



ASSESSMENT OF PRESCRIPTION APPROPRIATENESS AND PATIENT COUNSELLING AMONG DIALYSIS PATIENTS IN SELECTED DIALYSIS UNITS OF KALABURAGI

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ABSTRACT

Background: The World Health Organisation (WHO) states that dialysis is a procedure that eliminates harmful substances, extra fluid, and ensures that the balance of solutes in the body remains normal. The primary types of dialysis are haemodialysis (HD) and peritoneal dialysis (PD). Patients suffering from End-Stage Renal Disease (ESRD) who are undergoing dialysis often present complex medical conditions, commonly experience several other health issues, and are likely to be on multiple medications. Ensuring rational medication prescribing in these patients poses significant challenges, as the inappropriate use of medications can lead to increased adverse drug reactions, longer hospital stays, higher healthcare utilisation rates, and increased costs. By carefully selecting medications and involving clinical pharmacists, it is possible to enhance therapeutic results and ensure better adherence to medication regimens.

Objectives: The goals are to evaluate how appropriate the prescriptions are for dialysis patients and to offer them advice on managing their disease, medication regimens, and complications from dialysis.

Materials and Methods: A prospective interventional study was carried out in selected dialysis units in Kalaburagi. Data were gathered utilising a specifically designed data collection form, and prescriptions were analysed for appropriateness in line with the National Kidney Foundation - Kidney Disease Outcomes Quality Initiative (NKF-KDOQI) guidelines.

Results: Out of the 107 dialysis patients evaluated, 8.5% of the prescriptions were deemed inappropriate, while 91.5% were found to be appropriate.

Conclusion: Patients undergoing dialysis need adequate guidance concerning their medical condition, medications, and the dialysis procedure. The involvement of clinical pharmacists is essential in enhancing patient understanding, facilitating lifestyle adjustments, and improving overall patient care.

INTRODUCTION:

According to the World Health Organisation (WHO), dialysis is a procedure used to eliminate harmful substances and excess fluids, and to ensure a proper balance of solutes in the body. The primary methods of dialysis are haemodialysis (HD) and peritoneal dialysis (PD). Haemodialysis, the

predominant form of kidney replacement therapy (KRT) in India, entails the transfer of blood and dialysate across a semipermeable membrane, typically administered over 4 to 5 hours, three times a week in hospital settings. The National Kidney Foundation-Kidney Disease Outcomes Quality Initiative (NKF-KDOQI) suggests that patients receiving

thrice-weekly HD should achieve a minimum Kt/V of 1.2, which corresponds to a urea reduction ratio of 65%. Peritoneal dialysis consists of introducing dialysate into the peritoneal cavity via a permanent catheter and can be carried out through either continuous ambulatory peritoneal dialysis (CAPD) or automated peritoneal dialysis (APD). Chronic kidney disease (CKD) is a progressive disorder marked by irreversible loss of kidney function and interstitial fibrosis, presenting significant global public health challenges along with various complications. The most prevalent risk factors include diabetes mellitus, hypertension, glomerulonephritis, and polycystic kidney disease. Patients with CKD on maintenance haemodialysis frequently experience multiple health conditions and require many medications, complicating the process of prescribed treatment. Polypharmacy is prevalent due to complications associated with dialysis and changes in how drugs are processed in the body, heightening the chances of adverse drug reactions, drug interactions, poor medication adherence, diminished quality of life, and increased mortality rates. The improper use of medications also extends hospital stays, leads to additional healthcare utilization, and imposes economic strain. Patient education is crucial in enhancing health-related quality of life by increasing awareness of the disease, clarifying misconceptions, and encouraging adherence to medications, dietary guidelines, and lifestyle changes. The involvement of clinical pharmacists has been proven to boost medication comprehension, adherence, and treatment results through effective medication management, patient education, and the identification of drug-related issues. Given the increasing incidence of end-stage renal disease (ESRD), the scarcity of dialysis resources, and the high costs of treatment, a collaborative strategy involving nephrologists, pharmacists, dietitians, and other healthcare professionals is necessary to optimize patient care and enhance clinical outcomes for those undergoing dialysis.

DIALYSIS

WHAT IS DIALYSIS?

According to World Health Organization (WHO)- Dialysis is the process of removing toxins, excess water, and maintaining solutes normal.

They are of two types:

- Haemodialysis
- Peritoneal dialysis

WHY AND WHEN?

Dialysis should be initiated electively in patients with CKD because the disease is progressive nature.

