

# A Prospective Observational Study on Non - Communicable Disease Riskfactors in Family Members of Patients with Chronic Kidney Disease

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**Abstract:** Non communicable diseases [NCDs] morbidity and mortality pose large and inequitable health and economic burden on individuals, society and health system. According to the national health profile 2019, 6.51 crore patients were screened at NCD clinics as a part of national programme for prevention and control of cancer, diabetes, CVD and stroke [NPCDCS] from jan1 - dec31 2018. As the reports shows the burden of NCDs increase from 30 - 55%. Hence there is a need of screening and monitoring NCD risk factors to reduce the NCD burden on community. **Objectives:** To find baseline information on different NCD risk factors and their trends in CKD Patient's family members. **Methods and Material:** In this prospective observational study the CKD patient family members of all age groups above 18 were taken. STEP [1, 2, 3] are followed. **Results:** The prevalence of at least one NCD was 94.1%. Among the study subjects the prevalence of alcohol consumption, smoking and physical in activity was 24.3%, 28.5%, and 70.2% respectively. The prevalence of hypertension, diabetes and CKD was 88.2%, 20.16% and 24.3% respectively. Hypertriglyceridemia was observed in 38.6% of subjects. **Conclusions:** More attention is needed in the management of NCDs risk factors to reduce the prevalence and progression of NCDs. Screening and monitoring should be done in and outpatient department irrespective of their symptoms for early diagnosis. Health care providers should extend their services to the family members of NCD affected patients as prevalence was high in family members than the normal population.

**Keywords:** Non Communicable Disease; Risk Factors; Alcohol; Hypertension; Diabetes

## 1. Introduction

Non communicable diseases [NCDs], also known as chronic diseases, tend to be of long duration and are the result of a combination of genetic, physiological, environmental and behaviours factors. <sup>[1]</sup>Of 56.9 million global deaths in 2016, 40.5 million, or 71%, were due to non - communicable diseases [NCDs]. The leading causes of NCD deaths in 2016 were cardiovascular diseases [17.9 million deaths, or 44% of all NCD deaths], cancers [9.0 million, or 22% of all NCD deaths], and respiratory diseases, including asthma and chronic obstructive pulmonary disease [3.8 million of 9% of all NCD deaths]. Diabetes caused another 1.6 million deaths. <sup>[2]</sup>

According to WHO 2013 behavioural and biological risk factors like alcohol consumption, smoking, physical in activity, abnormal BMI, un healthy diet, raised blood

pressure, diabetes, elevated triglycerides predisposition to develop NCDs <sup>[3]</sup>

An integrated approach to risk factor surveillance is needed for NCD control. In this study prevalence of various risk factors is examined using WHO STEPS approach. Modification of these risk factors not only reduces the incidence of NCDs but also ensures a better outcome for those having NCDs. <sup>[4]</sup>

## 2. Aim & Objectives

### 2.1 Aim of the study

The aim of this study was to report the prevalence of NON - COMMUNICABLE DISEASE

**Risk factors in family members of patients with CKD**

## 2.2 Objectives of the study

- To collect patient family member's physical measures and biochemical measures like blood sugar, triglycerides, serum creatinine by using WHO STEPSs approach.
- To find baseline information on different NCD risk factors and their trends in CKD Patient's family members.
- To find out the prevalence of CKD in family members of CKD patient by estimated GFR value using National kidney foundation calculator.
- To provide patient counselling to subjects at risk and abolish the modifiable risk factors.
- To council the subjects who are less adhere to the treatment of risk factors.
- To council the patient family members about importance of frequent monitoring of Risk factors

## 2.3 Subjects and Methods

**Study are and setting:** this present study was undertaken in a tertiary care hospital in Guntur in dialysis and in patient department. Nearly 200 CKD patient family members were counselled regarding NCDs.

Of these 119 respondents were included in the study.

