperplasia (BPH).

Central Acting Agents (e.g., Clonidine, Methyldopa):

Decrease sympathetic outflow from the central nervous system.

AIM OF THE STUDY

To evaluate and analyze the prescribing pattern of antihypertensive drugs and assess antihypertensive medication adherence in patients undergoing hemodialysis.

OBJECTIVES

- To assess the prescribing pattern of antihypertensive drugs in patients undergoing hemodialysis
- To investigate antihypertensive medication adherence in hemodialysis patients using the ARMS scale.
- To evaluate the impact of patient counselling on improving adherence to antihypertensive medication using a patient information leaflet.

METHODOLOGY STUDY POPULATION

A pilot study was conducted on a total of 10 patients diagnosed with Chronic Kidney Disease (CKD) undergoing maintenance hemodialysis and prescribed antihypertensive medications. Patients included in the study had persistently elevated blood pressure levels despite ongoing therapy. The study was carried out in the Department of Nephrology at a Multispecialty Hospital in Thiruvananthapuram.Written informed consent was obtained from each participant after explaining the purpose and procedure of the study in detail. Patients who were unwilling to participate or had acute complications were excluded.

DATASOURCE

All relevant data for the study were collected from patient case records, prescriptions, and direct patient interviews. Information regarding patient demographics, medical history, dialysis profile, and details of prescribed antihypertensive medications was recorded using a pre-designed data collection form. Patient adherence to antihypertensive therapy was assessed using the Adherence Refill and Medication Scale (ARMS) questionnaire. The ARMS scale consists of 12 questions, with total scores ranging from 12 to 48.

Lower scores indicate better adherence, while higher scores indicate poor adherence.

Adherence was classified as follows:

- Good adherence: <19 score
- Moderate adherence: 19–30 score
- Poor adherence: >30 score

The effect of pharmacist counselling was evaluated using a Patient Information Leaflet (PIL) provided to each participant. Post-counselling adherence was re- assessed using the same ARMS questionnaire.

The study was conducted in the Department of Nephrology at a Multispecialty Hospital in Thiruvananthapuram, following approval from the Research and Ethical Committee. Written informed consent was obtained from all participants prior to inclusion in the study.

STATISTICAL ANALYSIS

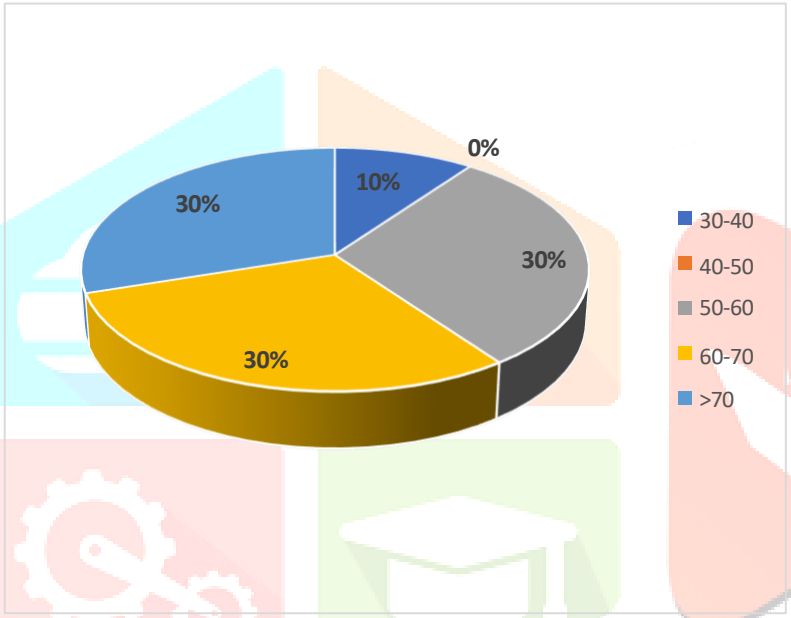
Statistical analysis was performed using Microsoft Excel. A paired t-test was used to analyze the effectiveness of patient counselling and to assess the adherence of hypertensive hemodialysis patients before and after counselling using the Adherence to Refill and Medication Scale (ARMS).The adherence scores of patients before and after counselling were compared. The mean adherence score before counselling was 28.0 ± 5.58, and after counselling, it was 19.30 ± 6.50. The mean difference was 8.70, with a t-value of 10.83 and a p-value of 0.001 ($p < 0.05$).Since the p-value was less than the specified significance level of 0.05, the results were statistically significant and provided strong evidence against the null hypothesis. Hence, the null hypothesis was rejected, indicating a significant improvement in medication adherence among hypertensive hemodialysis patients after counselling.

