|| ISSN(online): 2589-8698 || ISSN(print): 2589-868X ||

Available online on http://www.ijmbs.info

International Journal of Medical and Biomedical Studies; 2026; 10(1); 95-103

Original Research

Study of demographic profile and risk factors of Non-communicable diseases in Kalaburagi district, Karnataka, India

Chandrakala[1], Pramod[2], Vijay Kumar[3], Danesh Pattanshetty[4], Karthik M Pasodi[5]

[1]Professor, Department of General Medicine, FOMS-KBNU, India
[2]Junior Resident, Department of General Medicine, FOMS-KBNU, India
[3]Junior resident, Department of General Medicine, FOMS-KBNU, India
[4]Junior resident, Department of General Medicine, KBNU-FOMS, India
[5]Junior resident, Department of General Medicine, FOMS-KBNU, India

Received: 22-11-2025 / Revised: 24-12-2025 / Accepted: 19-01-2026
DOI: https://doi.org/10.32553/ijmbs.v10i1.3211
Corresponding author: Pramod
Conflict of interest: No conflict of interest

Abstract:

Background: The burden of non-communicable disease (NCDs) has changed over the decades, with increasing prevalence globally. The most common NCDs are obesity, hypertension and diabetes. The increased incidence of these disease highlights the need for epidemiological research at various level to calculate and estimate the burden and implement preventive measures for its control.

Material and methods: A cross-sectional observational study was done on 500 patients visiting the General Medicine OPD of a tertiary care hospital, Kalaburagi district, Karnataka, for a period of six months from December 2024 to May 2025. Patients aged more than 18 years and having at least one NCD were included in the study. Semi-structured questionnaire was used for data collection.

Results: Around 500 patients with any one NCD visiting General Medicine OPD from December 2024 to May 2025 were screened. The mean age of 500 patients was 54.3 ± 6.7 years. Around 65% were male and 35% were female. The mean age of male and female was 54.1 yrs and 53.2 yrs respectively. The majority of patients were between the age group 45-65yrs of age both in males and females (276 patients, 55.2%). The most common NCD reported among our patients was obesity (56.6%) followed by diabetes (47%) and hypertension (46%), NAFLD (25%), cardiovascular diseases (10.4%), COPD (9.1) and stroke (6%) Among 500 patients, most of them belonged to Hindu religion (61.8%) followed by Christian (26.8%) and Muslim (11.4%). In the present study 86.4% were from urban area and 12.6% were from rural area belonging to socioeconomic class III (26.8%) and IV (21.4%). Obesity and hypertension were the most common NCDs in both urban and rural populations respectively. Majority had their schooling up to secondary and middle school. More than 50% i.e., 336 patients were aware about the nature, risk factors, and long-term complications of NCDs. Among the modifiable risk factor sedentary life style was seen in 35.2%, excess calorie intake than the recommended quantity was consumed by 44.2%, smoking and alcohol intake was seen among 37.2% and 40.6% of patients with NCD respectively. Over 50% of patients reported a positive family history of non-communicable diseases, indicating a significant familial risk burden. Based on Body Mass Index (BMI), 19.2% were overweight and 56.6% obese. Elevated Waist: Hip Ratio (WHR) was seen among 66.6% of patients.

Conclusion: The sociodemographic profile and the risk factors contribute to most of the Non communicable diseases. Hence there is a need for educational intervention along with

behavioural changes to delay the occurrence of various Non communicable diseases which can decrease the burden of these diseases in our country.

Keywords: Non-communicable disease, Hypertension, Diabetes, Risk factors

Introduction

Non-communicable diseases (NCDs) are illnesses that are not transmitted from individual to individual and generally have a long duration with gradual progression. It comprises a variety of conditions, but commonly seen are cardiovascular diseases, COPD, diabetes and cancers. The burden of NCDs has changed over the decades, with increasing prevalence globally. This has been mainly attributed to demographic aging, changes in diet and physical activity, urbanization, and other genetic factors. During 2020, about 41 million people died from NCD worldwide. More than 78% of this death occurred among the low- and middle-income countries.[1] About 5.8 million deaths due to NCDs have been reported in India i.e about 1/4th of Indian is at a risk of dying due to NCD. [2]

Individuals with NCDs are also at a greater risk of high health care cost, which can lead to poverty due to out-of-pocket expenditure. [6] Recent evidence suggests the rise of disease equally among the urban and rural population. [7] The increased incidence of these disease highlights the need for epidemiological research at various level to calculate and estimate the burden and implement preventive measures for its control. Additionally, a wide variation of inter-state occurrence of NCD has be documented by an ICMR study [8] and hence the necessity to study disease burden in our setting.