The planning for dialysis should begin once the patient's creatinine clearance (C_{cr}) drops below 30 mL/min per 1.73 m². The primary criterion for initiation of dialysis is the patient's clinical status: the presence of persistent anorexia, nausea, and vomiting, especially if accompanied by weight loss, fatigue, declining serum albumin levels, uncontrolled HTN or congestive heart failure, and neurologic deficits or pruritus.

Out of 2,786,000 patients being treated for ESRD, approximately 2,164,000 were undergoing dialysis treatment.

WHAT ARE THE COMPLICATIONS?

- Hypotension/hypertension
- Cramps, etc.

COUNSELLING POINTS: -

- Avoid nephrotoxic drugs
- Oral fluids – 1 L/day
- Fruits allowed – Apple, Pineapple, Papaya, Guava
- Coconut water – Not allowed
- Diet – HTN/CKD

Do's and Don'ts for patients on dialysis

- Consume less salt or salty foods
- Use fresh herbs and whole spices or lemon juice/vinegar to add flavour to the food
- Avoid green leafy vegetables, banana, citrus fruits, coconut water, potato
- Fruits which you can consume in moderation (1 fruit per day) are Papaya, Guava, Apple, Cranberries & Blueberries (not more than 4–5 pieces)
- Avoid fast food, meat, cola beverages, dry fruits
- Eat a high quality protein meal that includes foods like eggs, soy, poultry/meat, lentils and fish.

COMPLICATION	INCIDENCE (%)	AETIOLOGY / PREDISPOSING FACTORS
Hypotension	20–30	Hypovolemia and excessive ultrafiltration; antihypertensive drugs before dialysis; diastolic dysfunction; low calcium and sodium in dialysate; food intake before or during dialysis; high dialysate temperature
Hypertension	5–15	Increased plasma sodium concentration; intravascular volume overload; activation of the renin–angiotensin–aldosterone system; dialytic removal of antihypertensive drugs
Muscle cramps	5–20	Muscle hypoperfusion due to hypovolemia and ultrafiltration; hypotension; electrolyte imbalance
Acid–base imbalance	—	Inadequate dialysis; altered bicarbonate balance
Nausea and vomiting	5–15	Hypotension; dialyzer reaction
Headache	~5	Dialysis disequilibrium syndrome; caffeine withdrawal due to dialytic removal
Pruritus	~5	Inadequate dialysis; xerosis; secondary hyperparathyroidism; histamine release; mast cell proliferation; abnormal skin electrolyte concentration
Fever and chills	<1	Endotoxin exposure; dialysis catheter–related infection

Table No. 1: Table depicting complications, Incidence, and predisposing factors of dialysis

REVIEW OF LITERATURE:

- Kevin M et al.**, have studied the HD and PD remain the most widely available and commonly used ESRD treatments. Despite continual advances in dialysis and transplantation, kidney disease is associated with significant morbidity and mortality.
- Joanna Q , et al. (dipiro. 11th.edition):** The incidence of CKD has recently declined but the prevalence continues to increase especially in high-risk populations' multidisciplinary team structure is a rational approach to effectively design and implement individual patient care plans often required in the CKD population, given the extensive nonpharmacologic and pharmacologic interventions. Thus, pharmacists are well positioned to actively participate in the chronic disease and medication management of ambulatory CKD and dialysis patients as well as those who are hospitalized.
- N.Vanitha Rani, P.Soundararajan , et al. (2013):** Medication adherences is a major issue posing a greater burden on management of ESRD. The involvement of

the clinical pharmacist in the dialysis unit in providing patient education can improve patient adherence towards the medication by improving their knowledge towards their medications and thereby lessen the burden of the prescribing physicians.

- Judith G. M and Monica B , et al. (2020):** carried out a retrospective cohort study on Prescription Patterns in Dialysis Patients: Differences Between Haemodialysis and Peritoneal Dialysis Patients and Opportunities for Deprescription In total, 3017 patients met inclusion criteria (2243 HD, 774 PD). The mean age was 66.2 ± 14.8 years. The HD group had more patients over 80 years old (22.1% vs 12.5%) and more patients with diabetes and CV disease. The mean number (standard deviation [SD]) of discrete prescribed medications was 17.71 (5.72) overall with more medications in the HD group versus the PD group. The mean number of medications increased with dialysis vintage in both groups. HD patients were on more medications for renal complications and management of symptoms than PD patients. Of the total number of medications

prescribed, 5.02 (2.78) were classified as a PIM, with the number of PIMs higher in HD vs PD patients: 5.37 (2.83) versus 4.02 (2.37).

