



## ANALYSIS OF CARDIOVASCULAR DISEASE RISK PROFILES AMONG ADULTS PRESENTING FOR ROUTINE HEALTH EVALUATION AT A TERTIARY CARE HOSPITAL

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### ABSTRACT

**Background:** Cardiovascular diseases (CVDs) are one of the leading causes of morbidity and mortality worldwide and represent a major public health challenge in India. Increasing prevalence of obesity, dyslipidemia, smoking, sedentary lifestyle, and other behavioural risk factors contribute significantly to the growing burden of CVDs.

**Methodology:** A hospital-based cross-sectional study was conducted in the Department of General Medicine at Sree Mookambika Institute of Medical Sciences from May 2025 to March 2026 among individuals attending routine medical check-ups. Demographic details, anthropometric measurements, blood pressure, lipid profile, smoking status, physical activity, and socioeconomic status were assessed using a structured proforma. Cardiovascular risk was evaluated using the Joint British Societies for the Prevention of Cardiovascular Disease (JBS3) risk assessment tool.

**Results:** The study demonstrated a high prevalence of overweight and obesity, particularly among females. Hypertriglyceridemia and low HDL were more common in females, whereas elevated LDL and hypercholesterolemia were predominantly observed in males. Physical inactivity and smoking were highly prevalent among participants. Most individuals belonged to lower socioeconomic classes.

**Conclusion:** The findings indicate a high burden of modifiable cardiovascular risk factors among apparently healthy individuals, emphasizing the importance of early screening, lifestyle modification, and preventive interventions.

**Keywords:** Cardiovascular Diseases, Obesity, Dyslipidemia, Smoking, Physical Inactivity, BMI, Lipid Profile, Risk Factors.

### INTRODUCTION

Cardiovascular diseases (CVDs) are among the leading causes of mortality and morbidity worldwide and have emerged as a major public health challenge in both developed and developing countries. Rapid urbanization, sedentary lifestyle, unhealthy dietary habits, tobacco consumption, alcohol use, and increasing prevalence of obesity and diabetes have significantly contributed to the growing burden of CVDs globally.

According to the World Health Organization (WHO) Global Status Report on Non-Communicable Diseases (2014), non-communicable diseases (NCDs) account for nearly 70% of all global deaths, of which cardiovascular diseases contribute approximately 44.25%.<sup>1</sup> Early identification and modification of cardiovascular risk factors are therefore essential for reducing disease burden and improving overall health outcomes.

India is currently experiencing an epidemiological transition characterized by a rising prevalence of non-communicable diseases, particularly cardiovascular disorders. The Global Burden of Disease Study (2010) reported that nearly one-fourth (24.8%) of all deaths in India were attributable to cardiovascular diseases.<sup>2</sup> The increasing burden of CVDs in India is attributed to demographic changes, increased life expectancy, urban migration, and adoption of unhealthy lifestyles. In recent decades, cardiovascular diseases have affected not only the elderly population but also younger adults, leading



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to significant socioeconomic consequences and healthcare expenditure.

Several modifiable and non-modifiable risk factors have been identified in the development of cardiovascular diseases. Modifiable risk factors include hypertension, diabetes mellitus, dyslipidemia, obesity, smoking, alcohol consumption, physical inactivity, unhealthy diet, and psychological stress, whereas age, gender, and family history are considered non-modifiable factors.<sup>3</sup> Among these, behavioural and metabolic risk factors play a crucial role in the progression of atherosclerosis and other cardiovascular complications. Physical inactivity and obesity have become increasingly common due to modernization and sedentary occupations, particularly in urban populations. Dyslipidemia, characterized by elevated low-density lipoprotein cholesterol and triglycerides along with reduced high-density lipoprotein cholesterol, further increases cardiovascular risk.

Socioeconomic status also influences cardiovascular health. Individuals belonging to lower socioeconomic groups often have limited access to healthcare facilities, preventive screening, and health education, thereby increasing susceptibility to cardiovascular diseases.<sup>4</sup> Regional variations in the prevalence of cardiovascular risk factors have also been observed across India. Studies indicate that obesity and overweight are more prevalent in southern and northern regions of India, whereas comparatively lower prevalence has been reported in central India.<sup>5</sup> Such variations may be related to differences in dietary practices, lifestyle patterns, cultural habits, and urbanization levels.