### Inclusion Criteria:

- Age [ $< 18$  years]
- Patients who are willing to participate

### Exclusion Criteria:

- Pregnant and lactating women
- Patients who are not responding and uncooperative are excluded.

**Study design:** the present study was a cross - sectional study

**Study population:** the respondents who participated in the study were  $>18$  years of age [CKD patient family members]

**Study duration:** the data was collected during the months of june2019 - november2019.

**Sample size:** The sample size of 119 was calculated using n - master formula by reviewing the previous articles, considering a 95% confidence level, 5 % margin of error.

**Data collection tool:** WHO 2005 STEPS questionnaire [STEP - 1, 2, 3] was used. STEP - 1 includes demographic information such as age, gender, demographic status, behavioural measures, dietary habits and physical habits.<sup>[5]</sup> STEP - 2 include anthropometry measurements. STEP - 3 includes bio - chemical measures.

**Data collection:** The investigator interviewed the selected respondent, where if required clarification's are given on the quires. After obtaining the informed consent, interviewer collected the information using pre - designed WHO STEPS questioner.

Primarily the respondents were asked about their demographic details. People above and below poverty line

are segregated based on their ration card. [white card - below poverty line, pink card/no card - above poverty line]. The educational status was classified as no formal education, primary school not completed, primary school completed, secondary school completed, high school completed, university or college, post - graduation, refused to say.

Information on diet physical activity, behavioural habits are obtained. Information of past NCD history was acquired.<sup>[5]</sup>

Data analysis: chi - square test was applied to get prevalence ratio and the level of significance was fixed as 5% with 95% confidence interval.

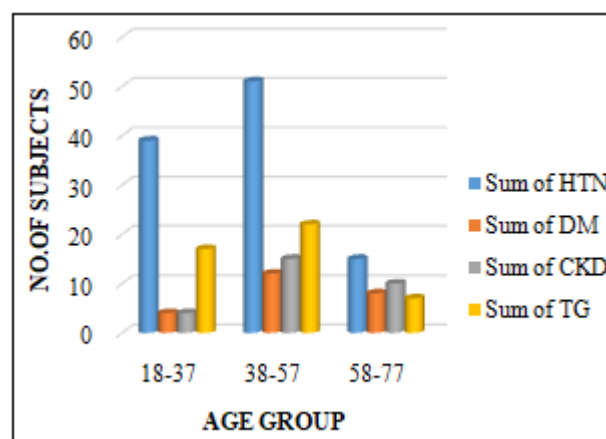
## 3. Results

The total no of respondents were 119 persons. Majority of subjects were females [59.6%], greater respondents were present in literates. About 66 [55.4%] respondents were above poverty line.

Of total CKD patient family members 45 (38 %) in group 1 in which 39 (86.8%) CKD patient family members were with hypertension, 4 (8.8%) CKD patient family members were with diabetes, 20 (n=44) CKD patient family members were with CKD, 17 (37.4%) CKD patient family members were with hypertriglyceridemia. in group 2 total CKD patient family members were 59 (49.5%) in which 51 (81.6%) CKD patient family members were with hypertension, 12 (19.2%) CKD patient family members were with diabetes, 45 (72%) CKD patient family members were with were with CKD, 22 (35.2%) CKD patient family members were with elevated triglycerides. in group 3 of 15 (12.6%) CKD patient family members 15 (100%) people were effected with hypertension, 8 (52.8%), 15 (100%), 7 (n=46.2) CKD patient family members were effected with diabetes, CKD, elevated triglycerides respectively.

**Table 1:** NCD's Distribution among Subjects based on Age

AGE	BP	PPBS	CKD	TG
18 - 37	39	4	4	17
38 - 57	51	12	15	22
58 - 77	15	8	10	7



**Figure 1:** NCD's Distribution among Subjects Based on Age

From the table it was found that high prevalence of hypertension was noted in no formal school group i.e. 100% (n=1) followed by high school completed group 92.3% (n=14), less than primary school 92.3% (n=24) and high prevalence of DM was noted in no formal school group 100% (n=1) followed by less than primary school 34.2% (n=9) were prevalence of hypertriglyceremia was noted in no

formal school 100% (n=1) followed by primary school completed 75.2% (n=16) and high prevalence of CKD was noted in less than primary school and followed by post-graduation group 41.3% (n=12) and primary school completed 20.6% (n=6).