RESULTS AND DISCUSSION

IN THIS PILOT STUDY 10 PATIENTS WERE ENROLLED ACCORDING TO INCLUSION CRITERIA AND EXCLUSION CRITERIA

AGE WISE DISTRIBUTION OF PATIENTS

AGE IN YEARS	NUMBER (n=10)	PERCENTAGE (100%)
30-40	1	10
40-50	0	0
50-60	3	30
60-70	3	30
>70	3	30

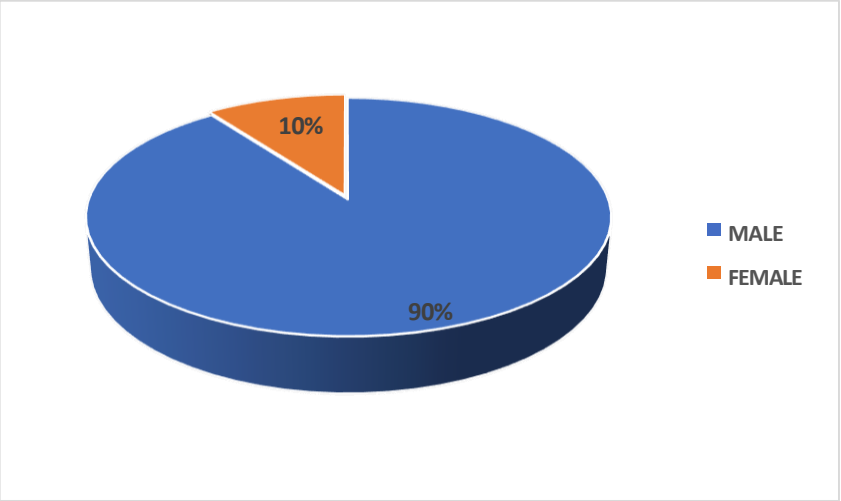


Out of 10 patients included in the study, 10% belonged to the age group of 30– 40 years, 30% were in the age group of 50–60 years, 30% were in the age group of 60–70 years, and 30% were above 70 years of age. No patients were found in the age group of 40–50 years. This indicates that the occurrence of patients undergoing hemodialysis was more common among the elderly, showing an increasing trend with advancing age.

In the present study, the majority of patients (60%) belonged to the age group of 50–70 years, while only 10% were between 30–40 years. This finding indicates that the prevalence of end-stage renal disease increases with advancing age, possibly due to a higher incidence of comorbid conditions such as hypertension and diabetes among older adults.

GENDER WISE DISTRIBUTION OF PATIENTS

GENDER	NUMBER(n=10)	PERCENTAGE (100%)
MALE	9	90 %
FEMALE	1	10 %

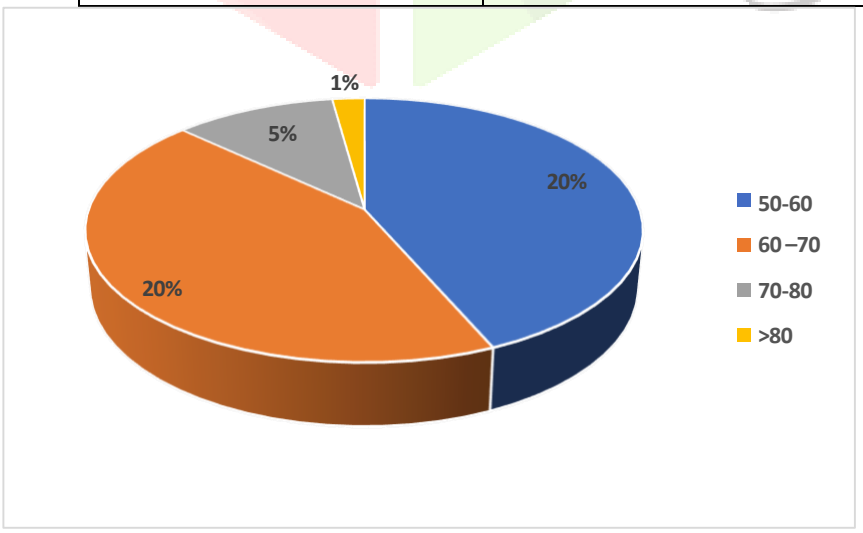


Out of 10 patients, 90% were male and 10% were female. This suggests that the prevalence of patients undergoing hemodialysis was higher among males compared to females in the study population.

In the present study, 90% of the patients were males and 10% were females, showing a clear male predominance. This may be due to biological factors such as the protective effect of estrogen in females and the adverse impact of testosterone on kidney function in males. Additionally, lifestyle factors like smoking, alcohol use, and higher rates of hypertension and diabetes among males contribute to the increased risk of kidney disease. Limited healthcare access for females in some populations may also explain their lower representation in the study.

DISTRIBUTION OF WEIGHT

WEIGHT (Kg)	NUMBER (n=10)	PERCENTAGE (100%)
50-60	2	20
60 –70	2	20
70-80	5	5
>80	1	10

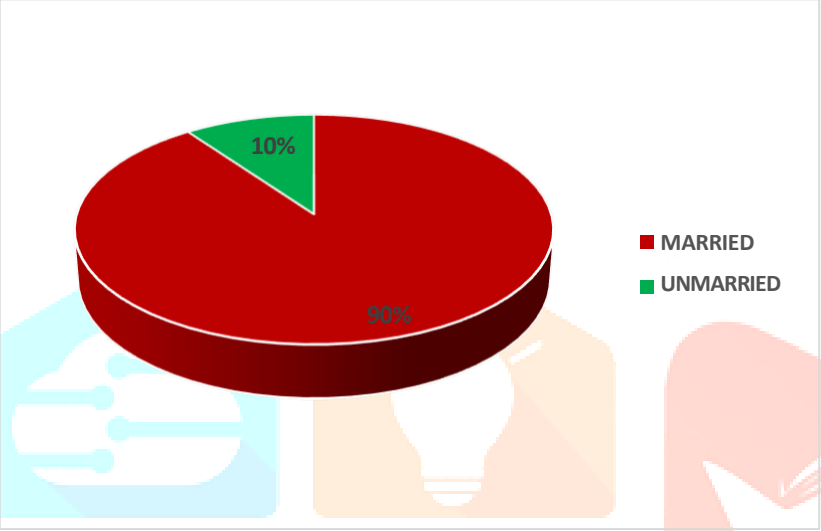


Out of 10 patients undergoing hemodialysis, 20% had a body weight between 50–60 kg, 50% were in the range of 60–70 kg, 20% were between 70–80 kg, and 10% had a weight above 80 kg. The results indicate that the majority of patients undergoing haemodialysis belonged to the 60–70 kg weight group.