Routine medical check-ups in tertiary care hospitals provide an excellent opportunity for early detection of cardiovascular risk factors among apparently healthy individuals. Identification of these risk factors at an early stage can help initiate preventive strategies and lifestyle modifications, thereby reducing morbidity and mortality associated with cardiovascular diseases. Hence, the present study aims to assess the risk factors for cardiovascular diseases among individuals visiting a tertiary care hospital for routine medical examination.

### **Aim**

To assess the risk factors associated with cardiovascular diseases among individuals visiting a tertiary care hospital for routine medical check-up.

### **Objectives**

1. To identify the prevalence of major cardiovascular risk factors such as hypertension, diabetes mellitus, obesity, dyslipidemia, smoking, alcohol consumption,

and physical inactivity among the study participants.

2. To evaluate the association between demographic variables such as age, gender, and socioeconomic status with cardiovascular disease risk factors.

### **METHODOLOGY**

This hospital-based cross-sectional study was conducted in the Department of General Medicine at Sree Mookambika Institute of Medical Sciences. The study was carried out over a period of eleven months from May 2025 to March 2026 among individuals attending the tertiary care hospital for routine medical check-up. After obtaining informed consent, participants were evaluated using a structured proforma which included demographic details, lifestyle characteristics, socioeconomic status, smoking habits, and physical activity patterns. Objective anthropometric measurements such as height, weight, Body Mass Index (BMI), and blood pressure were recorded using standard procedures. Biochemical investigations including lipid profile parameters such as total cholesterol, triglycerides (TG), high-density lipoprotein (HDL), and low-density lipoprotein (LDL) were also assessed.

Cardiovascular disease risk was evaluated using the Joint British Societies for the Prevention of Cardiovascular Disease (JBS3) risk assessment tool, which is considered suitable for the Indian population. Body Mass Index was classified according to World Health Organization (WHO) guidelines. Lipid abnormalities were categorized based on the National Cholesterol Education Program Adult Treatment Panel III (NCEP-ATP III) guidelines. Socioeconomic status was assessed using the modified Kuppuswamy scale, which considers the education, occupation, and monthly income of the head of the family to derive a composite score ranging from 3 to 29.

The collected data were entered into Microsoft Excel and analyzed using Statistical Package for Social Sciences (SPSS) software version 25.0. Descriptive statistics such as mean, standard deviation, frequency, and percentage were used to summarize the variables. Association between categorical variables was analyzed using the Chi-square test, while continuous variables were compared using Student's t-test. A p-value of less than 0.05 was considered statistically significant.

### **RESULT**

The study population comprised of 92 subjects and included 44 males and 48 females. According to WHO classification of BMI, nearly 62% of our study subjects would fit in overweight/obese class and 17.39% of subjects had normal BMI of 18.5-22.9.

Based on gender, 70.83% of females and 52.27% of males were pre-obese/obese. The prevalence of hypertriglyceridemia and low HDL were significantly more in females but hypercholesterolemia and high LDL were higher in males (83% vs. 79%, 95% vs. 81%, 31% vs. 27%, 42.6% vs. 86%) respectively (Figure 1 and 2). Self-reported physical activity of the participants showed

that out of 92 study subjects, only 34 were being physically active [36.95%]. Based on the socioeconomic status approximately 91.3% of study subjects be-longed to upper lower and lower class (Kuppuswamy scale). In the study, out of 44 males, 32 reported to be smokers, 46.87% were in age group of 50-69 followed by 37.5% in 30-49 and remaining in 70-89 years of age.

Table 1: This Table Demonstrate The Dyslipidemia As Per Age And Gender.

	MALE (n=44)			FEMALE (n=48)			
HDL (n=92)	3	4	1	0	2	0	NR (n=10)
	18	13	5	17	29	0	AB_NR (n=82)
LDL (n=92)	4	2	0	3	7	0	NR (n=16)
	17	15	6	14	24	0	AB_NR (n=76)
TC (n=92)	13	12	5	10	25	0	NR (n=65)
	8	5	1	7	6	0	AB_NR (n=27)
TG (n=92)	6	3	0	4	4	0	NR (n=17)
	15	14	6	13	27	0	AB_NR (n=75)
30-49 (n=21)	50-69(n=17)	70-89 (n= 6)	30-49 (n= 17)	50-69 (n= 31)	70-89 (n= 0)		
NR=Normal, AB_NR=Abnormal							