Aim of the study

1. To assess the demographic profile of non-communicable disease among patients presenting the general medicine OPD of a tertiary care hospital.
2. To assess the risk factor associated with the non-communicable disease among those patients,

Material and methods

A cross-sectional observational study had been done on 500 patients above the age of 18yrs having at least one NCD who visited the General Medicine OPD of a tertiary care hospital, Kalaburagi district, Karnataka, for a period of six months from December 2024 to May 2025. Those presenting with only communicable disease, inconclusive diagnosis and not willing to give consent were excluded.

Data collection was done using a semi-structured questionnaire comprising of three sections. The first section comprised details of NCD and sociodemographic details of the patients such as age, sex, religion, residence, socioeconomic status (Modified BG Prasad scale) and education. The second section comprised of the various risk factors of NCD such as physical activity, calorie intake (based on 24-hour recall method) Body Mass Index (BMI), waist hip ratio, alcohol and smoking.

Statistical analysis: Data analysis and data entry was done using Microsoft excel. Quantitative data was expressed in mean and standard deviation while qualitative data in frequency and percentage.

Results

The mean age of 500 patients with any NCD was 54.3 ± 6.7 years. Around 65% were male and 35% were female. (Table 1) The most common NCD reported among our patients was obesity (56.6%) followed by diabetes (47%) and hypertension (46%), NAFLD (25%), cardiovascular diseases

(10.4%), COPD (9.1) and stroke (6%) (Table 2)

Based on the demographic factors, the most commonly involved age group both in males and females was between 45 to 65 years (55.2%). Among the social factors, most belonged to Hindu religion (61.8%) followed by Christian (26.8%) and Muslim (11.4%). In the present study 86.4% were from urban area belonging socioeconomic class III (26.8%) and IV (21.4%). Obesity and hypertension were the most common NCDs in both urban and rural populations respectively. Majority had their schooling up to secondary and middle school. More than 50% i.e., 336 patients were aware about the nature, risk factors, and long-term complications of NCDs. (Table 3)

Among the modifiable risk factor sedentary life style was seen among 35.2%, excess calorie intake than the recommended quantity was consumed by 44.2%. Smoking and alcohol intake was seen among 37.2% and 40.6% of patients with NCD. Over 50% of patients reported a positive family history of non-communicable diseases, indicating a significant familial risk burden. (Table 4)

BMI cut-off of overweight was taken as more than 23-24.9 kg/m2 while that of obese more than 25 kg/m2 according to ICMR/WHO Asia-Pacific criteria. Using this cut-off, 19.2% were overweight and 56.6% were obese. Waist-hip ratio (WHR) was calculated for all patient with a cut-off more than or equal to 0.9 for male and 0.85 for female according to ICMR/WHO Asia-Pacific criteria. Elevated WHR was seen among 66.6% of patients. (Table 5)

Discussion

Non-communicable disease (NCD) is a leading cause of public health concern and contribute to 70% of global mortality.[9] Overall, in the world, NCDs are the prime determinant of disability and mortality. NCDs contribute to around 38 million (68%) of all the deaths globally and to about 5.87 million (60%) of all deaths in India.

Understanding the burden of risk factors is considered essential to identify high-risk individuals by the various screening test. They are classified as modifiable and non-modifiable risk factors. The modifiable risk factors include diabetes mellitus, high blood pressure, smoking, alcohol, physical inactivity, high blood cholesterol and obesity, while the non-modifiable risk factors are age, gender, race, ethnicity and genetic factors. [3,4] Although age and gender are non-modifiable factors, most of their associated factors are modifiable. The non-modifiable factors can also be classified into three causes. These are biological factors (such as hyper-insulinaemia, hypertension, overweight and dyslipidaemia), behavioural factors (such as diet, decreased physical activity, smoking, and alcohol intake) and lastly societal factors (such as socioeconomic, environmental and cultural parameters.[5]

Evaluating the demographic variables patients with NCD and identifying the risk factors are important to develop targeted public health strategies and plan appropriate intervention. The present aimed to study the sociodemographic and clinical risk factors of patients with common NCDs.

In the present study out of 500 participants with non-communicable diseases (NCDs), males constituted the majority with 326 participants (65.2%), while females accounted for 174 participants (34.8%), indicating a clear male predominance in the study population.

Among the sociodemographic variables age has a substantial role in predicting NCD vulnerability. Advancing age is a significant risk factor for developing NCD mainly due to oxidative stress, chronic inflammation and physiological wear and tear. Most of the NCD become apparent in the middle age after 45 years.[12] The burden of NCDs was highest in the 45–65-year age group for both sexes. Among 500 participants, 401 are aged above 45years. Among males, 181 participants (55%) belonged to this age group, while among

females, 95 participants (54%) were in the same category, reflecting that middle-aged and early elderly individuals form the largest affected group.

