**Research  article**                                                                   **Hospital research**

# Assessment of risk factors and medication adherence of chronic kidney disease patients in a tertiary care teaching hospital

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## ABSTRACT

Chronic Kidney Disease (CKD), also known as chronic renal disease, is the progressive, irreversible deterioration of renal function.

**Objective**

The main objective of this study was to assess the risk factors and medication adherence for CKD patients in rural tertiary care teaching hospital by using risk assessment form and morisky medication adherence questionnaire form respectively.

**Methods**

These forms contain closed ended questionnaires. It is a prospective observational study conducted over a period of six months.

**Results**

In this study 300 subjects consisting of 188 (62.7%) men and 112(37.3%) women had chronic kidney disease. In this study Age, gender, BMI, Family history, Smoking and Alcoholic were observed for risk factor assessment and morisky medication adherence scale is used to assess adherence of the patient towards medication. In CKD patients, age is a major risk factor, in which more number of patients of age 41-50 years were 92 (30.7%) found. Commonly seen risk factors were age, gender, BMI, and family history. More no. of patients were highly adherent to their medication i.e., 51.3%.

**Conclusion**

By this study we concluded that more number of male CKD patients were exposed to risk factors than female and more patients are highly adherent to their medication.

**Keywords:** Chronic kidney disease, Risk factors, Medication adherence.

## INTRODUCTION

Risk factor refers to an attribute or characteristic or exposure of an individual whose presence or absence raises the probability of an adverse health outcome[1]. Medication adherence[2] is defined as extent to which a patient's medication taking behaviour coincides with the intention of the health advice he or she has been given. Medication adherence is one of the important factors that determine therapeutic outcomes, especially in patients suffering from chronic illness. Currently non-communicable diseases, such as Diabetes, Asthma, COPD, Hypertension and Heart Disease are rapidly replacing infectious diseases. While mortality due to communicable diseases is decreasing, that for non-communicable diseases like chronic disease is rising at a very rapid pace. Chronic diseases are the leading cause of death in both males and females in all WHO regions. Approximately 72% of all chronic diseases occur in

people aged 30 years and older. The causes of the main chronic diseases were risk factors. Some risk factors can be modified, other can't be modified. The modifiable factors include smoking, hypertension, elevated serum cholesterol, physical activity, obesity. The unmodifiable risk factors such as age, gender, race, family history and genetic factors[3]. Medication adherence is an important factor that determines therapeutic illness, various factors associated with the medication adherence are age, gender, annual income, education and social habits. CKD has been classified as stages I to V to denote the severity of renal impairment. Stage I is defined as kidney damage with a normal or increased GFR ($>90$mL/min/1.73 m$^2$). Stage II is defined as kidney damage or mildly decreased GFR (60 to 89 mL/min/1.73 m$^2$). Stage III signifies moderate reductions in GFR (30 to 59 mL/min/1.73 m$^2$). Stage IV can denote a GFR of 15 to 29 mL/min/1.73 m$^{2.}$ Stage V is kidney failure or a GFR of $< 15$ mL/min/1.73 m$^2$ .The worlds disease profile is changing and chronic diseases now account for the majority of global morbidity and mortality, rather than infectious diseases CKD is of epidemic proportion, and its prevalence will double in next 25 years, particularly in the developing countries.

## MATERIALS AND METHODS

### Study site
The Study was conducted in the General Medicine Department of SVS MEDICAL COLLEGE HOSPITAL, MAHABUBNAGAR which is a Tertiary Care Teaching Hospital which has 900 beds with Multi Specialty Departments.

### Study design
The study was prospective observational and cross-sectional study.

### Study period
This study was conducted over a period of six months.

### Study approval
This study was approved by the ethical committee constituted by SVS Medical College Hospital, Mahabubnagar.

