

## Original Research Article

# Cardiovascular Risk profiling of Adult population attending the Master health check-up clinic in a Tertiary Care Centre, Chennai

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### Abstract:

**Introduction:** Four out of five Cardiovascular death across the world is due to heart attacks and stroke. Non Communicable disease has been increasing globally and in India. It affects younger population and it is twice in India compared to US in age group of 30-59 years. The prevalence of cardiovascular diseases has increased rapidly in India and is higher than Global average (235 per 100000 population).

**Objective:** The objective of the study is to profile the cardiovascular risk among the adult population attending master health check-up clinic in a tertiary care centre.

**Methodology:** A cross sectional study was carried out using the master health check-up records during the period of May to July 2018. Using systematic random sampling, 300 patients were taken as the study population. WHO- ISH risk prediction charts were used to predict the cardiovascular risk.

**Results:** 88.6% of the study participants have a cardiovascular risk of more than 10% while 9.7% have 10-20% risk and 2% have a risk of more than 20% which indicates 10 year fatal or nonfatal risk among them. The major risk factors contributing to this risk such as diabetes and hypertension were significantly more prevalent in Government officials (15.7% and 49.5% respectively) compared to 12.5% and 42.2.% among those in other occupations respectively.

**Conclusions:** The prevalence of Cardiovascular risk like diabetes and hypertension is high among Government officials compared to general population. Obesity, Hypercholesterolaemia, smoking and alcohol intake is more in the general population. More studies have to be done specifically in Government officials alone as they have more risk factors compared to general population..

**Keywords:** Cardiovascular risk, risk prediction, Non-communicable disease

### Introduction:

Infectious diseases have been the leading cause of mortality years ago<sup>1</sup>. But owing to urbanization, increase in life expectancy and adopting harmful lifestyles, Non communicable disease particularly Cardiovascular disease has emerged as the leading cause of morbidity and premature death<sup>2</sup>. Globally Cardiovascular disease are the number one cause of death. It was estimated that around 17.9 million people died due to CVDs in 2016. Three quarters occurs in low income and middle income countries. 82% of premature deaths occurs in low-income and middle income countries of which 37% were due to CVDs<sup>3</sup>. In India Cardiovascular disease burden is expected to double in next to decades projecting it as a single cause of death and second cause of disability by next year 2020<sup>4</sup>.

Cardiovascular disease is multifactorial, so it requires a comprehensive risk assessment for screening purpose. One of the simple and best way of calculating the approximate combined risk considering multiple risk factors is using risk prediction chart. The World Health Organization(WHO) and the International Society of Hypertension formulated this CVS risk prediction chart for the use of different regions of world with the available mortality and risk factor data. Risk stratification approach provides a rational mean for making decisions about intervening at correct time thereby reducing the cardiovascular risk<sup>5,6</sup>.

The present study was conducted to profile the cardiovascular risk among adults attending the Master Health Check-up clinic using WHO/ISH and to find out the risk factors in the study population

### **Materials and Methods:**

A Cross sectional study was carried out from May to July 2018 at Master Health Check-up Clinic in Stanley Medical College. The information was collected by using a pretested questionnaire from adults aged  $\geq 30$  years who had come to attend the Master Health Check-up clinic. Taking the prevalence of moderate to high cardiovascular risk as 17% according to et al study conducted in Puducherry and with absolute precision 5% and at 95% confidence interval, total of 300 participants were recruited using systematic random sampling. Those who had a pre-existing cardiovascular disease was excluded from the study. Anthropometric measurements and laboratory investigations. WHO/International Society of Hypertension(ISH) risk prediction charts for the South-East Asia sub-region D(in setting where blood cholesterol cannot be measured) were used to assess the ten year risk of a fatal or non-fatal cardiovascular event by gender, age, systolic blood pressure, smoking status and presence or absence of diabetes mellitus.

This Chart will estimate the approximate risk in people who do not have established heart disease, stroke and other atherosclerotic plague.

After obtaining permission from institutional ethical committee and individual informed consent from participants, a structured questionnaire contained with basic demographic details like Age, marital status, education, occupation, previous family history of diabetes and hypertension was administered. The body mass index was calculated using Quetlet index. Blood pressure was measured using sphygmomanometer. The statistical package SPSS (version 16) was used for analysis and proportions were calculated for nominal data ,mean and standard deviation were used for continuous data. For categorical variable chi-square test were used for comparing difference of proportion. p value  $<0.05$  was considered as statistically significant

### **Results:**

Table 1 shows the sociodemographic characteristics of the study participants

Among the 300 study participants the mean age of the study population was 44 (9.5) years with minimum age of 30 years and maximum age 75 years and 224(74.7%)were males and 76(25.3%) were females.Nearly half of them were Government Officials 125(41.8%) followed by Executives(28.2%).Majority 285(95%) were married.