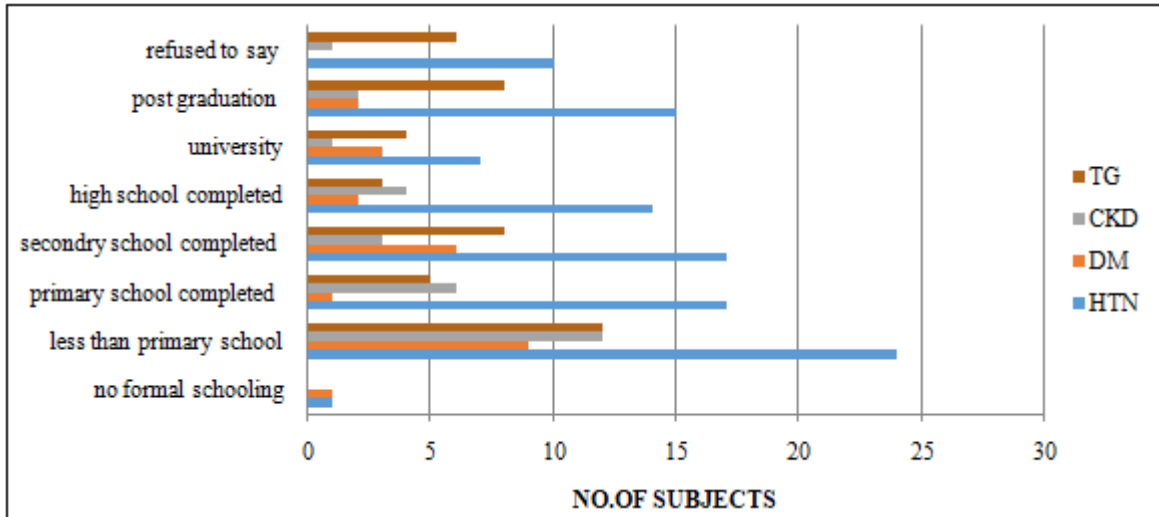


Figure 2: NCD's Distribution among Subjects based On Education

Based on monthly income of Subjects they are divided in to two groups group with above poverty line and people in below poverty line prevalence of hypertension was high in above poverty line group 90% (n=60). Where prevalence of diabetes was almost nearer i.e. 19.5% in above poverty line group and 19.8% in below poverty line group. Where prevalence of CKD 55.1% (n=16) in below poverty line group and hypertriglyceremia was noted in above poverty line group 39.3% (n=26).

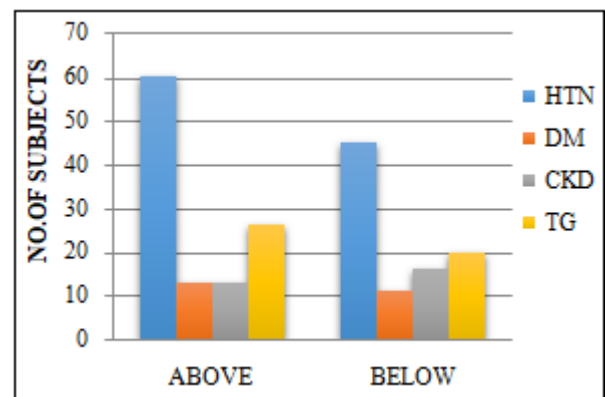


Figure 3: NCD's Distribution among Subjects based On Income

Table 2: NCD's Distribution among Subjects based on Education

Education Status	Hypertension	Diabetics	CKD	TG
No Formal Schooling	1	1	0	0
Less Than Primary School	24	9	12	12
Primary School Completed	17	1	6	5
Secondary School Completed	17	6	3	8
High School Completed	14	2	4	3
College Or University	7	3	1	4
Post - Graduation	15	2	2	8
Refused To Say	10	0	1	6