### Study Materials
### Materials and Source of data
☐ Weighing machine
☐ Height measuring tape

☐ **Patient consent form**- An informed consent form was prepared in both English and Telugu version for the convenience of patient's understanding.
☐ **Patient data collection form**- It contains the socio demographic details of the patients like Age, Sex, BMI, Education, Occupation, Annual income, Smoking, Alcoholic, Family history details of HTN,DM,CKD.
☐ Medication adherence questionnaire
☐ Risk factors questionnaire

### Statistical software
The Statistical software namely SAS 9.2, SPSS 15.0, Stata 10.1, MedCalc 9.0.1,Systat 12.0 and R environment ver.2.11.1 were used for the analysis of the data and Microsoft word and Excel have been used to generate graphs, tables etc**.**

### Questionnaires
### Morisky Medication Adherence Scale (MMAS) questionnaire
It is an 8 item Medication Adherence Scale of Morisky, prior permission was taken to use it before conducting the study. The MMAS is a generic self-reported, medication taking behavior scale by which patient adherence to the medication is assessed. The questionnaire was prepared in both Telugu and English version for convenience of patient's understanding and for providing information. It contains 8 questions with two options for first 7 questions and five options for 8 questions.

## STUDY PROCEDURE
This is a prospective observational study where patients eligible were enrolled into the study after obtaining the consent. The data collection form was prepared and used. This form mainly contains the demographic details of the patient. Questionnaires for risk factors and medication adherence were used to obtain the information about patient. All information relevant to the study was collected at the time of admission till the date of discharge and the data will be analyzed using suitable method for statistical analysis. Medication adherence questionnaires consist of 8 questions by which adherence behaviour of patient can be assessed. Risk factors were assessed by knowing the Age, Sex, BMI, Occupation, Annual income, Family history, Co morbidities, Alcohol and Smoking history. The patients details were collected by using the case sheet or by directly asking the patients, the questionnaires were asked to be filled by the patients and

the patient's medication adherence, risk factors are assessed by the information.

## RESULTS AND DISCUSSION

A total number of 300 patients were enrolled for the study, among those male were 188(62.7%) and female were 112(37.3) having CKD as shown in Figure 1. Where as in the study conducted by Dogan N showed that female were more 374(31.3%) compared to that of male 119(14.10%) [5].

According to the Table 1 among major six risk factors majority of the patients were having age risk factor By the collected data it is found that 41-50 years age group patients were more 92 (30.7%) as compare to remaining age groups. where as in a study conducted by Tazi MA et al. showed that 45–54 years age group patients were more 183(25.70%).

According to the Table 1 in BMI risk factor obese patients (BMI > 30 kg/m2) were 13(4.3%), over weight patients (BMI 23–30 kg/m2) were 114(38.0%), normal patients (BMI 18-23 kg/m2) were 155(51.7%) and underweight patients(BMI <18 kg/m2) were 18(6.0%). Among these normal BMI patients and overweight patients were more as compare to underweight and obese. The study conducted by Tazi MA et al. shown similar results that normal patients had 43.20% were more as compare to overweight 32.80% and obese patients 23.60% [6].

According to the Table 1 in family history risk factor 234 patients (78.0%) were with the positive family history of HTN, DM, CKD, stomach cancer i.e., 18.0%, 26.0%, 33.7%, 0.3% respectively and patients with no family history were 66(22.0%).

According to the Table 1 smokers were 74(24.7%) and 226(75.3%) were non-smokers. This study having similarities with the study conducted by Hazarika NC, in this study smokers were less 131(15.70%) as compared to the non-smokers 701(84.30%) [7].

According to the Table 1 alcoholics were 130(43.3%) and 170(56.7%) were non-alcoholics this study having similarities with the study conducted by Hazarika NC, in this study alcoholics were less 328(36.94%) as compared to the non-alcoholics 560(63.60%) [8].