5. **PurnaAtray and Anjali , et al. (2021):** carried out an observational study on evaluation of drug prescribing pattern in chronic kidney disease patients at tertiary care hospital in northern India the Mean age calculated was 51.51 ± 16.07 (Mean $\pm$ SD) years with male predominance (69.15%). Hypertension (33.17%) and Diabetes (26.63%) are the most common comorbidities. Average number of drugs prescribed per prescription was 7.83. On the basis of first anatomical level of ATC classification, drugs from blood forming agents were highly recommended class of drugs (20.15%), followed by cardiovascular system agents contributing (19.08%), and drugs from alimentary tract and metabolism were (17.94%).
6. **S. Belagodu, et al. (2009) :** Among the 102 haemodialysis patients enrolled, 90 (68 male and 22 female) completed the study. The baseline difference in the gender, age, education, number of medications, duration of dialysis, residential area (rural, urban and semi urban) of patients was not statistically significant ($p > 0.05$). clinical pharmacist-provided patient education was effective in increasing the medication knowledge and adherence pattern of haemodialysis patients. To identify the factors that influence adherence and to assess the influence of other interventional strategies on medication adherence, further research is required to evaluate whether improvements in knowledge and adherence are sustained in the longer term, and whether the education affects clinical outcomes.
7. **Dixon T, Guru P. M (2019) :** carried out a prospective interventional study on Effect of patient counseling on quality of life of hemodialysis patients in India. : Health related quality of life in test group showed a consistent improvement of 2% in six months. Improvement of awareness by patient counseling was also improved.
8. **Anurodh Ghimirey , et al. (2013) :** carried out a prospective study on Evaluation of pharmacist counselling in improving knowledge, attitude, and practice in chronic kidney disease patients Mean knowledge, attitude, and practice scores before intervention were 8.16 ± 4.378 , 38.19 ± 3.217 , and 6.69 ± 0.896 , respectively, and these scores were changed to 13.75 ± 3.510 , 38.78 ± 3.035 , and 6.91 ± 0.777 , respectively, after the intervention ($p < 0.05$).
9. **Naser T and Sajid H (2020) :** carried out a Cross-sectional study on Analysis of prescription pattern in patients on maintenance haemodialysis a total of 41 prescriptions of patients were analysed. The most common associated co-morbidity was hypertension in 82.9% of the patients, followed by anaemia in 73.1% of patients and secondary hyperparathyroidism in 63.4% of the patients. 85.4% of the patients had more than one comorbidity. The total number of drugs prescribed was 504 and the average number of prescriptions per patient was 12.3. The percentage of drugs prescribed using generic name was 71.4 and 65.3% drugs prescribed were from the WHO essential drugs list. Total number of Fixed dose combinations used was only 1.2%.
10. **S. Brendan, J. Ceridwen , et al. (2002) :**Patients with diabetes who need dialysis have reduced insulin clearance, so they may be more liable to hypoglycaemia with both insulin and insulin secretagogues (sulfonylureas). These patients may also be at increased risk of hypoglycaemia unawareness due to comorbid illnesses and co-prescribed drugs. Recognising that patients on dialysis are more prone to drug toxicity is the first step in avoiding harm. In general, commence with a low dose, observe closely for adverse effects and increase the dose only after a timely interval.
11. **B. Michel, P. Menno , et al. (2008):** The goal of the present review was to re-emphasise the crucial role of drug adherence in the management of CKD patients at any stage of the disease, including on maintenance haemodialysis. Poor adherence should be taken into consideration in all clinical situations in

which targets are not reached despite substantial efforts to prescribe the most adequate therapies. Because of the complexity of treatment and the high pill burden, CKD patients are at very high risk of poor adherence and should definitely be supported in their efforts to maintain good persistence. Physicians and other healthcare professionals should be aware of available strategies and collaborate to improve patient adherence by enhancing communication, reducing pill burden, and monitoring adherence when non-compliance is suspected

12. M. Cozzolino, et al. (2010):

Numerous other risk factors involved in the pathogenesis of CVD in dialysis patients are not included in this review. Considering the high burden that CVD has in HD patients, additional studies are needed to improve the treatment of this condition. CVD is very common in HD patients and causes a high risk of mortality. There are a lot of non-traditional factors that contribute to worsen this condition. A better understanding of these through clinical and experimental studies is necessary to try to improve life in HD patients and to reduce their elevated risk of CV morbidity and mortality.

13. Marisa B and Amit X. G (2018): carried out a Province-wide, Cross-sectional Study of Demographics and Medication Use of Patients in Hemodialysis Units Across Ontario : A total of 3094 patients on chronic in-center hemodialysis received a study drug of interest (age: 76.5 years [SD: 7.3]), 44% women). Patients were dispensed 11 (8, 14) unique medication products with more than two-thirds of patients dispensed 9 or more different medications. The median number of annual health care visits was 7 (3-15) with more than half the cohort receiving prescriptions from 3 or more specialists. The 10 most commonly dispensed study medications cost more than 3 million dollars in direct costs in 1 year.