In the present study, 20% of patients had a body weight between 50–60 kg, 20% between 60–70 kg, 50% between 70–80 kg, and 10% had a weight above 80 kg. The majority of patients were within the 70–80 kg range, indicating that most hemodialysis patients were either overweight or within the higher normal weight range. This could be due to fluid retention commonly seen in patients with end-stage renal disease, as well as reduced physical activity and metabolic changes associated with chronic kidney disease.

DISTRIBUTION OF MARITAL STATUS

MARITAL STATUS	NUMBER (n=10)	PERCENTAGE (100%)
MARRIED	9	90
UNMARRIED	1	10

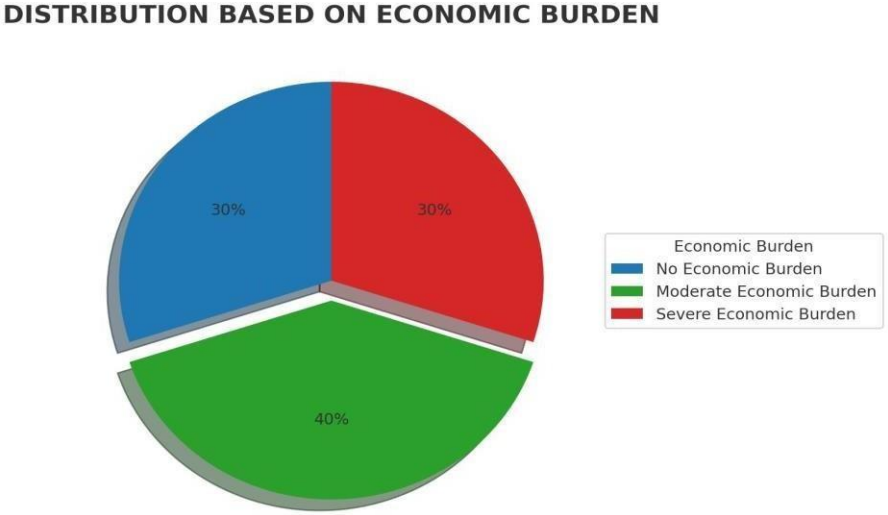


Out of 10 patients, 90% were married and 10% were unmarried. This shows that a higher proportion of married individuals were undergoing hemodialysis compared to unmarried individuals in the study population.

DISTRIBUTION BASED ON ECONOMIC BURDEN

ECONOMIC BURDEN	NUMBER (n=10)	PERCENTAGE (100%)
NO ECONOMIC BURDEN	3	30%
MODERATE ECONOMIC BURDEN	4	40%
SEVERE ECONOMIC BURDEN	3	30%

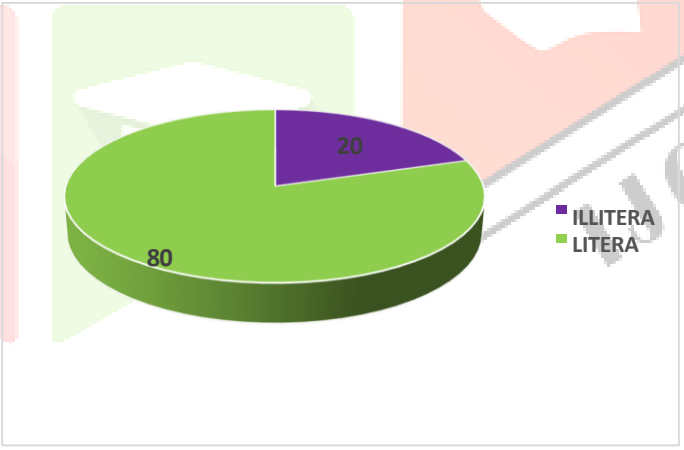
The table shows that the majority of patients (40%) experienced a moderate economic burden due to



treatment expenses, transportation costs, and medication requirements. Meanwhile, 30% reported severe economic burden, indicating significant financial stress possibly affecting treatment adherence. The remaining 30% reported no significant economic burden, likely due to financial stability or insurance support.

DISTRIBUTION OF LITERACY STATUS

LITERACY	NUMBER (n=10)	PERCENTAGE (100%)
ILLITERATE	2	20
LITERATE	8	80

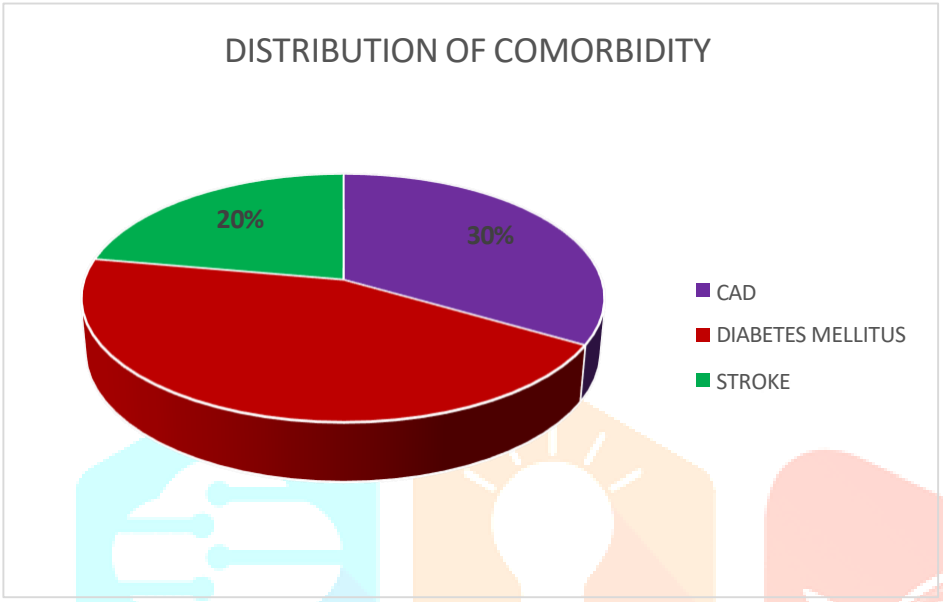


The majority of patients in the study were literate (80%), while 20% were illiterate. This may be because educated individuals are generally more aware of health problems and more likely to seek timely medical care, leading to their higher representation among dialysis patients. Literacy also helps patients understand treatment instructions, medication use, and dietary restrictions, which are crucial in managing chronic kidney disease.