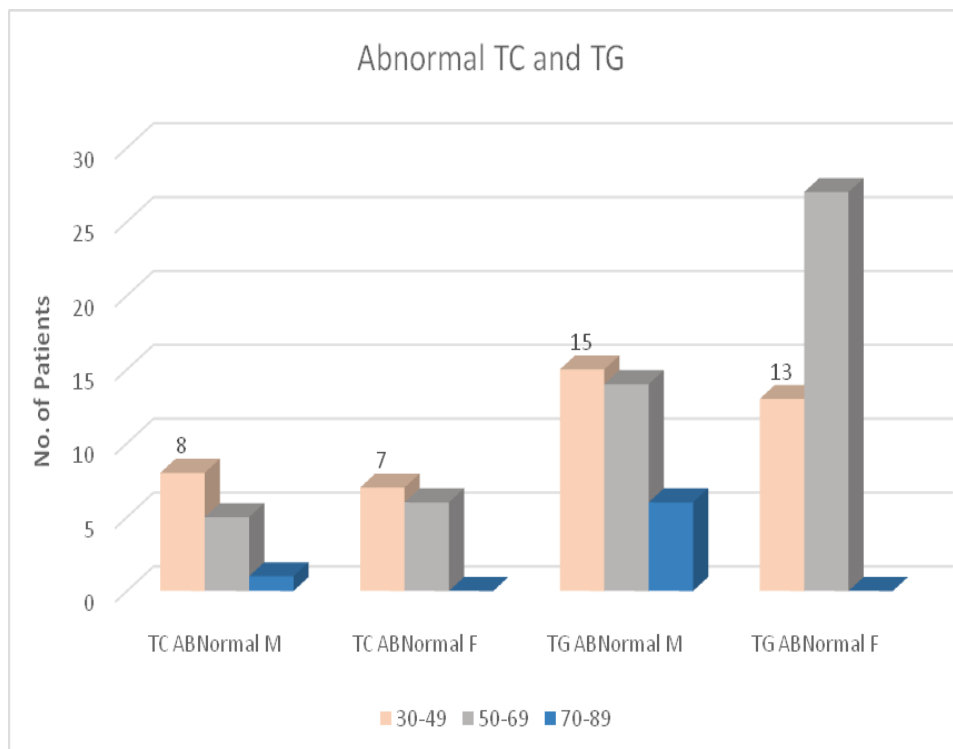


Figure 1: This Figure showed the abnormal Total cholesterol and Triglyceride level in male and female study subjects. TC ABNormal M= Total cholesterol abnormal in males, TC ABNormal F= Total cholesterol abnormal in females, TG ABNormal M= Triglyceride abnormal in males, TG ABNormal F= Triglyceride abnormal in females

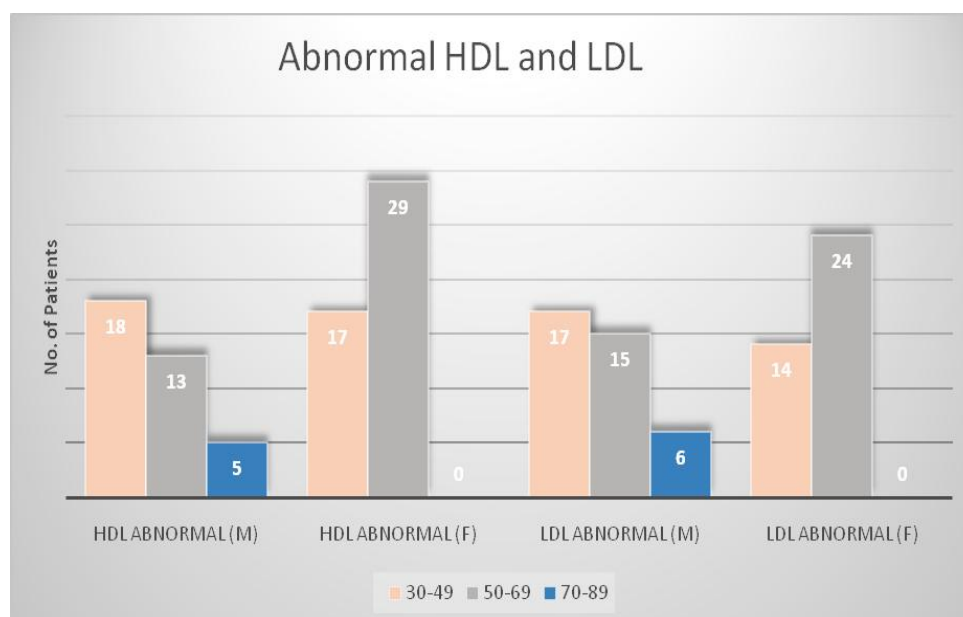


Figure 2: This Figure Indicated the Abnormal HDL and LDL in Male and Female Participant

