Prevalence of risk factors of coronary heart disease among college students in Kanchipuram town

G H Midhun Kumar¹, Kokila Selvaraj², B T Sudhir Ben Nelson³

INTRODUCTION:
Chronic non-communicable diseases (NCD) are assuming increasing importance among adult population in both developed and developing countries. Hence this study was conducted among college going students. OBJECTIVE: To estimate the prevalence of risk factors of coronary heart disease among college students aged 18 to 22 years in Kanchipuram town METHODOLOGY: A cross sectional study was conducted among students aged 18 to 22 years at 4 arts and science colleges in and around Kanchipuram town, a total of 1173 minimum study sample was calculated. RESULTS: All most half of the college students were have risk factor of pre-hypertension (40.9%) & hypertension (8.7%), Nearly half of the college going students were have habitual of consumption of junk food (27.5%), alcohol consumption of about (14.8%), and tobacco smoking (8.4%). one quarter of them were not doing any type of physical activity (24.9%), family history of Coronary heart disease (6.8%), overweight (6.7%), high stress levels (4.4%), and abdominal obesity (3.6%). Common risk factors among males were prehypertension (49.9%), consumption of alcohol (33.4) and physical inactivity (30.1%). The Common risk factors among females were was consumption of junk food (39.4%), prehypertension (33.7%) and physical inactivity (20.7%). CONCLUSION: Unhealthy lifestyle behaviours start at younger age group, catching in younger age group motivating and giving awareness on various risk factors may reduce the risk of people getting Coronary heart disease in future. RECOMMENDATIONS: Students should have continuous reinforcement health educated about the lifestyle diseases and its Preventive measures to Coronary artery disease.

Keywords: Hypertension, Risk factors, coronary artery diseases.

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communicable diseases accounted for 60% of all projected deaths worldwide ie, an estimated 35 million people died of non-communicable disease. Some 80% of the deaths from non-communicable diseases occur in low and middle income countries. The five major non-communicable diseases are heart diseases, stroke, cancer, chronic respiratory disease and diabetes.

Cardiovascular diseases (CVD) comprised of a group of diseases of the heart and vascular system. The major conditions are coronary heart disease (CHD), hypertension, cerebrovascular diseases and congenital heart diseases. It is estimated that there were approximately 29.8 million patients with cardiovascular disease in India during the year 2003. An estimated 1.5 million people die of cardiovascular disease every year. The burden of common cardiovascular diseases was about 2.4 million coronary heart disease and about 0.93 million stroke cases every year. Compared with all other countries India suffers the highest loss in potentially productive years of life due to deaths from cardiovascular disease in people aged 35-64 years. By 2030, the loss is expected to rise to 17.9 million, 9.4 times greater than the loss in USA.

Coronary heart disease, also known as coronary artery disease (or) ischemic heart disease is the leading cause of death globally. It became common in the early decades of the 20th century in high income countries. The epidemic have now spread worldwide. Coronary heart disease is defined as impairment of heart function due to inadequate blood flow to the heart compared to its needs, caused by obstructive changes in the coronary circulation to the heart. Coronary heart disease may manifest itself in many forms like myocardial infarction, angina pectoris, and sudden death. Among them myocardial infarction is specific. With 7.2 million deaths and 12.2% of total deaths, coronary heart disease is a worldwide disease. The highest coronary mortality is seen at present in the European region followed by south East Asia region. Earlier, coronary heart disease has been considered as disease of men. However, currently it is the leading cause of death in both men and women. In India, the pooled estimates from the studies carried out in 1990s up to 2002 shows that prevalence rate of coronary heart disease was high in urban areas (6.4%) when compared to rural areas (2.5%). In that, urban female have high prevalence (6.7%) when compared to urban males (6.1%) and the same in rural areas with females (2.7%) and males (2.1%).

The aetiology of coronary heart disease is multifactorial. Apart from the obvious ones such as increasing age and male sex, studies have identified several important risk factors some of which are modifiable and others are non-modifiable.