Table 2 shows the prevalence of risk factors for CVD according to the Occupation.The prevalence of Hypercholesteremia was 43.6% and 27.3% respectively and was statistically significant ( $p=.004$ ) . Similarly 48.35% among the government officials and 24.2% among the general population reported to have a Family history of Diabetes which is one of the risk factor for CVD.The prevalence of Smoking was found to be significantly higher in Government officials compared to General population.A higher number of government officials were overweight and obese when compared to general population and the difference was statistically significant.

**Table 1. Sociodemographic profile of the study population**

Sociodemographic Characteristic	Study Participants, n(%)
Age, years	
30-44	167(56)
45-59	123(41)
≥60	10(3)
Sex	
Male	224(74.7)
Female	76(25.3)
Occupation	
Executives	85(28.2)
Government Officials	125(41.8)
Clerical, Own Business	44(14.5)
Semi-skilled	26(8.6)
Unemployed	20(6.9)
Marital status	
Single	15(5)
Married	285(95)

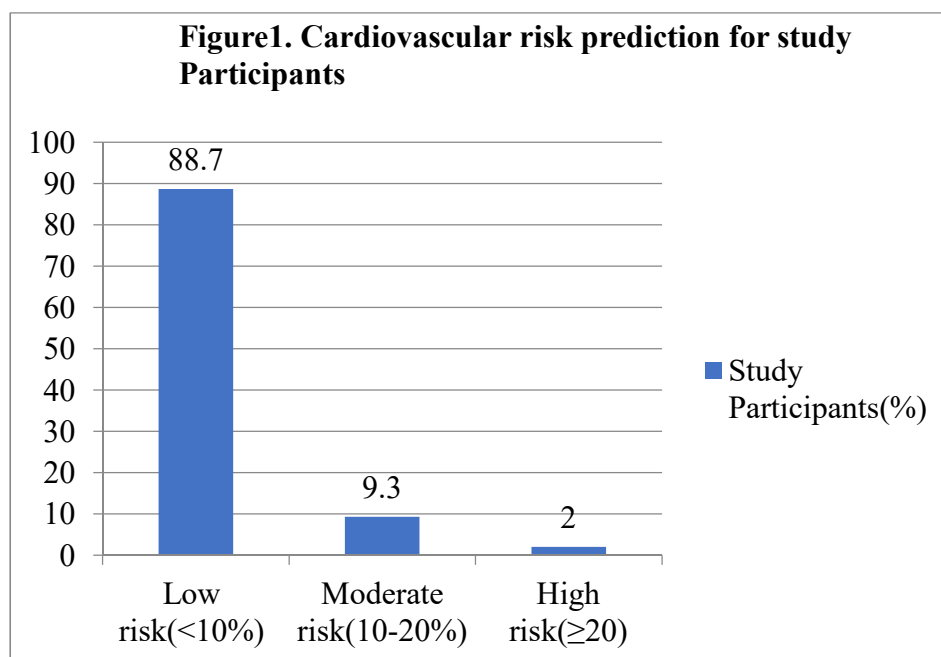
**Table 2. Comparison of Cardiovascular risk factors among Law enforcement and general population**

Cardiovascular risk Factors	Government Officials, n(%)	General population, n(%)	P Value
<b>Hypercholesterolemia</b>	75(43.6)	35(27.3)	.004*
<b>Body mass index</b>			.000***
Normal	30(18.9)	49(34.8)	
Overweight	35(22)	29(20.6)	
Obese	94(59.1)	63(44.7)	
<b>Family history of Diabetes</b>	83(48.35)	31(24.2)	.000***
<b>Alcohol intake</b>	40(23)	19(14.8)	.070
<b>Smoking</b>	31(18)	8(6.2)	.003**
<b>History of stress</b>	80(46.5)	47(36.7)	.90