However, the presence of illiterate patients (20%) indicates that kidney disease affects people from all educational backgrounds. Illiterate individuals may have limited health awareness, poor access to healthcare information, and difficulty adhering to complex treatment regimens, which can increase disease progression and complications.

DISTRIBUTIOB OF COMORBIDITY

COMORBIDITY	MALE	FEMALE	TOTAL(n=10)	PERCENTAGES
CAD	2	1	3	30%
DIABETIC MELLITUS	3	2	5	50%
STROKE	1	1	2	20%



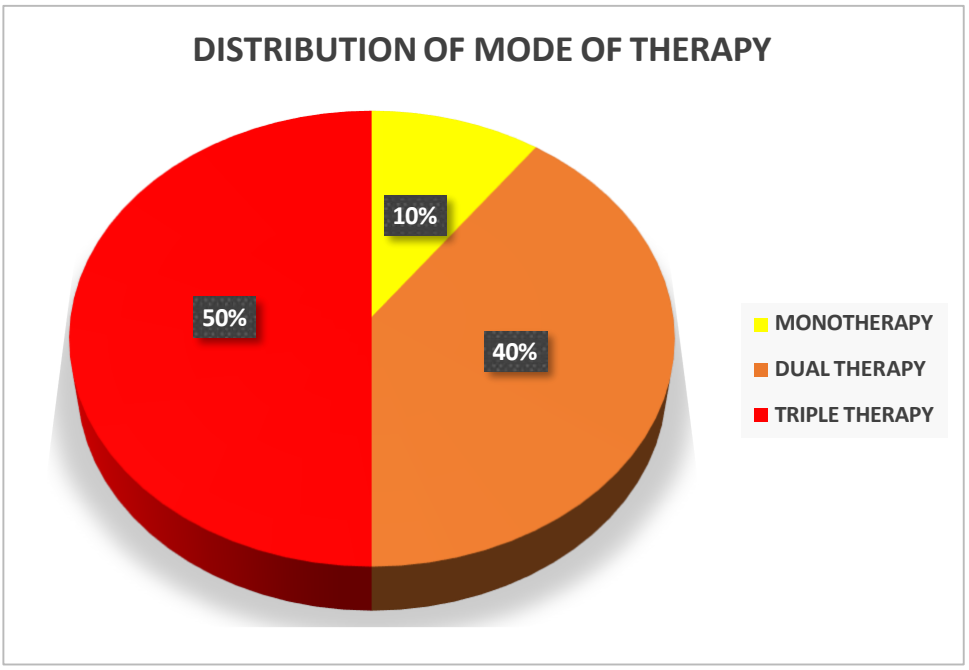
The majority of patients in this study had diabetes mellitus (50%), followed by coronary artery disease (30%) and stroke (20%). This is because diabetes mellitus is one of the leading causes of chronic kidney disease and end-stage renal disease. Long-term uncontrolled blood sugar levels damage the renal blood vessels, leading to kidney failure.

Additionally, cardiovascular diseases such as CAD and stroke are common in dialysis patients due to shared risk factors like hypertension, dyslipidemia, and diabetes. The coexistence of these comorbidities further increases the burden on kidney function and worsens patient outcomes.