In our study also more than 55.2% belonged to the age group between 45-65years. Participants aged more than 65 years constituted the second largest group, with 83 males (25%) and 42 females (24%), suggesting a substantial proportion of elderly individuals with NCDs. Hence, screening for NCD can be initiated at this age in resource limited setting. Additionally, it has been documented that among the lower income countries, 80% of the death due to NCD occurs among those ages lesser than 60 years, which affects the country's economy by reducing the working population and increases the health expenditure on long term. [13]

Younger age groups contributed relatively fewer cases. In the 25–44-year age group, 42 males (12%) and 23 females (13%) were affected, whereas the 18–24-year group had the lowest representation, with only 20 males (6%) and 14 females (8%), indicating that NCD prevalence increases markedly with advancing age. (Table 1). Overall, the age-sex distribution demonstrates that NCDs predominantly affect middle-aged and elderly populations, with a higher prevalence among males, which may be attributed to greater exposure to behavioural risk factors such as smoking, alcohol consumption, occupational stress, and sedentary lifestyle, as well as differences in healthcare-seeking behaviour.

A study by Nath et.al. in Assam had reported obesity, hypertension and diabetes to be the commonest NCD. [10] In the present study, multiple combinations of non-communicable diseases (NCDs) were observed among the participants, with obesity frequently co-existing with other metabolic and cardiovascular conditions. The most common NCD combination was obesity with hypertension, seen in 95 participants (19%), followed closely by obesity with diabetes mellitus in 91 participants (18%). Obesity with non-alcoholic fatty liver disease (NAFLD) was also highly prevalent, affecting 75 participants (15%), highlighting the strong association between adiposity and metabolic liver disease. Comorbid hypertension and diabetes mellitus was present in 62 participants (12%), reflecting a substantial burden of cardiometabolic risk clustering. Diabetes mellitus with NAFLD was observed in 50 participants (10%), further emphasizing the metabolic continuum between glycaemic dysregulation and hepatic steatosis.

Cardiovascular disease was commonly associated with other NCDs, though with relatively lower frequencies. Obesity with cardiovascular disease was noted in 22 participants (4%), while hypertension with cardiovascular disease was present in 18 participants (3%), and diabetes mellitus with cardiovascular disease in 12 participants (2%). Additionally, hypertension with stroke was documented in 30 participants (6%), indicating a significant proportion with established macrovascular complications. Respiratory comorbidities were also observed, with COPD co-existing with hypertension in 25 participants (5%), and COPD with diabetes mellitus in 20 participants (4%), suggesting overlapping risk factors such as smoking, systemic inflammation, and metabolic dysfunction. (Table 2)

Overall, the distribution demonstrates a high prevalence of multimorbidity involving obesity, hypertension, diabetes, and NAFLD, underscoring the interrelated pathophysiology of metabolic and cardiovascular disorders in the study population and reinforcing the need for integrated screening and management strategies.

Common risk factors include unhealthy diets that are high in sugar, salt, and fat. Lack of physical activity can also lead to obesity and other health problems. Tobacco use and excessive alcohol consumption are

major contributors to many NCDs. High blood pressure, high blood sugar and high cholesterol also increase the risk.

Historically men are known to have greater risk of cardiovascular disease and tobacco related illness due to more exposure to alcohol, smoking, and hazards at work. Other studies have also reported NCD risk to be more among male. [14,15] The proportion of male (65.2%) in our study was almost double that of females (34.8%). While a study by Fottrell et.al. [16] found women to have high risk of obesity. Hormonal and behavioural factors are mainly more likely to contribute to it. A study by Sandhu et. al. [17] found Muslims to have a greater risk of abdominal adiposity than Hindus and Christian. In our study, most of the patients were Hindu, which is due to the fact that majority residing around our hospital belong to that religion.

Residence and socioeconomic status can significantly influence the occurrence of NCD. Historically urban residence was considered to be at greater risk of NCD due to decreased physical activity, consumption of junk food, increased stress and air pollution. But in recent times, rural areas also have increased occurrence of NCD due to change in life-style practise. [18] In our study most of the patients were from urban and belonged to middle socioeconomic class. Educational status can predict the awareness of health practise, early screening, treatment adherence, which is generally more among the educated individual. A study done in Assam had more patients who were either illiterate or completed only primary schooling.[10]

