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Medication Adherence in Renal Patients

J. Anoohya [a], U. Sameera [a], Ravi Chander Thatipelli [a] and Tejaswi Chillara [a*]

[a] *Department of Pharmacy Practice, Vaagdevi Pharmacy College, Bollikunta, Warangal, Telangana, India.*

Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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Original Research Article

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ABSTRACT

Background: Medication adherence is defined as extent of patients taking medications as prescribed by doctors. It is the major factor that determines the therapeutic outcomes in the patient. Non adherence is quite common problem in most of the patients which is dangerous and can increase treatment expenses.
Aims: The study was conducted to evaluate and identify various reasons leading to non-adherence which can result in unpleasant consequences in the renal patients.
Materials and Methods: The study was a prospective observational study that was performed through a questionnaire for 6 months. The data collected includes renal patient's demographic details, past history, complaints, medications and interviewed them regarding their medications use by using morisky adherence questionnaire.
Results: The study was performed on 300 renal patients in the nephrology department. From this data around 31(10%) of the patients were completely adherent and 269(90%) of the patients were non-adherent to the medications. 66(24%) were non-adherent due to forgetfulness about medications, 49(18.2%) were non-adherent because of very frequent changes made in the drug regimen, 63(23.4%) of the patients were non-adherent because of expensive medicines.

**Corresponding author: E-mail: tejaswi.chillara23@gmail.com;*

Conclusion: In our study, we observed that most of the people are unaware of their own medical condition and about their medications use. We assessed that lack of knowledge on renal complications and purpose of medication adherence will cause the non-medication adherence in the renal patients. So, the health care professionals must educate the patients regarding their severity of their health condition, usage and importance of their prescribed medications and advantages of hemodialysis in CKD patients, dietary restrictions to improve their quality of life and to reduce mortality rate. Non adherence can be also a result of low economic status.

Keywords: Medication adherence; Morisky adherence questionnaire; CKD.

ABBREVIATIONS

CKD- Chronic Kidney Disease, AKI- Acute Kidney Injury, MHD- Maintenance Hemodialysis.

1. INTRODUCTION

Medication adherence is defined by the World Health Organization as "the degree to which the person's behavior corresponds with the agreed recommendations from a health care provider. Medication adherence usually refers to whether patients take their medications as prescribed (e.g, twice daily), as well as whether they continue to take a prescribed medication. Medication nonadherence is a growing concern to clinicians, healthcare systems, and other stakeholders because of mounting evidence that it is prevalent and associated with adverse outcomes and higher costs of care [1,2]. Taking your medicine as prescribed or medication adherence is important for controlling chronic conditions, treating temporary conditions, and overall long-term health and well-being [3]. There are many causes of nonadherence but they fall into two overlapping categories: intentional and unintentional. Intentional nonadherence occurs when the patient decides not to follow the treatment recommendations [4].

These are Eight Common Reasons for Intentional Nonadherence.

Fear, Cost, Misunderstanding, too many medications, Lack of symptoms, Mistrust, Worry, Depression.

1.1 Renal System

The overall function of the system filters approximately 200 liters of fluid a day from renal blood flow which allows for toxins, metabolic waste products, and excess ion to be excreted while keeping essential substances in the blood. Types of renal diseases include: Chronic kidney disease (CKD) [5], Acute kidney injury (AKI), Polycystic kidney disease (PKD), Pyelonephritis, End Stage Renal Disease (ESRD) [6], Nephrotic syndrome, Hydronephrosis, Renal calculi [7,8,9,10].

CKD is a condition in which the kidneys are damaged and cannot filter blood because of this, excess fluid and waste from blood remain in the body and may cause other health problems, such as heart disease and stroke [4,11,12].

- The normal values of creatinine by gender: 0.7 to 1.3 mg/dL for adult males. 0.5 to 1.1 mg/dL for adult females. High creatinine levels may indicate several underlying health conditions including kidney infection and kidney failure. Creatinine is a waste product of the muscles. In a healthy body, the kidneys filter creatinine from the blood and excrete it through the urine. High levels of creatinine can indicate kidney issues [1,5].
- The normal BUN level is between about 7 to 20 (mg/dL). Unless this level is greater than 60 mg/dL, it may not help your healthcare provider measure your kidney health. A better measure is the ratio of BUN to creatinine found in your blood [5].