PRESCRIPTION PATTERN OF ANTIHYPERTENSIVE DRUG

DISTRIBURION OF MODE OF THERAPY

MODE OF THERAPY	NO OF DRUG (n=10)	PERCENTAGE (%)
MONOTHERAPY	1	10%
DUAL THERAPY	4	40%
TRIPLE THERAPY	5	50%

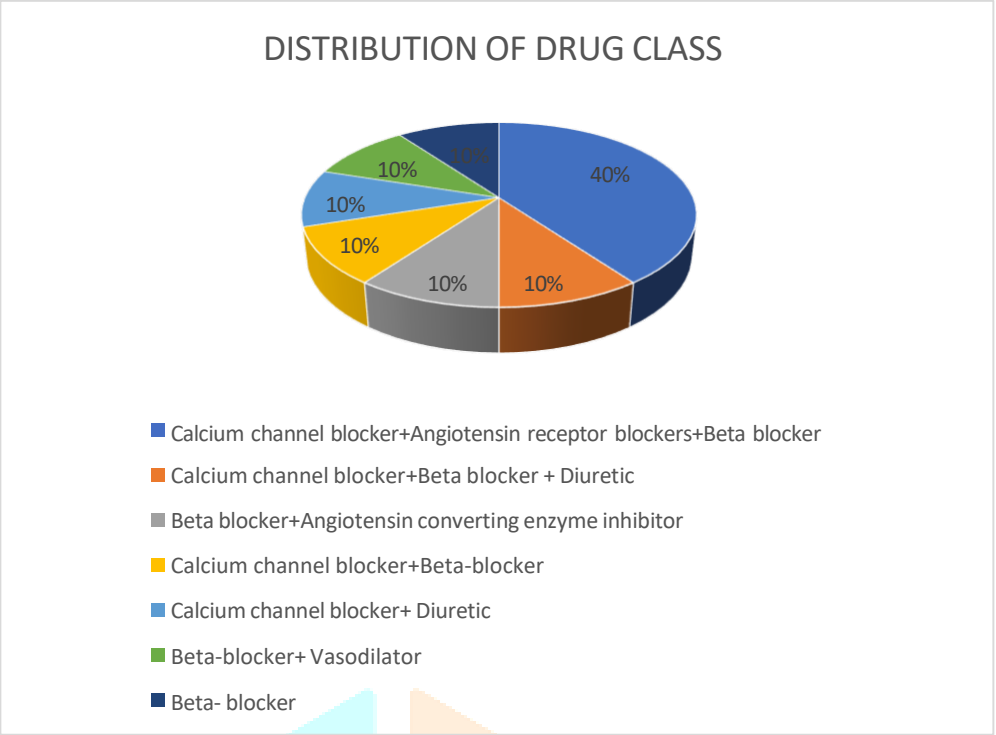


In the present study, 50% of patients were on triple therapy, 40% were on dual therapy, and only 10% were on monotherapy. The higher proportion of patients receiving triple therapy indicates that most hemodialysis patients require multiple antihypertensive drugs to achieve optimal blood pressure control. This is due to resistant hypertension, which is common in end-stage renal disease because of fluid overload, altered renin-angiotensin activity, and vascular stiffness.

Combination therapy helps target different mechanisms to effectively manage blood pressure in these patients.

DISTRIBUTION OF ANTIHYPERTENSIVE DRUG CLASS

DRUG CLASS	**NO OF PATIENTS (n=10)**	**PERCENTAGE(%)**
Calcium channel blocker+Angiotensin receptor blockers+Beta blocker	4	40%
Calcium channel blocker+Beta blocker + Diuretic	1	10%
Beta blocker+Angiotensin converting enzyme inhibitor	1	10%
Calcium channel blocker+Beta-blocker	1	10%
Calcium channel blocker+ Diuretic	1	10%
Beta-blocker+ Vasodilator	1	10%
Beta- blocker	1	10%

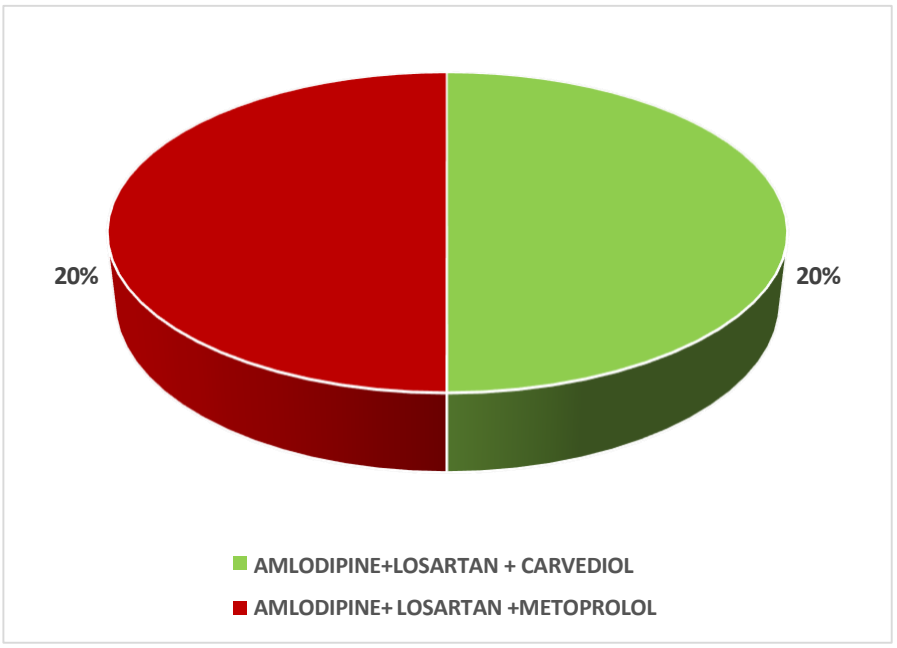


In the present study, calcium channel blockers combined with angiotensin receptor blockers (40%) were the most commonly prescribed antihypertensive drug class among hemodialysis patients. This combination is preferred because it effectively controls blood pressure, reduces cardiovascular risk, and provides renal protection. Other drug classes such as beta-blockers, diuretics, and ACE inhibitors were used in fewer patients depending on individual comorbid conditions and response to therapy. The choice of multiple drug classes reflects the need for combination therapy to achieve adequate blood pressure control in patients with chronic kidney disease.