Presence of any one of these risk factors places an individual in a high-risk category for developing coronary heart disease. The greater the number of risk factors present, the more likely to develop coronary heart disease. The age presentation of coronary heart disease is being steadily declining these days. Now people who are in the 3rd decade of life itself are undergoing cardiac intervention. The risk of coronary heart disease is 3-4 times higher in Indians than in white Americans, 6 times higher than Chinese and 20 times higher than Japanese. For Indians coronary heart disease occurs 5-10 years earlier than other communities, they also have higher prevalence of type2 diabetes mellitus, abdominal obesity and dyslipidaemia. Most of the studies on risk factors of coronary heart disease are not done in the younger age group and that too few studies are done only in developed countries or in north India that too few decades back. There are poor controls of risk factors during the 2nd and 3rd decade of life which leads to increase chances of coronary heart disease in 4th and 5th decades. So, focusing on this age group will pave a way for planning an early intervention. Taking into consideration these factors, a cross sectional study on prevalence of risk factors of coronary heart disease among arts and science college students of aged 18-22 years in Kanchipuram town was conducted.

MATERIALS AND METHODS

A cross sectional study was conducted during the months of October to December, 201 to know the prevalence of risk factors of coronary heart disease among arts and science college students of four arts and science colleges students aged between 18-22 years in Kanchipuram town, Tamilnadu. Students who are not willing to participate into the study, those known to be on medication for any of the risk factors, and Pregnant students were excluded from the study. A cross sectional study was conducted during the months of October to December, 201 to know the prevalence of risk factors of coronary heart disease among arts and science college students of four arts and science colleges students aged between 18-22 years in Kanchipuram town, Tamilnadu. Students who are not willing to participate into the study, those known to be on medication for any of the risk factors, and Pregnant students were excluded from the study.

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the study. The prevalence of major coronary heart disease risk factor hypertension, 13.6% was reported in a study conducted among students of a medical college in Belgaum, Karnataka in 2012. Sample size was calculated by using the formula

\[
n = \frac{Z^2 \times \pi \times (1-\pi)}{d^2}
\]

We have estimated 10% nonresponsive so we have taken added 10% extra sample to the calculated sample size of 1085 a total of 1195 finally we have taken a round figure of 1200 students this sample was spread over the four colleges according to the strength of students in each college. Simple random sampling was followed to select the samples from each college separately. The samples to be taken from the each college was as follows, the total strength after excluding the 10% of absentees are 2875, 1973, 1464, 1218 students respectively. The proportion of the samples from this total strength is 459, 314, 233 and 194 respectively from each college. Clearance from the Institutional Ethical Committee was obtained. Informed (in Tamil language ) and written explanation (in English language) consent was obtained from each student before the interview (Appendix I). The data collection was done with the help of the post graduates and interns of community medicine after getting orientation about interview schedule. The interview schedule was administered to the subjects by 3 post graduates and the anthropometric measurements and recording of blood pressure was done by interns.

RESULTS

A total of 1173 students were participated in the study. Almost equal representation from both genders was achieved. Females comprised a slightly higher number 652 (55.6%) than males 521 (44.4%). The age of the students were ranging from 18-22 years. The mean age in this study was 19.32 years with the standard deviation of 1.06. Many of the students i.e. 325 (35.3%) belong to the age group of 19 years. This study reveals that majority of the students were having one or more factors which may lead to develop coronary heart disease. The major risk factors in the study was prehypertension with the prevalence of 40.9% followed by consumption of junk food 27.5%, Physical Inactivity 24.9%, Consumption of alcohol 14.8%, Hypertensives 8.7%, Tobacco Smoking 8.4%, Students having Family History of CHD 6.8%, Overweight 6.7%, High Stress levels 4.4%, Abdominal Obesity 3.6% and Obesity 0.9%. The most common risk factors among males in the study were Prehypertension (49.9%), followed by Consumption of alcohol (33.4%) and Physical inactivity (30.1%). The most common risk factors among females in the study were Consumption of junk food (39.4%), Pre hypertension (33.7%) and Physical inactivity (20.7%).