2. METHODOLOGY

2.1 Materials and Methods

The study was a prospective observational study that was performed through a questionnaire for 6 months in 300 renal patients. The data collected includes patient's demographic details, past history, complaints, medications and interviewed them regarding their medications use by using Morisky Medication Adherence Scale 8- Item. Inclusion criteria include patients undergoing hemodialysis, Patients above 18 years of age, Patients diagnosed as CKD, AKI and other renal diseases. Exclusion criteria include children and patients diagnosed with diseases other than renal department. Depending on the adherence scale scores, patients have been categorized into 3 divisions: Low medication adherence (0-5), Moderate medication adherence (6-7), High

medication adherence (8) and we also collected the data regarding the causes which are resulting in the non-medication adherence.

3. RESULTS

According to Fig. 1, out of 300 patients, 1 patient was between 18-20years of age (0.3%), 32 patients were between 21-30 age (10%), 56 patients were between 31-40 age (18%), 56 patients were between 41-50(18%), 77 patients were between51-60 age (25%) ,61 patients were under the age of 61-70 age (20%), 15 patients were under the age of 71-80 age(5%), 2 patients were under the age of 81+ (0.6%).

According to Fig. 2 it represents the area wise distribution chart .out of 300 patients 121(40.3%) belong to rural population and 179(59.6%) belong to urban population.

According to Fig. 3 it shows population chart. Out of 300 members in the study, male patients were 207(68%) member, female patients were 93(32%) members.

Table 1. Age wise distribution of patients

Age	Population
18-20	1
21-30	32
31-40	56
41-50	56
51-60	77
61-70	61
71-80	15
81+	2

Table 2. Area wise distribution of patients

Area	Population
Rural	121
Urban	179

Table 3. Gender wise population

Gender	Population
Male	207
Female	93

According to Fig. 4 it shows distribution of disease. Out of 300 patients 35(11.6%), patients have AKI, 97(32.3%), patients have CKD ,116(38.6%), patients have CKD ON MHD .5(1.6%), patients have pyelonephritis, 25(8.3%), patients have ESRD ON MHD,6(2%) patients have Nephrotic syndrome and 11(3.6%). patients have other disease conditions.

According to Fig. 5 it shows occupation chart. Out of 300 patients 10(3.3%) patients were farmers, 30(10%), patients were retired employees, 37(12.3%), patients were business people, 25(8.3%), patients were teachers,45(15%)patients were house wives, 16(5.3%)patients were students, 6(2%)patients were drivers, 30(10%)patients were software employees, 38(12.6%) patients were private employees, 6(2%), patients were workers, others are employees 57(19%).

Table 4. Disease wise distribution of patients

Disease	Population
AKI	35
CKD	97
CKD on MHD	116
Kidney failure	5
Pyelonephritis	5
ESRD on MHD	25
Nephrotic Syndrome	6
Other Diseases	11

Table 5. Occupation wise distribution of population

Occupation	Population
Farmer	10
Retired employee	30
Business	37
Teacher	25
House wife	45
Student	16
Driver	6
Software	30
PVT employee	38
Worker	6
Other	57