DISTRIBUTION OF ANTIHYPERTENSIVE DRUGS

ANGIOTENSIN RECEPTOR BLOCKER + BETA BLOCKER

DRUGS	NO OF PATIENTS(n=10)	PERCENTAGE%
AMLODIPINE+LOSARTAN + CARVEDIOL	2	20%
AMLODIPINE+ LOSARTAN +METOPROLOL	2	20%



CALCIUM CHANNEL BLOCKER +BETA-BLOCKER+DIURETIC

DRUGS	**NO OF PATIENTS(n=10)**	PERCENTAGE%
AMLODIPINE+METOPROLOL+ FUROSEMIDE	1	10%

BETA-BLOCKER+ANGIOTENSIN CONVERTING ENZYME INHIBITOR

DRUGS	**NO OF PATIENTS(n=10)**	PERCENTAGE%
CARVEDILOL+RAMIPRIL	1	10%

CALCIUM CHANNEL BLOCKER+ BETA-BLOCKER

DRUGS	**NO OF PATIENTS(n=10)**	**PERCENTAGE%**
NIFEDIPINE+FUROSEMIDE	1	10

CALCIUM CHANNEL BLOCKER+DIURETIC DRUGS

DRUGS	**NO OF PATIENTS(n=10)**	**PERCENTAGE%**
NIFEDIPINE+FUROSEMIDE	1	10

BETA-BLOCKER + VASODILATOR

DRUGS	**NO OF PATIENTS(n=10)**	**PERCENTAGE%**
METOPROLOL+CLONIDINE	1	10%

BETA-BLOCKER

DRUGS	NO OF PATIENTS (n=10)	PERCENTAGE%
CARVEDIOLOL	1	10%

Among the 10 hemodialysis patients included in the study, calcium channel blocker + angiotensin receptor blocker + beta blocker was the most frequently prescribed combination (20%), followed by various dual and triple therapies involving calcium channel blockers, beta blockers, diuretics, and ACE inhibitors (10% each). This prescription pattern reflects a tendency toward combination therapy to achieve optimal blood pressure control and address the complex cardiovascular needs of patients undergoing hemodialysis. The frequent use of calcium channel blockers and beta blockers suggests their effectiveness and safe profile in this population.

MEDICATION ADHERENCE

MEDICATION ADHERENCE LEVEL BASED ON PATIENTS AGE

AGE IN YEARS	NUMBERS	PERCENTAGE	ADHERENCE LEVEL
30-40	1	10%	HIGH ADHERENCE LEVEL
40-50	0	0	
50-60	3	30%	MODERATE
60-70	3	30%	LOW ADHERENCE
>70	3	30%	LOW ADHERENCE

In this study, medication adherence was found to decrease with increasing with age.Patients aged 30–40 years showed high adherence (10%), while those in the age groups of 60–70 years and above 70 years demonstrated low adherence (30% each). The decline in adherence among older patients may be due to factors such as forgetfulness, multiple drug use, lack of caregiver support, and poor understanding of treatment importance. This indicates the need for targeted counseling and adherence-improving strategies in elderly hemodialysis patients.

MEDICATION ADHERENCE LEVEL BASED ON PATIENTS GENDER

GENDER	NUMBER	PERCENTAGE	ADHERENCE LEVEL
Male	9	90%	HIGH ADHERENCE LEVEL
Female	1	10%	MODERATE ADHERENCE LEVEL

In this study, male patients (90%) showed a higher level of medication adherence compared to female patients (10%). This may be due to better disease awareness, regular follow-up, and a more consistent attitude toward treatment among male patients.

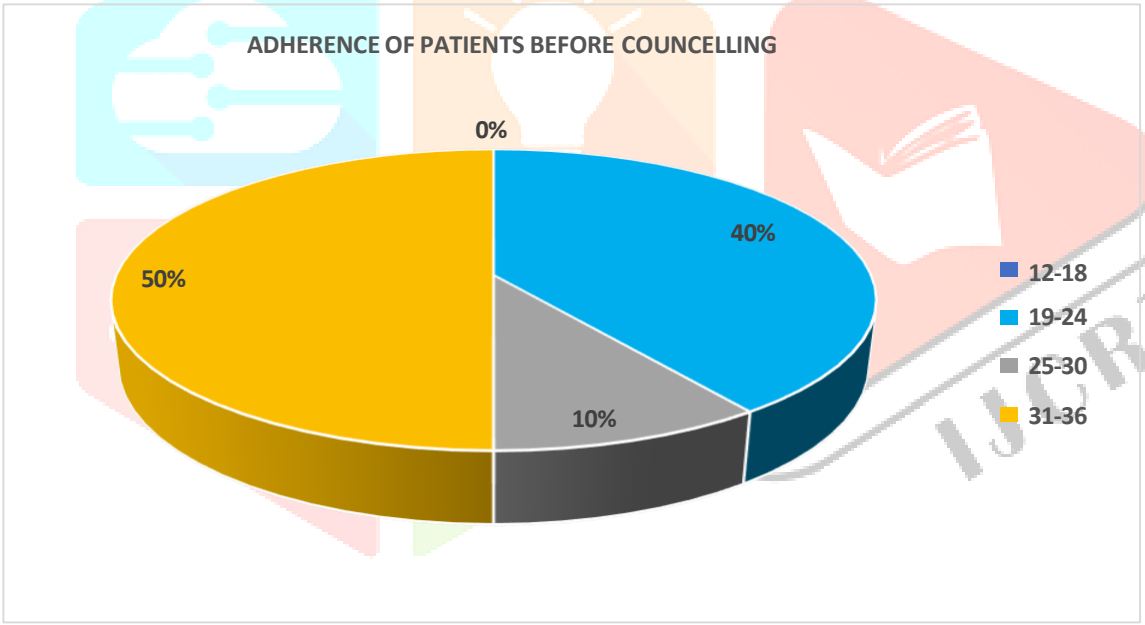
MEDICATION ADHERENCE LEVEL BASED ON LITERACY STATUS

LITERACY STATUS	NUMBER(n=10)	PERCENTAGE	ADHERENCE LEVEL
LITERATE	9	90%	HIGH ADHERENCE LEVEL
ILLITERATE	1	10%	LOW ADHERENCE LEVEL

Patients who were literate (90%) showed a higher level of medication adherence compared to illiterate patients (10%). This may be because literate patients better understand their disease condition, medication schedule, and the importance of adherence.