A clear gradient was observed between educational status and awareness of non-communicable diseases. All illiterate participants were found to have poor awareness regarding NCDs, and a substantial proportion of participants with primary (67) and middle school education (65) also demonstrated inadequate awareness about the nature, risk factors, and long-term complications of NCDs. In contrast, only a small fraction of participants with secondary school education (32) lacked adequate awareness, while the majority of participants with diploma and graduate-level education were well aware of NCDs and their preventive measures. (Table 3)

These finding highlights that lower educational attainment is strongly associated with poor awareness and understanding of NCDs, which may contribute to delayed diagnosis, poor treatment adherence, and inadequate lifestyle modification. Conversely, higher educational levels appear to facilitate better health literacy, early health-seeking behaviour, and improved disease management. These observations emphasize the need for targeted health education and community-based awareness programs, particularly focusing on populations with low educational status, to improve early detection and prevention of NCDs

Sedentary lifestyle is considered an important determinant in causing rise in NCDs. Increased usage of technology, mode of transportation and limited space and time for recreational activities as resulted in decreased physical activity globally. In our study 35.2% were sedentary workers, while Nath et. al. [10] in their study found only 21.9% to have a sedentary lifestyle.

A meta-analysis study done in India found the average calorie intake increased during the period of 1990s and 2010s, but this did not show any consistent increase in the prevalence of NCDs in that area. They concluded that the quality of food intake is more essential than quantity. [19] Traditional high fibre, whole grains and vegetable is gradually getting replaced by processed food, sugary beverages, and high trans-fat content. Patients' awareness of the type of food consumed and its impact of health should be created. Proportion of patients with NCD with an excess intake of

calorie in our study was very high i.e. 44.2%. (Table 4)

A study in Assam found 52.8% to be overweight and above, while 18.6% had abnormal waist: hip ratio. Presence of excess fat in the body cause metabolic imbalances, dyslipidaemia, fatty liver, increases insulin resistance, and chronic inflammation. Obesity present in early age leads to greater risk of diabetes and cardiovascular disease. Integrated approach involving health education in childhood at school, family -cantered strategies and policy reform can help address this issue. [20,21] Based on anthropometric measurement (BMI) more than 50% were obese or overweight, while elevated waist: hip ratio was seen among 66.6%. (Table 5)

Table 1: Distribution of study participants based on the age and sex.

Age	Male	Percentage (%)	Female	Percentage (%)
18-24	20	6	14	8
25-44	42	12	23	13
45-65	181	55	95	54
>65	83	25	42	24
Total	326	65.2	174	34.8

Table 2: Distribution of non-communicable diseases

Non-communicable disease	Frequency	Percentage
Obesity + Hypertension	95	19
Obesity + Diabetes mellitus	91	18
Obesity + cardiovascular diseases	22	4
Obesity + NAFLD	75	15
Hypertension + Diabetes mellitus	62	12
Hypertension+ cardiovascular diseases	18	3
Hypertension + Stroke	30	6
Diabetes mellitus + cardiovascular diseases	12	2
Diabetes mellitus+ NAFLD	50	10
COPD+ Hypertension	25	5
COPD+ Diabetes mellitus	20	4

Table 3: Distribution of sociodemographic profile

Sociodemographic variable		Frequency	Percentage
Age	>45	401	80.2
	<45	99	19.8
Sex	Males	326	65
	Females	174	35
Religion	Hindu	309	61.8
	Chistian	134	26.8
	Muslim	57	11.4
Residence	Urban	432	86.4
	Rural	68	13.6
Socioeconomic status	Class I	78	15.6
	Class II	94	18.8
	Class III	134	26.8
	Class IV	107	21.4
	Class V	87	17.4

Education	Illiterate	45	0.8
	Primary school	87	17.4
	Middle school	103	20.6
	Secondary school	172	34.4
	Diploma degree/Graduate	93	18.6

Table 4: Distribution of modifiable life-style risk factors

Life-style risk factor		Frequency	Percentage
Physical activity	Sedentary	176	35.2
	Moderate	213	42.6
	Heavy	111	22.2
Calorie intake	Decreased	65	13.0
	Normal	214	42.8
	Excess	221	44.2
Smoking		186	37.2
Alcohol intake		203	40.6

Table 5: Distribution of anthropometric risk factors

Anthropometric risk factor		Frequency	Percentage
BMI	Underweight	32	6.4
	Normal	89	17.8
	Overweight	96	19.2
	Obese	283	56.6
Waist-hip ratio	Normal	167	33.4
	Elevated	333	66.6

Conclusion

The most common NCD encountered was obesity followed by hypertension and diabetes. As NCDs affect individuals during the mid-life which is the most productive years of life, they pose a major strain on the available health care resources. There is a need for educational intervention, awareness programs along with lifestyle modification to delay the occurrence of various modifiable risk factors to decrease the burden of these diseases in our nation.

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