Table 6. Adherence wise population

Non-adherence	269
Adherence	31

Table 7. Gender wise distribution of adherent population

Gender	Adherence population
Male	23
Female	8

Table 8. Gender wise distribution of non-adherent patients

Gender	Non-adherence population
Male	184
Female	85

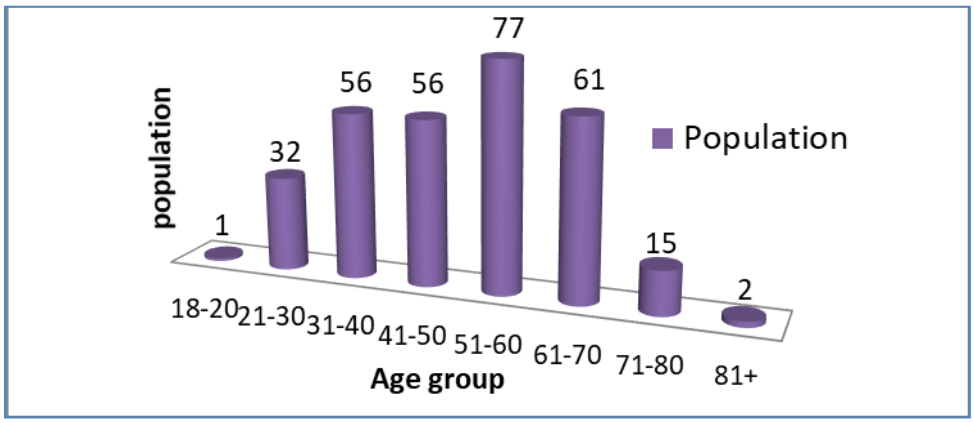

Fig. 1. Age wise distribution of patients

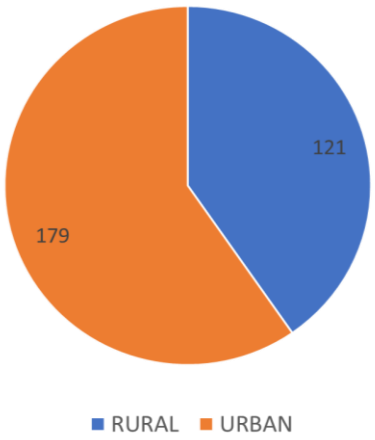

Fig. 2. Area wise distribution

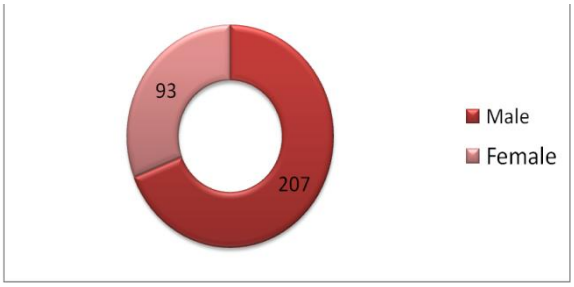

Fig. 3. Gender wise population

According to Fig. 6 it represents adherence wise distribution chart. Out of 300 patients 269(89.6%) patients were non-adherent and 31(10.9%) patients were adherent.

According to Fig. 7 it is medication adherence - gender wise distribution graph .out of 300 patients 23(75%) were male patients and 8(25%) patients were female patients.

According to Fig. 8 it is non-adherence gender wise distribution chart. Out 300 patients 184 (68.4%) patients were non-adherent in male and 85 (31.5%).

Table 9. Causes of non adherence

Causes	Population
Complex regimen	55
Fear of hospitals	25
Forgetfulness	56
Frequent changes in regimen	45
High cost	58
Poor economic status	30

Table 10. Adherence scores of populations

Adherence Scale	Score	Population
LOW (01)	1	89
LOW (02)	2	88
LOW (03)	3	60
LOW (04)	4	21
LOW (05)	5	5
MEDIUM	6	4
MEDIUM	7	2
HIGH	8	31

According to Fig. 9 it is causes of non-adherence chart .out of 300 members 55(20.4%) patients were having complex regimen has cause 25(9.2%), patients have fear of hospitals 56(20.8%), patients have forgetfulness 45(16.7%), patients had frequent changes in regimen 58(21.5%) patients have high cost and 30(11.1%) patients are due to poor economic status.