MEDICATION ADHERENCE BEFORE PATIENTS COUNCELLING

SCORE	NUMBER(n=10)	PERCENTAGE(100%)
12-18	0	0
19-24	4	40
25-30	1	10
31-36	5	50

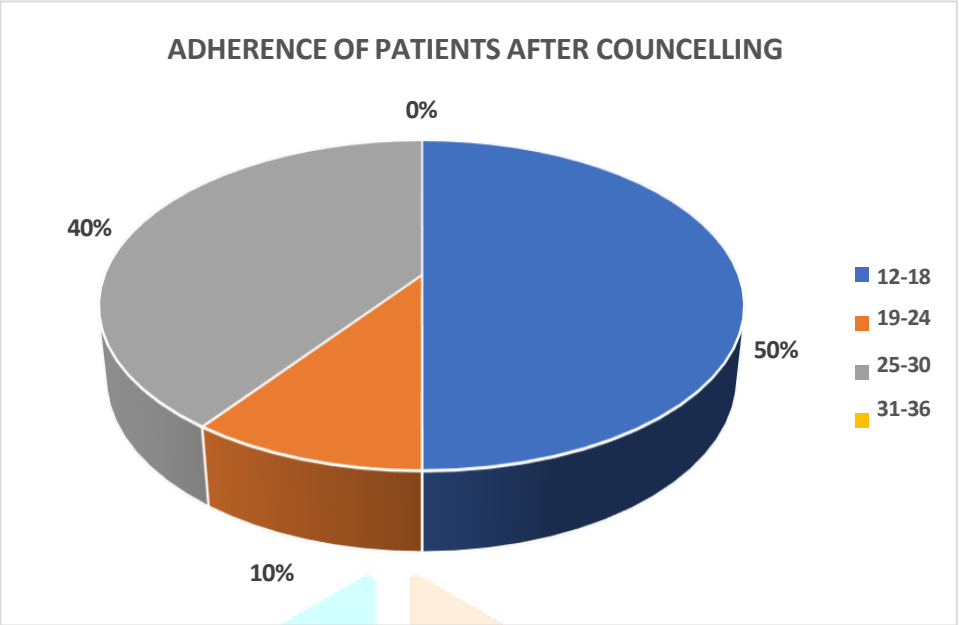


Among 10 patients undergoing hemodialysis, 50% had adherence scores between 31–36, indicating good adherence, while 40% scored between 19–24, and 10% scored between 25–30. None of the patients scored in the lowest adherence range (12–18). These findings suggest that before counselling, half of the patients already demonstrated good adherence to their prescribed antihypertensive medications, whereas the remaining showed moderate adherence levels. This highlights the importance of counselling to further improve adherence and ensure optimal therapeutic outcomes in hemodialysis patients.

MEDICATION ADHERENCE AFTER PATIENT COUNCELLING

SCORE	NUMBER(n=10)	PERCENTAGE(100%)
12-18	5	50
19-24	1	10

25-30	4	40
31-36	0	0



Out of 10 patients undergoing hemodialysis, 50% had an adherence score between 12–18, 10% scored between 19–24, and 40% scored between 25–30 after counselling. None of the patients scored above 30. The results indicate that patient counselling played a significant role in improving medication adherence among hemodialysis patients. Although a few patients showed moderate adherence, a considerable number demonstrated high adherence levels following the counselling sessions.

COMPARISON OF MEDICATIONADHERENCE SCORE BEFORE AND AFTER PATIENT COUNSELLING

To compare the adherence score of patients before and after treatment a parametric statistical test called paired t-test is applied. The null hypothesis for the comparison is there is no difference between the adherence score of patients before and after counselling.

Table: Comparison of adherence score

	Adherence Score Before Counselling	Adherence Score after Counselling
Mean	28.0	19.30
SD	5.58	6.50
Mean Difference	8.70	
t-value	10.83	
P-value	.001* (p<.05)	

The paired t-test comparison of the adherence significant (t value=10.83, p value=.001). Since the p-value is less than the specified significance level of .05, the test results were statistically significant and have strong evidence against the null hypothesis. Hence reject the null hypothesis and conclude that there is a significant difference between the adherence score of patients before and after counsellig.

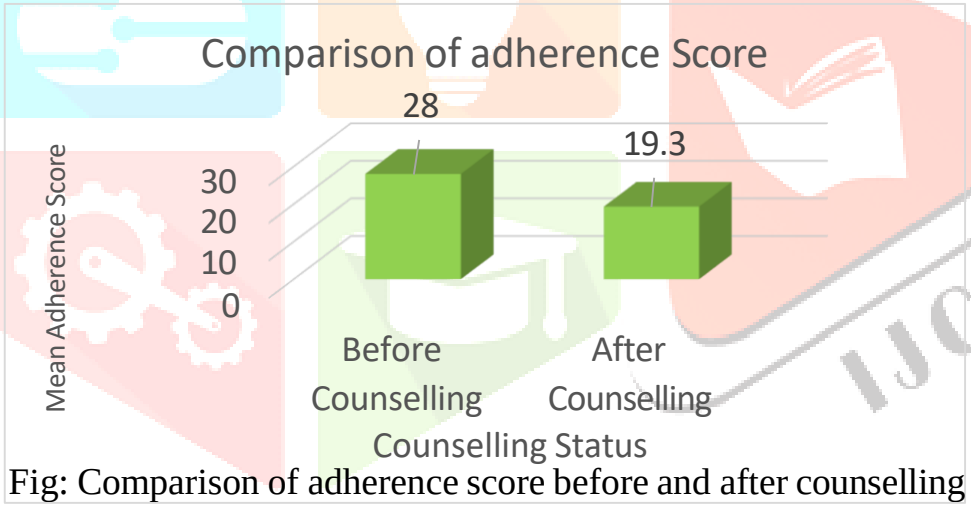


Fig: Comparison of adherence score before and after counselling

RESULT AND DISCUSSION

The comparison of adherence scores before and after counselling demonstrated a significant improvement in medication adherence among hemodialysis patients prescribed antihypertensive drugs. The mean adherence score before counselling was 28.0 ± 5.58, while the mean score after counselling decreased to 19.30 ± 6.50, indicating enhanced adherence levels. The mean difference between the two scores was 10.83, and the p-value was 0.001 ($p<0.05$), suggesting that the difference observed was statistically significant.