Table 3: NCD's Distribution among Subjects based on Income

Poverty Line	Hypertriglyceremia	CKD	Diabetes	Hypertension
Above poverty line	26	13	13	60
Below poverty line	20	16	11	45
Grand Total	46	29	24	105

Table: 4 depicts that the total prevalence of DM was [20.1%] female accounts for greater number [21.1%] were men parts less [18.7%]. The prevalence of hypertension was high with men [91.8%]. Out of 119 respondents 29 [24.3%] men respondents were high 28 [58.3%] and only 1 person in female remains alcoholic. For diet, 20 [16.8%] are on healthy diet [consume fruits and vegetables ≥3days a week] where 99 [83.1%] reported that they do not consume fruits and vegetables <3 times a week. Out of 119 respondents 84 [70.5%] were physically in active and 35 [29.4%] were physically active. Prevalence of abnormal BMI [over weight/obesity] was 66.1% in female and 60.4% in men.

**Table 4:** Prevalence of various risk factors for non - communicable diseases in the study population by gender (n=119)

Variables	Male (n=48)		Female (n=71)		Total (n=119)	
	n	%	N	%	N	%
Smoking						
Smoker	30	62.5	4	5.6	34	28.5
Non - smoker	18	37	67	94.3	85	71.4
Alcohol consumption						
Yes	28	58.3	1	1.4	29	24.3
No	20	41.6	70	98.5	90	75.6
Physical activity						
Active	15	31.2	20	28.1	35	29.4
In active	33	68.7	51	71.8	84	70.5
Dietary habit						
Healthy diet	7	14.5	13	18.3	20	16.8
Un healthy diet	41	85.4	58	81.6	99	83.1
Nutritional status						
Over weight/obese	29	60.4	47	66.1	71	59.6
Others	19	39.5	29	40.8	48	40.3
Hypertension						
Hypertensive	46	95.8	59	83	105	88.2
Non - hypertensive	2	4.1	12	16.9	14	11.7
Diabetes						
Diabetics	9	18.7	15	21.1	24	20.1
Non - diabetics	39	81.2	56	78.8	95	79.8

Through bivalent analysis, subjects with diabetes had 1.26 times higher prevalence than non - diabetics, where hypertensive are 1.14 times higher prevalence than non - hypertensive to CKD. Aged people are 4.1 times more prevalent to CKD than young population in this study. Female subjects, alcoholics and people under below poverty line are 1.5 times higher prevalence to develop CKD.

**Table 5:** Bi - variant analysis for chronic kidney disease

Characteristics	Number (n=119)	N	(%) with CKD	PR	P value	a P value
Age						
18 - 37	45	4	8.88	1		
>38	74	25	33.7	4.1	0.066	0.00018
Gender						
Female	71	20	28.1	1.5	0.005	0.0004
Male	48	9	18.7	1		
Economics						
Above	66	13	19.6	1		
Below	53	16	30.1	1.5	0.09	0.0085
Alcohol						
Yes	29	6	20.6	1.5	0.021	0.0019
No	90	3	25.5	1		
Physical activity						
Active	35	10	28.5	1.27	0.14	0.0136
In active	84	19	22.6	1		
BMI						
Normal	48	22	45.8	1		
Abnormal	71	7	9.85	0.2	0.227	0.023
Diet						
Healthy	20	7	35	1.59	0.215	0.217
Un healthy	99	22	22.2	1		
Triglycerides						
High	46	11	23.9	1		
Normal	73	18	24.6	1.04	0.066	0.006
Smoking						
Smoker	34	5	14.7	0.5	0.13	0.0125
Non - smoker	85	24	28.2	1		

Hypertension						
Hypertensive	105	26	24.7	1.14	0.20	0.02
Non - hypertensive	14	3	21.4	1		
Diabetes						
Diabetic	24	8	33.3	1.26	0.25	0.025
Non - diabetic	95	21	22.1	1		

#### 4. Discussion

The most prevalent NCDs risk factors were HTN, physical inactivity, unhealthy diet and abnormal BMI. Nearly 88.2 % of the participants were HTN, 23.36 % were in CKD at stage 3, 38.6 % and 20.16% of hypertriglyceremia and DM respectively.