<table>
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<th>Risk Factors</th>
<th>Age in Years</th>
<th>Total</th>
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<tbody>
<tr>
<td></td>
<td>18</td>
<td>19</td>
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<tr>
<td>Smoking</td>
<td>5</td>
<td>19</td>
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<td></td>
<td>1.6%</td>
<td>4.7%</td>
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<tr>
<td>Hypertensive</td>
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<tr>
<td></td>
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<tr>
<td>Obese</td>
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<td>4</td>
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<tr>
<td></td>
<td>0%</td>
<td>1%</td>
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<tr>
<td>No physical activity</td>
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<td>99</td>
</tr>
<tr>
<td></td>
<td>30.4%</td>
<td>24.6%</td>
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<tr>
<td>Abdominal obesity</td>
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<td>11</td>
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<td></td>
<td>2.9%</td>
<td>2.7%</td>
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<tr>
<td>H/o CHD</td>
<td>21</td>
<td>33</td>
</tr>
<tr>
<td></td>
<td>6.8%</td>
<td>8.2%</td>
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<tr>
<td>Fruits consumption</td>
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<td>1.3%</td>
<td>1.7%</td>
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<tr>
<td>Vegetable consumption</td>
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<td>10</td>
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<tr>
<td></td>
<td>3.2%</td>
<td>2.5%</td>
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<tr>
<td>Junk food</td>
<td>87</td>
<td>115</td>
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<td></td>
<td>28.2%</td>
<td>28.5%</td>
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<tr>
<td>Alcohol consumption</td>
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<td>59</td>
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<td>5.5%</td>
<td>14.6%</td>
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<tr>
<td>High alcohol?</td>
<td>20</td>
<td>18</td>
</tr>
<tr>
<td></td>
<td>6.5%</td>
<td>4.5%</td>
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**DISCUSSION**

The objective of the study was to estimate the prevalence of risk factors of coronary heart disease among arts and science college students aged 18-22 years in Kanchipuram town.

**HYPERTENSION** - Analysis of the collected data in the study depicts that 40.9% of the students were pre hypertensive and 8.7% were hypertensive. In a study done in rural Kerala in 1991 in 20 years and above age group it was found that 18% of them were hypertensive. Comparatively in our study the prevalence was less, in another study done among out patients in Lucknow medical college aged 18 years and above said the prevalence of hypertension was 44.6%. In this study it was found that 11.5% males and 6.4% females were hypertensive, and there is significant difference between hypertension and gender.

**TOBACCO SMOKING** - Analysing the data on tobacco smoking 8.4% of the students were current smokers. Among male students 19% of them are reported to be current smokers and among females there was no smokers. As per national family health survey-2 in India said that 29.3% men and 2.3% women were smokers, in another study done in the urban population in Tirupathi reported that 22.7% of males and 0.69% of females at the age group of 20-30 years were smokers, comparing to this study the prevalence is almost similar among males. In our study differences were found to be statistically significant.

**ALCOHOL CONSUMPTION** - Regarding alcohol consumption, 14.8% of the students said that they consume alcohol. In a study in rural Rajasthan, prevalence of alcohol consumption was 12.7%, comparing with our study; the prevalence among rural Kanchipuram students is high. In another study it was reported that in north India the prevalence ranges from 25%-40% and in south India it ranges between 33%-50%. In our study 33.4% of the male students are consuming alcohol and no female students are consuming alcohol. This shows there is a significant difference between alcohol and gender.