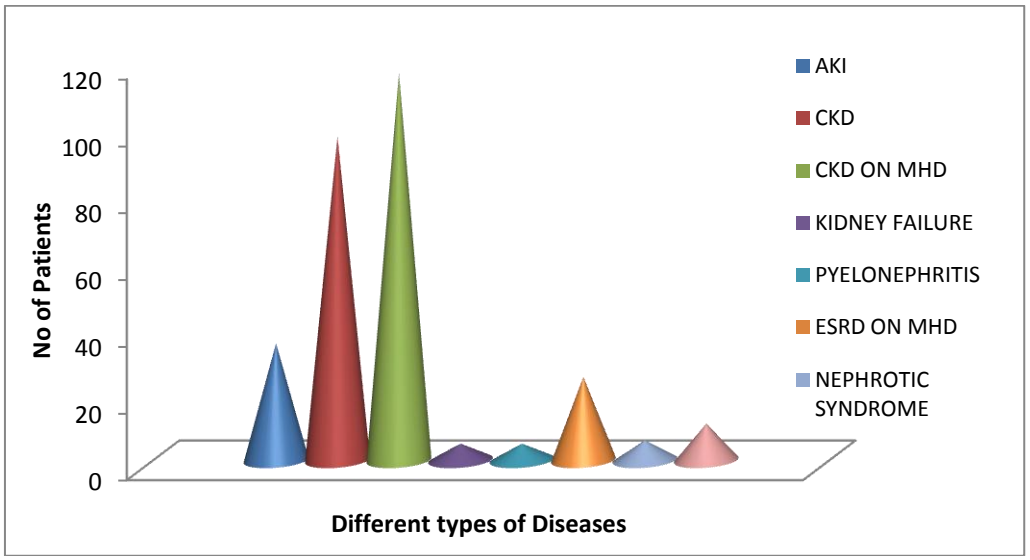

Fig. 4. Disease wise distribution of patients

According to Fig. 10 it represents the adherence score. Out of 300 patients 258 (87.6%), members are having low adherence rate6 (2%) members are having moderate adherence level and 31 (10.3%). members are having high adherence level.

Table 11. Disease- adherence wise population

Disease Adherence	Population
AKI	7
CKD	7
CKD on MHD	13
Kidney failure	1
Pyelonephritis	0
ESRD on MHD	2
Nephrotic syndrome	1
Other diseases	0

Table 12. Disease- non adherence wise population

Disease non-adherence	Population
AKI	28
CKD	90
CKD on MHD	103
Kidney failure	4
Pyelonephritis	5
ESRD on MHD	23
Nephrotic syndrome	5
Other diseases	11

According to Fig. 11 it represents the disease adherence score. out of 300 7 (22.5%) people are having AKI,7 (22.5%) people are having CKD,13(41.9) people are having CKD ON MHD,1(3.2%) people are having Kidney failure,2(6.45%) are having ESRD and 1(3.29%) are having nephrotic syndrome.

According to Fig. 12 it represents the non-adherence of the disease. Out of 300 patients 28(10.4%) patients are having AKI,90(33.4%) patients are having CKD ,103 (38.2%) patients are having CKD ON MHD, Complications in non-adherent patients 4 (1.4%) patients are having Kidney failure,5 (1.8%) patients are having pyelonephritis, 23(8.5%) patients are having ESRD ON MHD, 5 (1.8%) patients are having nephrotic syndrome and 11 (10%) patients are having other disease condition.

Table 13. Complications Progressed in patients

Disease	Number of patients	No. of patient's complications observed
AKI	35	11
CKD	97	18
CKD on MHD	116	34
Kidney failure	5	2
Pyelonephritis	5	1
ESRD	25	6
Nephrotic syndrome	6	2
Others	11	1

4. DISCUSSION

The study was performed on 300 patients in the renal department undergoing hemodialysis and

treatment for CKD, AKI, PKD etc., based on our inclusion criteria and their data was collected through morisky questionnaire. Hypertension and diabetes are the main leading causes for the renal damage in the patients. Most of the patients have hypertension and diabetes in their past medical history. It has been concluded that 199(66.3 %) of the patients have hypertension in their past history and 44(14.6 %) of the patients have diabetes and 57(18%) of the patients have other comorbidities like thyroid, known history of CKD [13]. Adherence is the main reason which brings out positive outcomes in a patient. Non-medication adherence is the primary concern which can result in advancing of the decease to chronic condition. Among 269 non adherent patients, 6 members had died due to their negligence. we have evaluated that most of the CKD patients were non adherent due to forgetfulness about the medications as there are multiple medications prescribes to them.