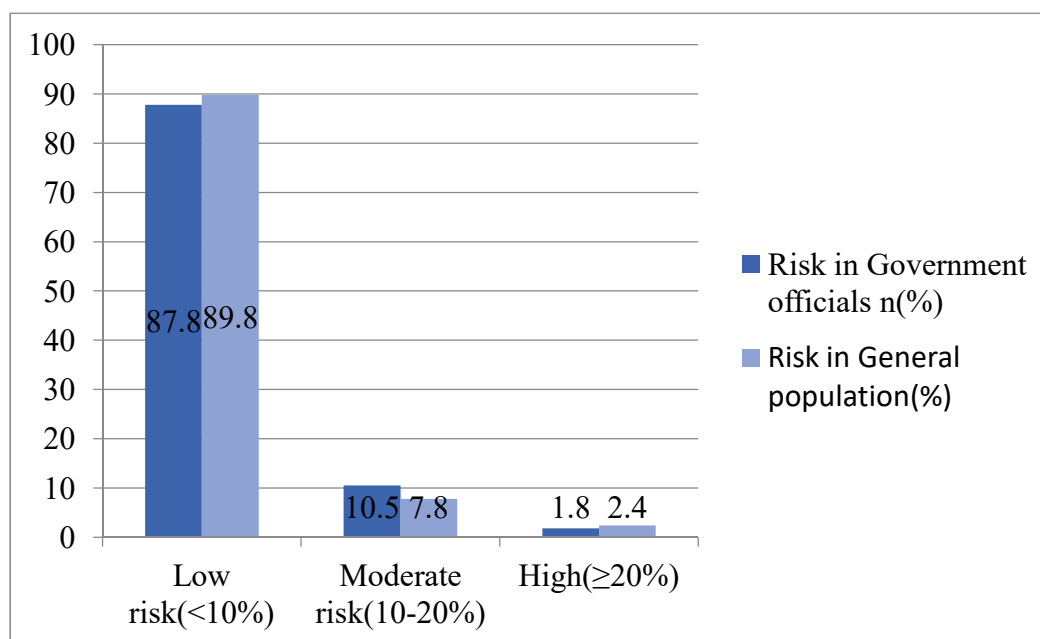
**Table 3 :Prevalence of Cardiovascular risk factors among the study participants(N=300)**

Cardiovascular risk Factors	Government officials,n(%)	General population,n(%)	P Value
Hypercholesterolemia	75(43.6)	35(27.3)	.004*
Body mass index	140(81.4)	75(58.6)	.000***
Family history of Diabetes	83(48.35)	31(24.2)	.000***
Alcohol intake	40(23)	19(14.8)	.070
Smoking	31(18)	8(6.2)	.003**
History of stress	80(46.5)	47(36.7)	.90

**Figure 1:Cardiovascular risk profiling for general population**



**Figure 2. Cardiovascular Risk profiling among Government officials and general population**



**Discussion:**

We conducted based cross sectional study among 300 study participants attending Master Health check-up clinic to study the risk factors and to estimate the 10- year CVD risk among the eligible participants using WHO/ISH risk prediction chart. We found occupational variation in prevalence of various CVD risk factors like hypercholesteremia, obesity to be more in Government officials compared to the General population.

Many individual studies have reported the prevalence of various CVD risk factors in different population groups in our country. Shah and Mathur<sup>7</sup> et al review stated that the prevalence of hypertension among urban areas in India to be 30.2% and 25.7% among males and females respectively which was higher than our study were males 20.9% and females 16%. Sheshatri<sup>8</sup> et al collected data on 12,608 government employees living in different parts of India and found that the prevalence of family history of coronary artery disease was 4.4% and 6% and overweight or obesity was 46.1% and 55.3% in males and females respectively and that difference was statistically significant. In our study the findings were more compared to them and we could not find statistically significant differences between males and females. Similar findings were also noted in Chaitanya<sup>9</sup> et al study conducted in urban health training centre of a tertiary care hospital in Central India .

Bandela et al<sup>10</sup> reported in his study conducted in rural area of Kurnool district of Andhra Pradesh estimated that 0.69% population had >30% risk ,5.48% had 10%-30% risk, and 93.8% had <10% estimated risk. Shrivastava<sup>11</sup> et al in his study conducted in a rural community of puducherry found that 4.9% were having high risk, 9.1% having moderate risk and 86% were having very low risk. Ashwin et al<sup>12</sup> in a study conducted in Group C employees at JIPMER, Puducherry found 0.5% ,1.8%, 1.4% and 96.3% of the participants having very high, high, moderate and low risk respectively. Compared to these studies ,in our study we found a high proportion of individuals at 10-20% 10 year CVD risk. It was also found on our study that government officials have moderate risk 10.5% which is more than general population. Prevention and health promotion as key to

reduce disease burden among the government officials. Health education programs that promote exercise, weight reduction, early diagnosis and screening are some of the key interventions that need to be promoted<sup>13</sup>.

**Conclusion:**

The burden of cardiovascular risk factors like hypercholesteremia, diabetes and hypertension were high among the government officials compared to general population. Risk factors like smoking, alcoholism and obesity should also be need attention in the government officials .This group have moderate(10.5%) risk for developing cardiovascular disease , which over period will shift into severe risk for developing disease which can be prevented by enforcing Work place physical activity in this population.

**Limitations:**

As our study was a hospital-based study conducted in a selective type of population which precludes generalization of our study findings. We could not include some of the other important risk factors in CVD like waist hip circumference.

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**Ethical approval:**

Prior permission was obtained from the Institute of Ethical Committee, Stanley Medical college and the In charge of Master health check-up clinic, Head of the Department,Department of Community Medicine, Stanley Medical College. Informed consent was obtained from each participant

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