**DIETARY HABITS** - The study shows that most of the students are consuming mixed diet (92.5%). Among gender wise 97.1% males consume mixed diet and 88.8% females consume mixed diet. Regarding consumption of fruits it is said that 1.9% of the total students do not consume fruits and 2.9% of males and females 1.1% do not consume fruits, this shows that there is a significant difference among fruits consumption and gender. 3% of the students do not consume vegetables. In that 3.8% of males and 2.3% females do not consume vegetables, this shows that there is significant difference among vegetable consumption and gender. 27.5% of students consume junk food daily, in that more number of female students (39.4%) consumes junk food daily, whereas 12.5% males consume junk food daily. This gives a significant difference between consumption of junk food and gender.
OBESITY- The study reveals that 6.7% of the students are overweight and 0.9% obese, among males 6.1% were overweight and 0.2% were obese and among females 7.2% were overweight and 1.4% were obese. It shows that there is significant difference between BMI and gender. Regarding abdominal obesity 3.6% students have truncal obesity. It reveals that 1% males and 5.7% females have abdominal obesity. A study done in Chennai, shows that the prevalence of abdominal obesity is 31% among adult population\(^{14}\).

PHYSICAL INACTIVITY – In the study 24.9% of the students do not do any physical activity, it reveals that 30.1% males and 20.7% females do not do any physical activity. So there is a significant difference between physical inactivity and gender.

STRESS – The study reveals 4.4% of the students are mentally stress and also shows that 4.4% males and 4.4% females have high stress, moderate stress is more among males (67.9%) compared to females (59.7%), it shows that there is no significance between stress and gender. As per centre for disease control and prevention, the people aged 18-24 years are reported mentally stress with 7.8% males and 12.3% in females\(^{15}\).

The prevalence of Family history of chronic diseases like CHD, Hypertension and Diabetes Mellitus were reported 6.8%.17.1% and 25.1% respectively.

TOTAL RISK FACTORS - Even though students having one risk factor are considered to have risk of developing coronary heart disease, total risk factors with major risk score was added and a risk group was formed. It shows that 2.6% of students are at very high risk of developing CHD, 50.7% are students at high risk and 46.7% students are at risk group. In the difference between risk group and sex distribution, among male students 5.8% of them are at very high risk of developing CHD, 57.4% are at high risk group of developing CHD and 36.9% are at risk group, among females no one are at high risk group, 45.4% are at high risk and 54.6% are at risk group, it tells that there is a significant difference between risk factors and gender.

NUMBER OF RISK FACTORS - The majority of the students are having 2 to 5 risk factors, in which maximum students have 3 and 4 risk factors, seeing on the overall prevalence of risk factors almost everyone(99.98%) are having one or more risk factors, exception in only 2 members in a total of 1173 were not having even one risk factors.

RECOMMENDATIONS - In this study group there are 3 major risk factors which may lead to chances of getting coronary heart disease. The prevalence is more in pre hypertension, unhealthy food habits and physical inactivity. Coronary heart disease is primarily a mass disease; the strategy should be based on mass approach focusing on the control of underlying causes in whole population. The following interventions are mainly suggested for students: Students should be motivated upon the importance of balanced diet and advice to consume fruits and vegetables almost every day, advise them to not to have trans fatty acid foods like pizza, burger, carbonated soft drinks, chips etc. Students should be encouraged to take more salads, green leafy vegetables, fresh juices, fresh lime water and for non-vegetarians more of fish and skinned out chicken. To take skimmed milk or curd every day; To have whole grains, wheat roti, whole pulses, partially polished rise; Students should be health educated on smoking and its harms. If the blood pressure decreases by 2-3mmHg it make much difference in reducing the risk of CHD, students should be motivated to have physical activity almost daily or at least 5 days a week. Students should be advised to take reduced salt diet and not to have high intake of alcohol.

CONCLUSION - Unhealthy life style behaviours starts at this age group. By motivating and giving awareness on various risk factors may reduce the risk of people getting coronary heart disease.

LIMITATIONS- As the interview was conducted by the investigator in person, the answers to few sensitive questions like smoking, alcohol use may have resulted in deviation from actual interpretation of the risk status. Few participants invited did not take part in the study. Exclusion of measuring the blood lipid profile and blood glucose level was not possible due to various reasons. The interviewer found it difficult to explain and make the students understand questions related to the stress. Blood pressure measurements obtained on a single occasion only. The relationship between various risk factors described may not be completely true as it
was not based on prospective data. The temporality cannot be established for these relationships.

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REFERENCES