14. Masahiko T, Shuichi T (2015): carried out a cross-sectional study on Analysis of drug prescription in chronic HDs patients. The clinical demographics of 850 chronic HD

patients in seven dialysis units were obtained. Compared with the mean number of medications prescribed in ambulatory patients treated in general practice reported from Ministry of Health and Welfare of Japan (2.7 (ns20 716)), the mean number medications in HD patients was larger (7.2 (ns850)). The three most prescribed drug types in HD patients were those related to calcium and phosphate metabolism (88%), antihypertensive agents (71%), and erythropoietin (60%). Among the 850 patients, 38 died during the 13-month follow-up period. The number of medications was positively associated with mortality after adjusting for age, sex, and other clinical factors: the hazard ratio was 1.14 (95% confidence interval 1.03–1.26, Ps0.007). A multiple linear regression analysis using the number of medications as a dependent factor and sex and other clinical characteristics as independent factors revealed that male sex (Ps0.04), diabetes mellitus (P-0.0001), and duplication of were positively correlated with the number of medications.

15. Inge R.F. van Berlo-van de Laar , et al. (2009) :Pharmacists suggested 422 interventions concerning drug or dose selection for 115 patients; 106 interventions were accepted by the nephrologist, which resulted in 60 patients having medication changed. Ninety percent of those changes remained implemented on follow-up after at least 1 month. In 46 (37%) patients, the clinical pharmacist detected DRPs concerning the drug use process and performed patient counselling. The average time investment was 85 min per patient for the clinical pharmacist and 15 min for the nephrologist. Time constraints and unclear responsibility due to multiple prescribers were major barriers, leading to rejection of pharmacist interventions; however, workflow efficiency must be improved before implementation.

16. Harold J. Manley^{1,2}, Cory G. Garvin , et al. (2008) :There were 128 477 medication orders categorized in 10 474 patients. DCI patient demographics were similar to present USRDS patients except for fewer Hispanics (P<0.001). Patients were

prescribed 12.3 ± 5.0 (median 12) different medications (2.6 ± 1.4 clinic medications and 10.0 ± 4.5 home medications). This is higher than reported by USRDS (median 9 medications). Patient age did not influence number of medications used ($P = 0.54$). DM patients are prescribed more medications than non-DM (13.3 ± 5.0 DM vs 11.6 ± 4.8 non-DM; $P < 0.00001$). All medication class prescribing patterns were markedly different. The data suggest that medication prescribing patterns in HD patients have changed. The audit identified appropriate and questionable prescribing patterns. Prescribing patterns indicated areas for improvement in care and highlighted the need for further investigation of certain medications.

17. H. Syed Marghoob , k. Himanshu Devender ,et.al (2001): Most common group of complications found in the study was patient-related complications (63%) and among that hypotension (26.8%) is the commonest followed by headache (25.1%) and hypertension (24.7%), frequency of vascular access-related complications (4.4%) and technical complications (3.1%) was very low.

18. J. Maria , R. Anjitha , et.al (2012): A total of 124 patients met the inclusion criteria and were recruited for the study, however, two patients passed away during the study period and one went for transplantation thus excluded. Therefore, a total of 121 patients were enrolled in the study. The mean age of the study population was 62.14 ± 11.41 years, with male patients dominating with 73%. On observing years on dialysis, it was observed that 62.8% of patients are doing dialysis in between one and five years and 74% of patients doing dialysis twice a week. The dominating comorbidity was hypertension (HTN) and diabetes (52.89%) followed by HTN (29.75%) and diabetes (9.09%).

19. Habas, A. Rayani ,et.al (2014) : Vomiting is the commonest complication and low RBS. Hotness and hypotension were not also uncommon. Early start of HD, better control of dialysate temperature, strict infection control, and regular vital signs on short time basis and using glucose

containing dialysate solutions are major issues to minimize these acute HD complications.

20. Marisa 1,2, J Racquel, et.al (2018) : It is frequent in-center haemodialysis patients. To decrease polypharmacy and its associated negative outcomes, health care providers need to implement tools to optimize medication use and deprescribe medications that lack evidence for efficacy and safety in hemodialysis patients. Therefore strategies to improve prescribing and discontinue ineffective medications warrant testing for better patient outcomes and reduced health care costs.