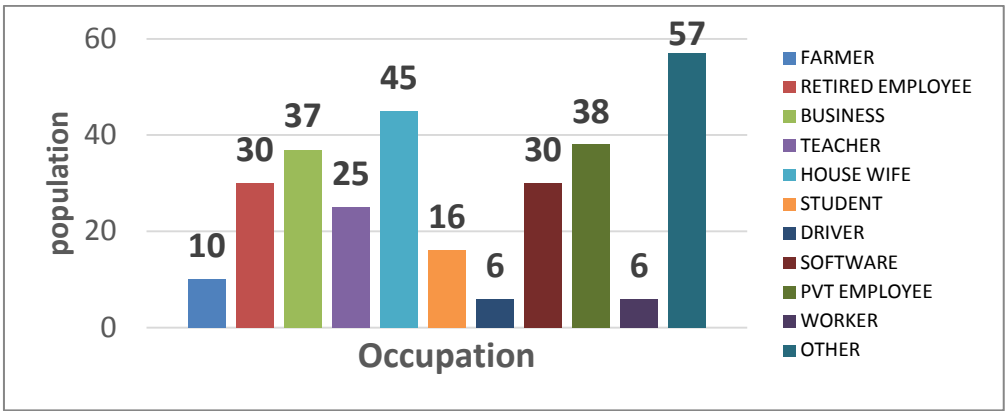

Fig. 5. Occupation wise distribution of population

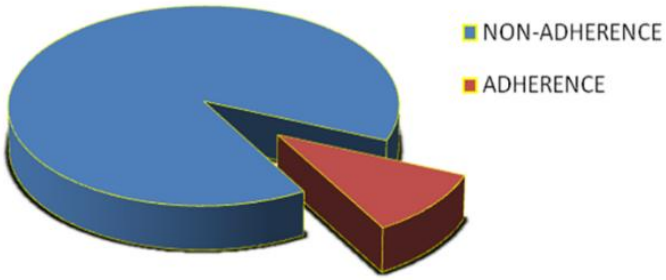

Fig. 6. Adherence wise population

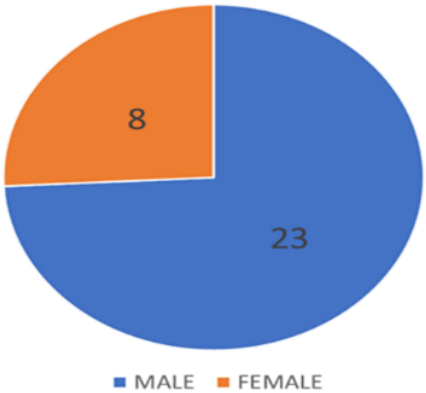

Fig. 7. Gender wise distribution of adherent population

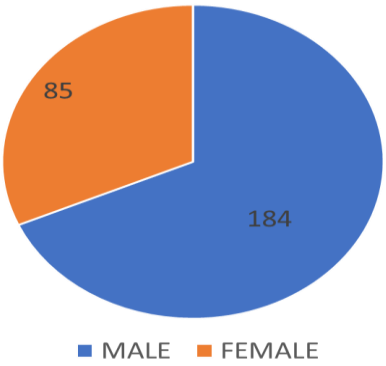

Fig. 8. Gender wise distribution of non-adherent patients

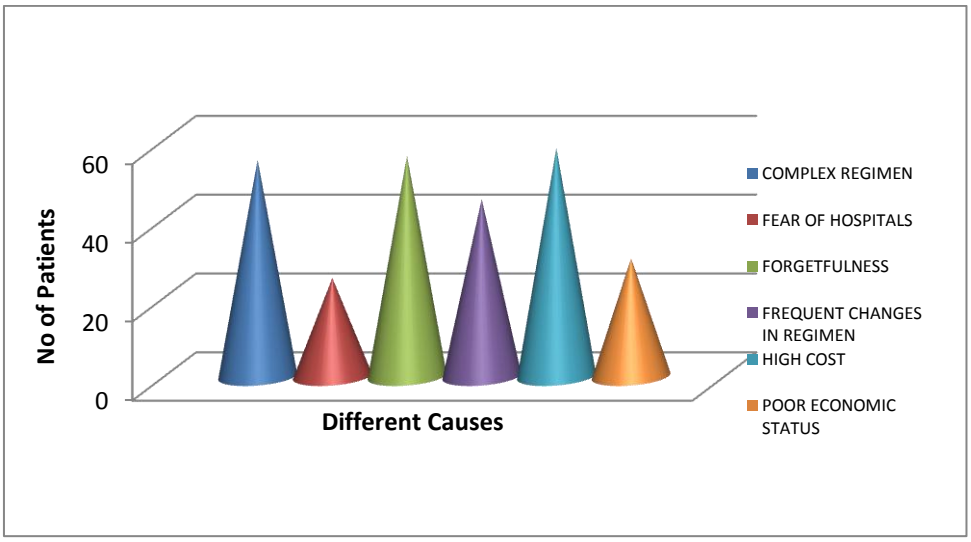

Fig. 9. Causes of non adherence

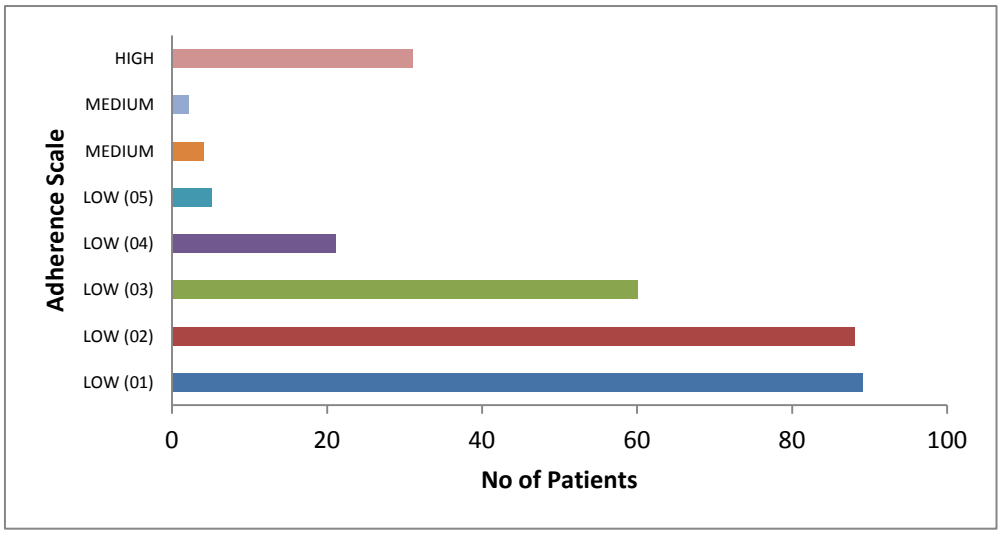

Fig. 10. Adherence scores of populations

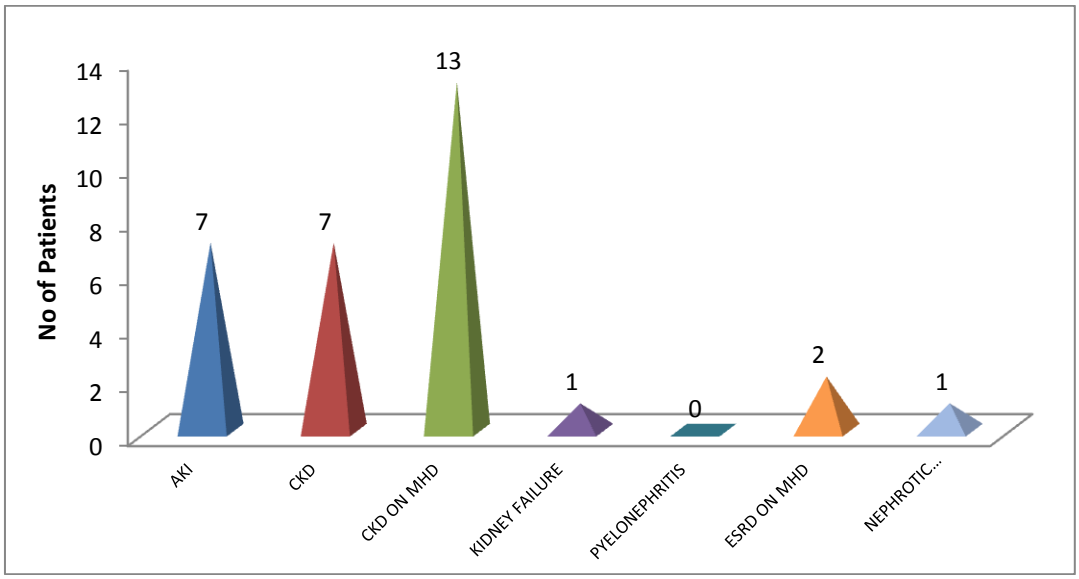

Fig. 11 Disease- adherence wise population

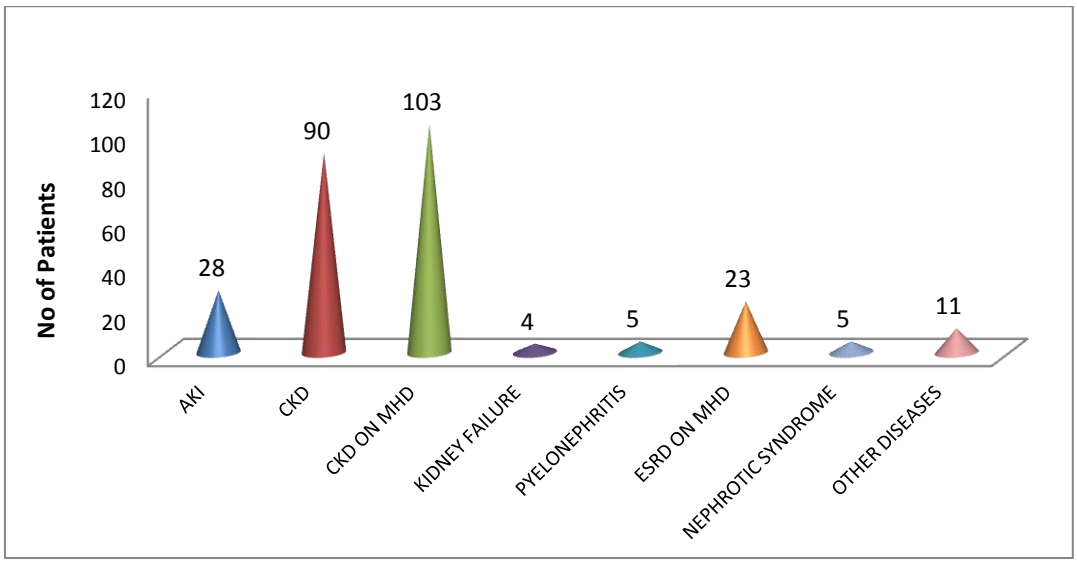

Fig. 12. Disease- non adherence wise population

5. CONCLUSION

Medication non-adherence in the patients has been a major concern in the health care system. According to our study we concluded that medication non-adherent renal patients were high when compared to medication adherent renal patients. It is due to high cost of the treatment, complex regimen (polypharmacy), repeated hospital visits, fear of hospitals and long-term hospital stay. The non-adherence of the medications causes the complications in renal patients and increases the renal mortality rate. We assessed that lack of knowledge on renal complications and purpose of medication adherence will cause the non-medication adherence in Warangal region. In our study, we have observed that most of the people are unaware of their own medical condition and about their medications use. So, the health care professionals must educate the patients regarding their severity of their health condition, usage and importance of their prescribed medications and advantages of hemodialysis in CKD patients, dietary restrictions to improve their quality of life and to reduce mortality rate. They also need to arrange few awareness programs regarding medication adherence, tips

to improve proper adherence to the medications.

CONSENT

As per international standard or university standard, patient(s) written consent has been collected and preserved by the author(s).

ETHICAL APPROVAL

It is not applicable.

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COMPETING INTERESTS

Authors have declared that no competing interests exist.

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