The socio demographic characters like age and income, impacts on the prevalence of the common NCDS and their risk factors

According to the reports of National Institute of Nutrition Telugu states have the second highest rate of prevalence of hypertension. Hypertension ranks the highest prevalence in this study 88.2%. Hypertension prevalence was high in the age group below 38 - 57 years and then increases in women, due to post - menopausal condition. This report was as resemblance with previous studies. [6]

India is deemed as the world's capital of DM [7]. Which may be due to growing unhealthy food habits and sedentary lifestyle along with the influence of genetic and environment factors. In this study prevalence of diabetes was 20.16% and it was found to be 18.75% in male and 21.12% in female. Our reports are in corresponding with other studies done in neighbouring city Vijayawada [8], [9].

Hyper triglyceremia is one of the major risk associated with cardiovascular mortality [10]. Prevalence in our study was 38.64% which was lower than findings of previous study. In this study elevated triglycerides was high in female which was similar with other studies [11]. Reason for elevation may be due to high carbohydrates intake, inadequate consumption of fruits and vegetables.

The prevalence of diet habits was observed UN healthy in 83.1% of subjects which was similar or in accordance with findings of other studies done in Tamil Nadu [12], and higher than the findings of other studies [13]. This was attributed due to low economic status and lack of awareness regarding the benefits in consumption.

Physical inactivity has been found to be a significant risk factor for NCD related mortality. It increase the risk of heart disease, stroke, DM. In this study physical inactivity was observed in 70.2% of subjects which was higher than the findings of other studies done in Andhra Pradesh and Bangladesh [14, 15]. Physical inactivity or sedentary life style is increasing day by day was due to busy life style and lack of proper awareness. Hence promotion of community education is needed.

Smoking is the leading cause of preventable mortality [16]. There is a huge economic burden on health system and the family members of smokers. [17] The prevalence of smoking

was found to be 25.2% among male and 3.36% in female. Our study was as closer to the study done by other studies [18], But prevalence was less in this study as compared to the study done previously [18]. Rising prevalence of smoking was due to in electable marketing strategies and dependency. This might require campaigning and awareness programs.

The present study alcohol prevalence was found to be 24.36% which was due to stress full life style, drinking habitat early age, dependency, depression and family history [19]. however it was less when compared with other studies. Increasing government taxation on liquor may help to reduce the prevalence.

Obesity & overweight was found to be 41.16% in this study which was due to unhealthy diet, age, genetic and environmental factors. However it was nearer to the previous study [20].

CKD has been a global public health problem with increasing incidence and prevalence. It accounts for high morbidity and mortality. The main reported causes include old age, family history of CKD, hypertension, DM, cardiovascular diseases [21]. In our study prevalence of CKD stage –II was 42.84% and stage - III accounts for 24.36% this study was higher than other studies [22] because of genetic factor and high prevalence of other renal risk factors.

## 5. Conclusion

Hence more attention is needed in the management of NCDs risk factors to reduce the prevalence and progression of NCDs. This study reveals that diabetes, hypertension, age, alcohol consumption are major risk factors for developing NCDs. Awareness regarding negative effects of limit less alcohol consumption can be given to the community. Screening and monitoring should be done in and outpatient department irrespective of their symptoms for early diagnosis. Health care providers should extend their services to the family members of NCD affected patients as prevalence was high in family members than the normal population.

## 6. Acknowledgement

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