**Table 1: shows characteristics of the patients considered for the assessment of Risk factors**

| BASIC VARIABLES | No. of patients | % |
|---|---|---|
| **Age (in years)** | | |
| 25-30 | 21 | 7.0 |
| 31-40 | 62 | 20.7 |
| 41-50 | 92 | 30.7 |
| 51-60 | 69 | 23.0 |
| 61-70 | 41 | 13.7 |
| 71-80 | 15 | 5.0 |
| >80 | - | - |
| **Gender** | | |
| Male | 188 | 62.7 |
| Female | 112 | 37.3 |
| **Smoking/Alcoholic** | | |
| Alcoholic | 130 | 43.3 |
| Smoker | 74 | 24.7 |
| **BMI (kg/m$^2$)** | | |
| <18.5 | 18 | 6.0 |
| 18.5-23 | 155 | 51.7 |
| 23-30 | 114 | 38.0 |
| >30 | 13 | 4.3 |

| | | |
|---|---|---|
| **Family history** | | |
| Nil | 66 | 22.0 |
| Yes | 234 | 78.0 |
| • CKD | 54 | 18.0 |
| • DM | 78 | 26.0 |
| • HTN | 101 | 33.7 |
| • Stomach Cancer | 1 | 0.3 |
| **Co-morbidities Conditions** | | |
| Absent | 91 | 30.3 |
| Present | 209 | 69.7 |
| **TOTAL** | **300** | **100.0** |

Assessment of medication adherence is worked out based on the responses provide by the patients for the Morisky medication adherence questionnaires. The responses provided by the patients are analyzed and reported in the Table 2 and the results are drawn from it and presented in Table 3. According to that among 300 patients 154(51.3%) were highly adherent, 89(29.7%) were medium adherent and 57(19.0%) were low adherent to their medications.

A Cross sectional study was conducted to analyze the medication adherence with respect to age, gender, education, income, and social habits.

According to Table 4 the highly adherent behaviour of patients with different age groups of 25-30, 31-40, 41-50, 51-60, 61-70, and 71-80 are 6.5%, 17.5%, 32.5%, 23.4%, 14.3%, and 5.8% respectively.

According to Table 4, 62.3% of the male patients and 37.7% of the female patients are highly adherent.
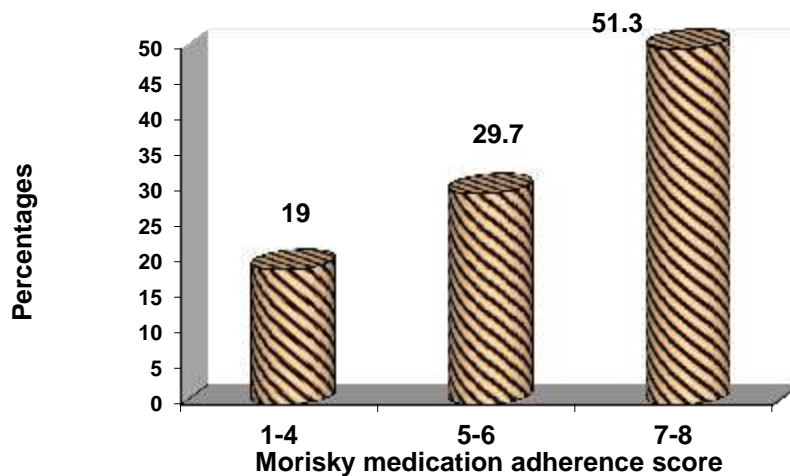


According to Table 4, the highly adherent behaviour of illiterates, primary educated, secondary educated and graduates are 35.7%, 9.7%, 34.4% and 20.1% respectively.

According to Table 4, the highly adherent behaviour of patients with the income groups <25000, 25000-50000, 50000-100000, and >100000 are 27.3%, 22.7%, 29.2%, and 20.8% respectively.

According to Table 4, the highly adherent behaviour of alcoholic patients and non- alcoholic patients are 48.1% and 51.9% respectively.

According to Table 4, the highly adherent behaviour of smokers and non- smokers are 18.8% and 81.2% respectively.