METHODOLOGY:

Plan of the study included

Duration: The research was carried out over a six-month timeframe, specifically from March to August 2022.

Study Design: This was a prospective educational interventional study.

Study Site: The study was conducted in selected dialysis units located in Kalaburagi.

Source of Data: Data was sourced from patient case sheets, medical records, and laboratory reports.

Ethical Considerations: - The Study protocol was approved by the Institutional Review Board of Rajive's Memorial Education Society's College of Pharmacy, Kalaburagi (**Approval NO.: RME/COP/IRB 003/ PP/2021-2022, dated 28/11/2022**)

Inclusion criteria:

- Patients receiving dialysis, regardless of gender.
- Patients who are 18 years of age and older receiving dialysis.
- Patients who consented to participate in the study.

Exclusion criteria:

- Patients who declined to participate in the study.
- Pregnant women and those who are breastfeeding.

Study procedure: A prospective interventional study was performed in specific dialysis units in Kalaburagi to evaluate the suitability of prescriptions and offer patient education about their health

conditions, medications, and potential complications associated with dialysis. Following approval from the Institutional Review Board (IRB) and obtaining permissions from the chosen dialysis centers, the study commenced. The research spanned six months, during which data from 107 patient cases were gathered. Patients were recruited for the study in accordance with the established inclusion and exclusion criteria after receiving written informed consent.

RESULTS:

Data were compiled using a custom-designed data collection form that encompassed demographic information, diagnoses, length of hospital stays, dialysis frequency, and medication records. The appropriateness of each patient's prescriptions was examined using the guidelines established by the National Kidney Foundation–Kidney Disease Outcomes Quality Initiative (NKF–KDOQI). All acquired data were subsequently input into Microsoft Excel for later analysis.

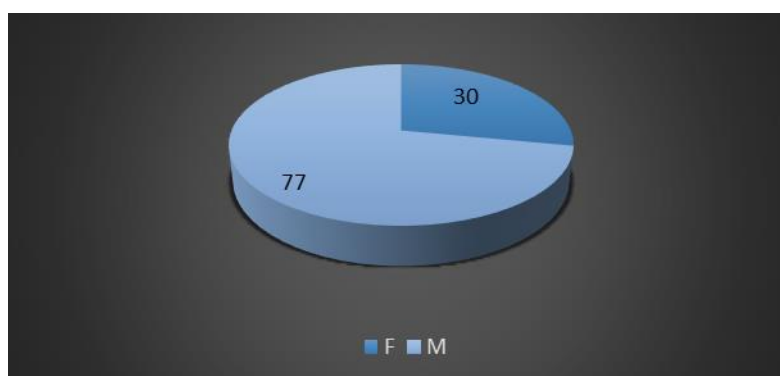


Fig No. 1: Figure depicting gender wise distribution of dialysis patients

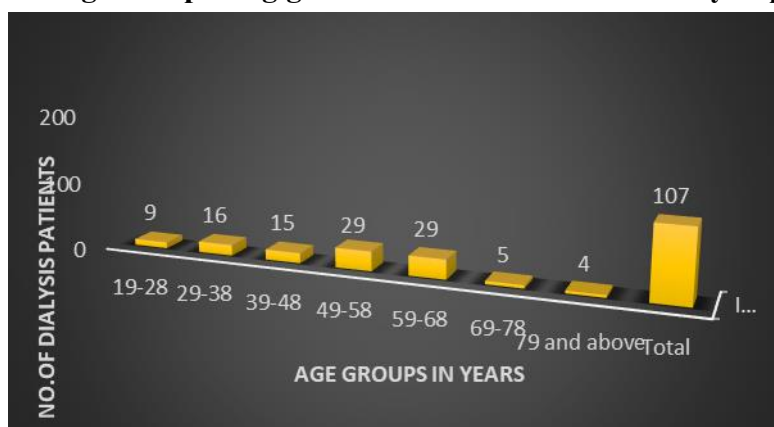


Fig No. 2: Graphical representation of age wise distribution of dialysis patients.



Fig No. 3: Graphical representation of occupation wise distribution of dialysis patients.