This shows that patient counselling and educational interventions had a positive and measurable impact on adherence behaviour. The decrease in adherence score reflects an improvement in patients' understanding of their therapy, awareness of the importance of regular medication intake, and commitment to their prescribed regimen.

Furthermore, the result supports the hypothesis that structured patient counselling, when combined with continuous follow-up and educational support, significantly improves treatment adherence in hemodialysis patients. Improved adherence is crucial for effective blood pressure control, reduced cardiovascular complications, and better overall health outcomes in this vulnerable patient population.

SUMMARY

The pilot study was conducted to evaluate the prescription pattern of antihypertensive drugs and assess medication adherence among patients undergoing hemodialysis. A total of 10 patients were included to assess feasibility and identify early trends before the full-scale study.

Age-wise Distribution of Patients

The majority of patients were within the 50–70 years age group (60%), followed by >70 years (30%) and 30–40 years (10%). This pattern highlights that hypertension and chronic kidney disease (CKD) are more common in middle- aged and elderly individuals. The increase in prevalence with age can be attributed to vascular stiffness, long-standing diabetes, and cardiovascular comorbidities.

Weight-wise Distribution of Patients

Most patients had a body weight between 60–70 kg (50%), followed by 50–60 kg (20%), 70–80 kg (10%), and >80 kg (10%). The predominance of normal to overweight individuals indicates that overweight status is a significant risk factor for hypertension and CKD. Weight management through dietary changes and physical activity remains crucial in long-term blood pressure control.

Literacy Status

Among the study participants, 80% were literate and 20% were illiterate. Illiteracy can adversely affect treatment comprehension and adherence to dietary and medication regimens. This underlines the need for effective patient counseling and education programs designed in simple, local language to improve understanding and compliance.

Gender Distribution

Out of 10 patients, 9 were male (90%) and 1 was female (10%). The male predominance may reflect a higher incidence of hypertension and CKD among men or increased healthcare-seeking behavior. Lifestyle habits, such as smoking, alcohol intake, and occupational stress, could also contribute to this difference.

Marital Status

Among the participants, 9 (90%) were married and 1 (10%) was unmarried. The predominance of married individuals suggests better family support, which may positively influence medication adherence and follow-up in chronic conditions.

Comorbidity Distribution

The findings show that diabetes mellitus (50%) was the most common comorbidity, followed by coronary artery disease (30%) and stroke (20%). The high prevalence of diabetes among hemodialysis patients highlights its role as a key contributor to CKD progression.

Prescription Pattern of Antihypertensive Therapy

Most patients were prescribed combination therapy (dual or triple), reflecting the complexity of hypertension management in CKD patients. The most frequently prescribed combination was Calcium channel blocker + ARB + Beta-blocker (40%), followed by other multidrug combinations. These findings indicate thatphysicians often rely on multi-drug regimens for optimal blood pressure control in patients with CKD,given the difficulty of achieving target BP with monotherapy.

Economic Burden

Evaluation of financial status revealed that 40% of patients experienced moderate economic burden, 30% reported severe burden, and 30% faced no significant burden. The high treatment costs, including dialysis sessions, transportation, and multiple medications, contribute significantly to this burden and may affect adherence.

Medication Adherence

Medication adherence assessment showed that most patients demonstrated moderate adherence, while a smaller number exhibited low adherence. Factors such as financial strain, complex regimens, illiteracy, and forgetfulness were major barriers. Strengthening patient follow-up and providing financial or social support can improve adherence rates and treatment outcomes.

This pilot study effectively demonstrated the feasibility of data collection and provided key preliminary insights. The analysis revealed that age, comorbidities, literacy level, and economic burden play crucial roles in shaping both prescription patterns and medication adherence.

The high prevalence of combination antihypertensive therapy underscores the difficulty of achieving adequate BP control in CKD.

Overall, the pilot study lays a strong foundation for the main observational study, helping to refine data collection methods and focus on factors influencing therapeutic outcomes in hemodialysis patients.

CONCLUSION

This pilot study focused on evaluating the prescription pattern of antihypertensive drugs and assessing medication adherence among patients undergoing hemodialysis due to chronic kidney disease (CKD). Hypertension is one of the most common complications associated with CKD and plays a major role in the progression of renal dysfunction. Effective blood pressure control is therefore essential to prevent cardiovascular events and delay further kidney damage. The findings of the study revealed that most patients were prescribed dual or triple antihypertensive therapy, mainly consisting of calcium channel blockers, beta- blockers, angiotensin receptor blockers (ARBs), diuretics, and ACE inhibitors. This reflects the complexity of hypertension management in CKD patients on hemodialysis, where multiple comorbidities such as diabetes mellitus, coronary artery disease, and stroke further complicate treatment regimens.

Despite receiving appropriate therapy, medication adherence was found to be suboptimal in several patients, primarily due to economic burden, illiteracy, polypharmacy, and lack of disease awareness. Poor adherence can lead to uncontrolled hypertension, increased cardiovascular risk, and reduced dialysis

efficiency.

The clinical pharmacist plays a crucial role in overcoming these challenges. By providing individualized patient counseling, monitoring therapy outcomes, and educating patients on the importance of adherence and lifestyle modification, the pharmacist can help improve treatment success. Pharmacist interventions also assist in identifying drug-related problems, ensuring rational selection and dosing of antihypertensive medications, and enhancing communication between patients and healthcare providers.

In conclusion, this pilot study emphasizes that the involvement of a clinical pharmacist in the multidisciplinary management of CKD patients on hemodialysis can significantly improve medication adherence, optimize antihypertensive therapy, and ultimately enhance the quality of life and clinical outcomes of these patients.

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