## DISCUSSION

The present study highlights the significant burden of cardiovascular disease (CVD) risk factors among individuals attending routine medical check-ups at a tertiary care hospital. A considerable proportion of the study population belonged to the overweight and obese category, indicating the growing prevalence of adiposity-related health problems in the community. Obesity is a well-established modifiable risk factor for cardiovascular diseases and contributes to hypertension, insulin resistance, dyslipidemia, and metabolic syndrome.<sup>6</sup> In the present study, females showed a higher prevalence of overweight and obesity compared to males. Similar findings were reported in previous Indian studies, where sedentary lifestyle, hormonal factors, dietary habits, and reduced physical activity among women contributed to increased obesity prevalence.<sup>7</sup>

The study also demonstrated a high prevalence of dyslipidemia among participants. Hypertriglyceridemia and low high-density lipoprotein (HDL) levels were more common among females, whereas hypercholesterolemia and elevated low-density lipoprotein (LDL) levels were more frequently observed in males. Dyslipidemia plays a major role in the pathogenesis of atherosclerosis and significantly increases cardiovascular morbidity and mortality.<sup>8</sup> Low HDL cholesterol is considered an independent risk factor for coronary artery disease, while elevated LDL cholesterol accelerates plaque formation in blood vessels. Gender-based differences in lipid profile observed in the study may be associated with hormonal variations, dietary patterns, obesity prevalence, and lifestyle-related behaviours.<sup>9</sup>

Physical inactivity was another important cardiovascular risk factor identified in the present study. Only 36.95% of participants reported engaging in regular physical activity, indicating a predominantly sedentary lifestyle among the study population. Sedentary behaviour has become increasingly common due to urbanization, technological advancement, and occupational changes. Reduced physical activity contributes to obesity, diabetes mellitus, hypertension, and dyslipidemia, thereby increasing the overall risk of cardiovascular disease.<sup>10</sup> Previous studies conducted in India have similarly reported inadequate physical activity among adults attending health screening programs.<sup>11</sup> Promotion of regular exercise and lifestyle modification is therefore essential for cardiovascular risk reduction.

Socioeconomic status also showed a significant association with cardiovascular risk factors in the present study. Approximately 91.3% of participants belonged to the upper lower and lower socioeconomic classes according to the modified Kuppaswamy scale. Individuals from lower socioeconomic groups are often exposed to unhealthy dietary practices, stress, limited healthcare access, tobacco use, and lack of awareness regarding preventive healthcare measures.<sup>12</sup> These factors collectively increase susceptibility to cardiovascular diseases and associated complications.

Smoking was highly prevalent among male participants, with 32 out of 44 males reporting smoking habits. The majority of smokers belonged to the age group of 50–69 years, followed by the 30–49 years age group. Tobacco smoking is one of the strongest preventable risk factors for cardiovascular

disease and is associated with endothelial dysfunction, increased oxidative stress, thrombosis, and accelerated atherosclerosis.<sup>13</sup> The high prevalence of smoking among middle-aged and elderly males observed in the study is consistent with previous Indian epidemiological studies.<sup>14</sup> Public health interventions focusing on smoking cessation, health education, and behavioural counselling are essential to reduce cardiovascular risk in this population.

Overall, the findings of the present study emphasize the high prevalence of modifiable cardiovascular risk factors among individuals attending routine health check-ups. Early identification and management of obesity, dyslipidemia, smoking, and physical inactivity through regular screening and lifestyle interventions can play a crucial role in preventing cardiovascular diseases and reducing associated morbidity and mortality.

### CONCLUSION

The study revealed a high prevalence of modifiable cardiovascular risk factors including obesity, dyslipidemia, smoking, and physical inactivity, emphasizing the importance of early screening and preventive lifestyle interventions.

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