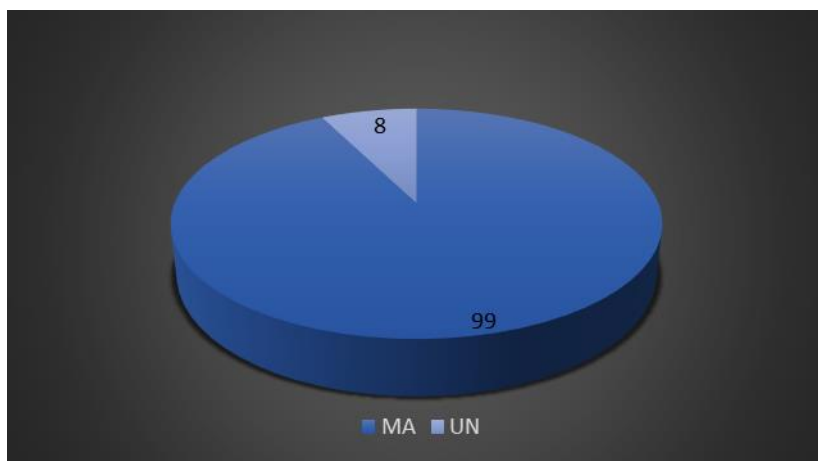


Fig No. 4: Graphical representation of marital status wise distribution of dialysis patients.



Fig No. 5: Graphical representation of social history wise distribution of dialysis patients.

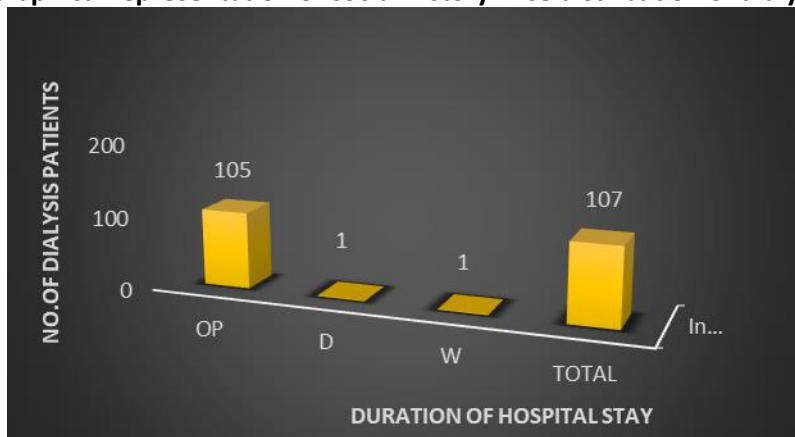


Fig No. 6: Graphical representation of duration of hospital stay wise distribution of dialysis patients

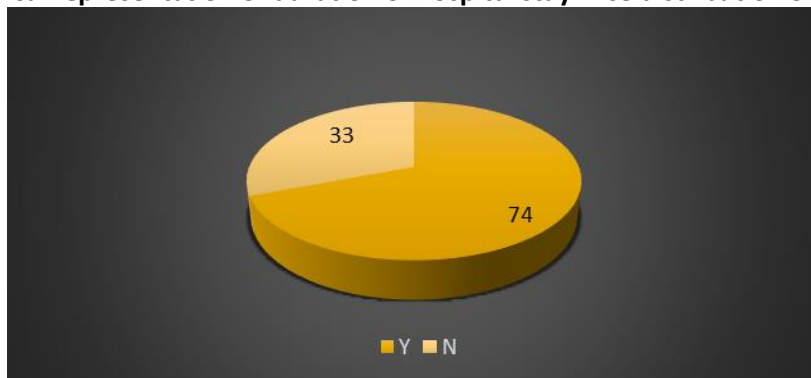


Fig No. 7: Graphical representation of answer for the question "are there any complications preceding dialysis in dialysis patients."