**Table 2:** Questionnaire analysis

| Questions | Response | |
|---|---|---|
| | yes (n=300) | no (n=300) |
| Do you sometimes forget to take your medicine? | 49(16.3%) | 251(83.7%) |
| Thinking over the past 2 weeks were there any days when you did not take your medicine? | 20(6.7%) | 280(93.3%) |
| Have you ever cut back or stopped taking your medicine without telling your doctor because you felt worse when you took? | 39(13%) | 261(87%) |
| When you travel or leave home do you sometimes forget to bring along your medicine? | 68(22.7%) | 232(77.3%) |
| Did you take all your medicine yesterday? | 237(79%) | 63(21%) |
| When you feel like your symptoms are under control do you sometimes stop taking your medicine? | 42(14%) | 258(86%) |
| Do you ever feel hassled about sticking to your treatment plan? | 95(31.7%) | 205(68.3%) |
| How often do you have difficulty remembering to take all your medicine? (no= option 'A' ; yes= option 'B-E') | 149(49.7%) | 151(50.3%) |

**Table 3: Shows the distribution of Morisky Medication Adherence Score**

| Morisky medication adherence score | No. of patients | % |
|---|---|---|
| 1-4 (low adherence) | 57 | 19.0 |
| 5-6(medium adherence) | 89 | 29.7 |
| 7-8(high adherence) | 154 | 51.3 |
| Total | 300 | 100.0 |

**Table 4: Shows the Correlation of Morisky medication adherence score according to age, gender, Education, income and social habits in CKD patients**.

| Variables | Morisky medication adherence score | | | P value |
|---|---|---|---|---|
| | Low Adherence (1-4)(n=57) | Medium Adherence (5-6)(n=89) | High Adherence (7-8)(n=154) | |
| **Age in years** | | | | |
| • 25-30 | 3(5.3%) | 8(9%) | 10(6.5%) | $\chi^2$=13.317 |
| • 31-40 | 10(17.5%) | 25(28.1%) | 27(17.5%) | P=0.207 |
| • 41-50 | 16(28.1%) | 26(29.2%) | 50(32.5%) | |
| • 51-60 | 13(22.8%) | 20(22.5%) | 36(23.4%) | |
| • 61-70 | 9(15.8%) | 10(11.2%) | 22(14.3%) | |
| • 71-80 | 6(10.5%) | 0(0%) | 9(5.8%) | |
| **Gender** | | | | |
| • Male | 34(59.6%) | 58(65.2%) | 96(62.3%) | $\chi^2$=0.467 |
| • Female | 23(40.4%) | 31(34.8%) | 58(37.7%) | P=0.792 |
| **Education** | | | | |
| • Illiterate | 13(22.8%) | 20(22.5%) | 55(35.7%) | $\chi^2$=10.704 |
| • Primary | 10(17.5%) | 16(18%) | 15(9.7%) | P=0.098+ |
| • Secondary | 24(42.1%) | 29(32.6%) | 53(34.4%) | |
| • Graduate | 10(17.5%) | 24(27%) | 31(20.1%) | |

| | | | | |
|---|---|---|---|---|
| **Income (Rs)** | | | | |
| •    <25000 | 23(40.4%) | 24(27%) | 42(27.3%) | $\chi^2$=18.172 |
| •   25000-50000 | 14(24.6%) | 26(29.2%) | 35(22.7%) | P=0.006** |
| •   50000-100000 | 7(12.3%) | 10(11.2%) | 45(29.2%) | |
| •   >100000 | 13(22.8%) | 29(32.6%) | 32(20.8%) | |
| **Smoking/Alcohol** | | | | |
| •   Alcoholic | 25(43.8%) | 31(34.8%) | 74(48.1%) | $\chi^2$=4.023 P=0.134 |
| •   Smoker | 29(50.8%) | 16(17.9%) | 29(18.8%) | $\chi^2$=26.038 P<0.001** |

## CONCLUSION

The study results suggest that male patients, patients with the age group 41-50, normal weight patients and patients with the positive family history were more exposed to risk factors when compared to other groups, more number of patients were highly adherent to their medications. This study concludes that certain educational programs are needed to educate the people to emphasize the importance of medication adherence and modification to their life style to reduce the complications associated with CKD.

## ACKNOWLEDGMENT

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