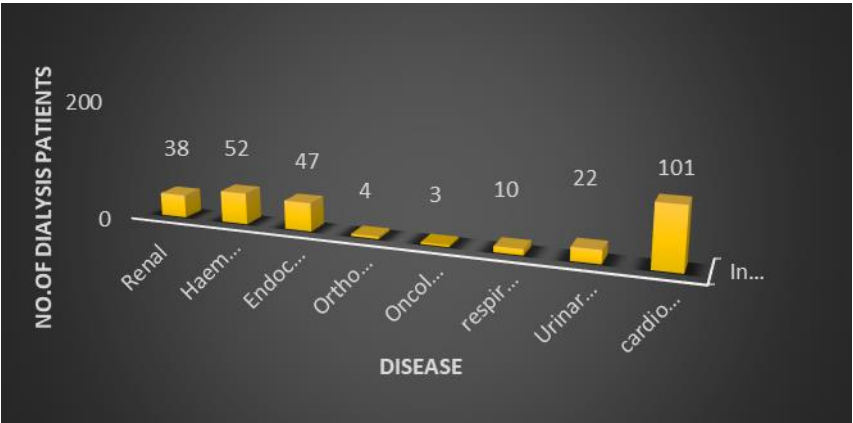


Fig No. 8: Graphical representation of co-morbidities in (ESRD) dialysis patient

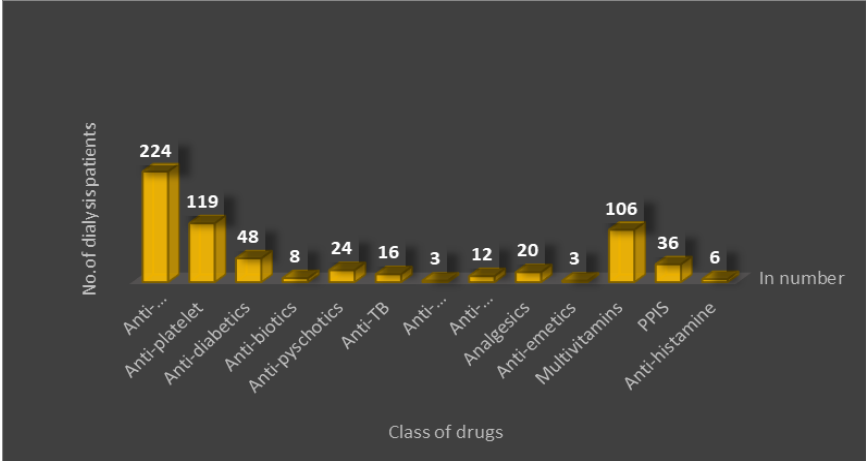


Fig No. 9: Graphical representation of drugs used in dialysis patients.

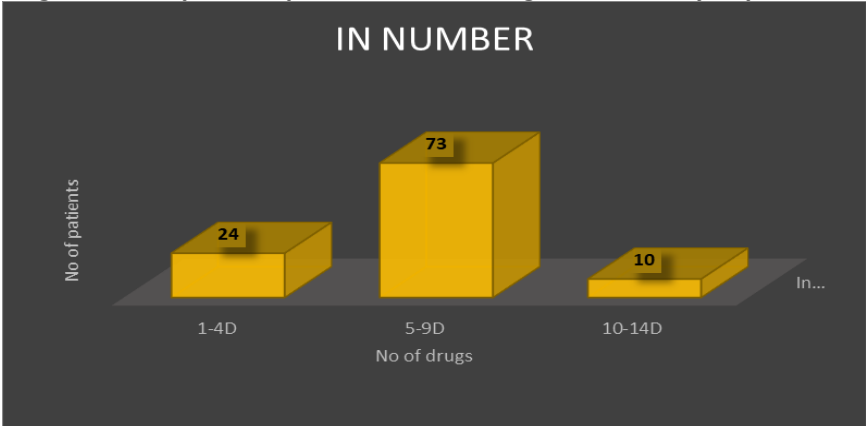


Fig No. 10: Graphical representation of NOD used in dialysis patients.

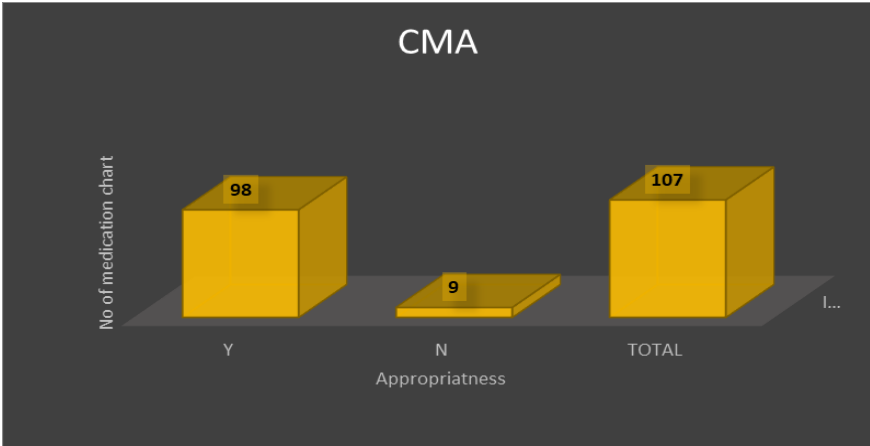


Fig No. 11: Graphical representation of CMA of drugs used in dialysis patients

Among 107 participants, a maximum number of dialysis patients 77(71.9%) were male followed by 30(28.1%) of dialysis patients were female.

Table No. 2: Table depicting gender wise distribution of dialysis patients.

S. No	Gender	In number	In percentage
1	F	30	28.1
2	M	77	71.9
	TOTAL	107	100
	Mean SD	10.32±0.12	

Table No. 3: Table depicting age-wise distribution of dialysis patients.

S.No	Age groups	In number	In percentage
1	19-28	9	8.4
2	29-38	16	15
3	39-48	15	14
4	49-58	29	27
5	59-68	29	27
6	69-78	5	4.6
7	79 -89	4	4
	Total	107	100
	Mean SD	15.16±0.4	

Table No. 4: Table depicting occupation wise distribution of dialysis patients.

S.No	Occupation	In number	In percentage
1	BS	36	33.6
2	DV	6	5.6
3	ST	9	8.41
4	FAR	14	13.08
5	HW	20	18.6
6	PO	3	2.8
7	N	19	18
	Total	107	100

Table No. 5: Table depicting marital status wise distribution of dialysis patients.

S.No.	Marital status	In number	In percentage
1	MA	99	92.5
2	UN	8	7.5
	TOTAL	107	100
	Mean SD	6.2±0.2	

Table No. 6: Table depicting social history wise distribution of dialysis patients.

S. No	Social history	In number	In percentage
1	N	58	54.2
2	Y-TC	17	15.8
3	Y-TS	15	14
4	Y-ALC	1	1
5	Y-TS,TC	5	4.6
6	Y-TC,ALC	3	2.8
7	Y-TS,ALC	2	1.8
8	Y-TC,TS, ALC	6	5.8
	TOTAL	107	100

Table No. 7: Table depicting duration of hospital stay wise distribution of dialysis patients.

S.No	DOHS	In number	In percentage
1	OP	105	98
2	D	1	1
3	W	1	1
	TOTAL	107	100

Table No. 8: Table depicting answer for the question “are there any complications preceding dialysis in dialysis patients.

S.No	CPD	In number	In percentage
1	Y	74	70
2	N	33	30
	TOTAL	107	100
	Mean SD	7.84±0.15	

Table No. 9: Table depicting co-morbidities in (ESRD) dialysis patients.

S. No	Disease	In number	In percentage
1	Renal	38	13.7
2	Haematological	52	18.77
3	Endocrine	47	16.96
4	Orthopaedic	4	1.44
5	Oncologic	3	1.08
6	respiratory	10	3.61
7	Urinary tract	22	7.94
8	cardiovascular	101	36.5
	TOTAL	277	100

Table No. 10: Table depicting drugs used in dialysis patients

S.No	Drugs	In number	In percentage
1	Anti-hypertensives	224	35.8
2	Anti-platelet	119	19.04
3	Anti-diabetics	48	7.88
4	Anti-biotics	8	1.38
5	Anti-psychotics	24	3.84
6	Anti-TB	16	3.56
7	Anti-hypotensive	3	0.48
8	Anti-hyperlipidaemics	12	1.92
9	Analgesics	20	3.20
10	Anti-emetics	3	0.48
11	Multivitamins	106	16.9
12	PPIS	36	5.7
13	Anti-histamine	6	0.9

Table 11: Table depicting NOD used in dialysis patients.

S. No.	NOD	In number	In percentage
1	1-4D	24	22.5
2	5-9D	73	68.2
3	10-14D	10	9.3
	TOTAL	107	
	Mean SD	6.7±0.3	

Table 12: Table depicting CMA of drugs in dialysis patients.

S. No.	CMA	In number	In percentage
1	Y	98	91.5
2	N	9	8.5
	TOTAL	107	100%
	MeanSD	3.3±0.03	

DISCUSSION:**Limitations of the Study:**

- The Study was conducted in a limited number of dialysis units in Kalaburagi, which may not represent all settings.
- The sample size was relatively small, limiting the generalizability of the findings.
- The Study was cross-sectional, so causality cannot be established.
- Data were collected using self-reported or observed methods, which may be subject to response bias.
- Time & resource constraints restricted the inclusion of follow-up assessments.

CONCLUSION:

The current research determined that the majority of the evaluated prescriptions were suitable, while only a small number (n = 9) were identified as unsuitable. Haemodialysis emerged as the predominant form of dialysis prescribed, primarily owing to increased attendance in outpatient settings. The research highlighted the necessity for dialysis patients to receive comprehensive guidance concerning their illness, medications, and the dialysis procedure, as numerous patients possessed insufficient knowledge about medication adherence, contraindications during end-stage renal disease (ESRD), and necessary lifestyle changes. A significant number of medications (ranging from 5 to 19) were noted, and instances of non-adherence were prevalent, underscoring the importance of integrating clinical pharmacists into patient care. In summary, the results underscore the crucial function of pharmacist-led initiatives in enhancing medication adherence, averting drug-related issues, and optimising therapeutic results for patients undergoing dialysis.

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