

## ORIGINAL RESEARCH

### **A Cross-sectional study on Coronary risk factors among students of a medical college in Dakshina Kannada District of Karnataka, India**

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#### **ABSTRACT**

**Background:** Cardiovascular Diseases (CVDs) like ischaemic heart disease, cerebrovascular diseases account for 17.7 million deaths and are the leading causes. CVDs occurs in Indians a decade earlier than the western population. Lifestyle-related behavioural risk factors are mainly implicated for the increased burden of CHD, and research related to these risk factors among medical students is essential, considering their role as future healers and role models in public health intervention programs.

**Objective:** Study the prevalence of coronary risk factors among students of a Medical college in Mangalore.

**Methodology:** A cross sectional study was done among M.B.B.S students of a Medical College from November 2017 to March 2018. The study comprised of 500 students. A pre-tested semi structured questionnaire was used for collection of data. Data was collected by interview cum, clinical examination and relevant laboratory investigations. Statistical analysis was performed using SPSS software.

**Results:** Out of 500 subjects 293 were females and 207 were males. 380 (76%) subjects were consuming transfattyacid food items. 150 (30%) subjects had overweight and 40 (8%) subjects had Obesity. 80 (16%) subjects had Truncal obesity, 135 (27%) subjects were consuming alcohol and smoking was seen in 58 (11.6%) subjects. 107 (21.4%) subjects had high cholesterol. 90 (18%) subjects had lack of physical activity, 71 (14.2%) subjects had family history of CHD. 8 (1.6%) subjects had Hypertension and 10 (2%) subjects had impaired fasting blood sugar.

**Conclusion:** Modifiable cardiovascular risk factors are widely prevalent among medical students. Therefore promotion of supportive environment in the medical institutions for strengthening student based approaches and strategic delivery of periodic health education and health status monitoring is essential.

**Keywords:** Cardiovascular, students, M.B.B.S, obesity, Hypertension, Cholesterol.

## **INTRODUCTION**

Cardiovascular Diseases (CVDs) like ischemic heart disease, cerebrovascular diseases account for 17.7 million deaths and are the leading causes.<sup>1</sup> CVDs occurs in Indians a decade earlier than the western population.<sup>2</sup> In the year 2016, CVDs contributed to 28.1% of total deaths and 14.1% of total disability-adjusted life years (DALYs) compared with 15.2% and 6.9%, respectively in 1990 in India.<sup>3</sup> 32 million heart attacks and strokes per year only the tip of the iceberg. Undetected billions are at high cardiovascular risk due to hypertension, diabetes, high lipids, tobacco use, physical inactivity and unhealthy diet.<sup>4</sup> The epidemic of cardiovascular disease in India is advancing rapidly. Overview of population surveys conducted over two decades in India reported 9-fold increase in the Prevalence of Coronary Heart Disease. It has been estimated that there will be doubling of deaths due to cardiovascular disease (CVD) in India by 2015.<sup>5</sup>

Food habits plays a vital role in the general well being of an any individual consuming food which are rich in trans fatty acids like deep fried fast food, cakes, chips, pies, packaged cookies, candy, aerated drinks etc. is a risk factor for coronary vascular disease. Also adapting a lifestyle which includes tobacco and alcohol consumption, lack of physical activity, abnormal weight gains and stress during the younger age leads to increase risk of coronary vascular disease. When the above factors came into play during the younger age group mainly between 15 to 25 years, it increases the risk of coronary vascular disease. This risk factor development is relatively high in student community. This is due to change in lifestyle and adapting to new environment with financial freedom and also peer pressure. Lifestyle-related behavioral risk factors are mainly implicated for the increased burden of CHD, and research related to these risk factors among medical students is essential, considering their role as future physicians and role models in public health intervention programs.

Medical colleges play a vital role in the overall development of a student into a competent doctor who contributes usefully to the society. Health is an important aspect of development of student and education is an important determinant of health. Medical colleges have profound influence on thinking patterns and behaviours of students, their families, and the interventions can reach generations of students.

## **MATERIALS AND METHODS**

A cross sectional study was done among M.B.B.S students of a Medical College from November 2017 to March 2018. Sampling technique : Universal sampling technique.

All the students who were admitted on or after 1/1/2013 at Medical College in mangalore were included in the study. The study comprised of 500 students (207 were males and were 293 females)

## **INCLUSION CRITERIA**

All the students of M.B. B.S. course were included (From Ist M.B. B.S to Internship) for the study.

## **EXCLUSION CRITERIA**

All the students with known history of cardiovascular disease were excluded.

## **1. METHOD OF COLLECTION OF DATA**

Informed written consent was obtained by explaining to the subjects about the method of study, outcome and possible intervention. An assurance to the subject about confidentiality of the subject's data was ensured. A pre-tested semi structured questionnaire was used for collection of data. Data was collected by interview cum, clinical examination and necessary laboratory investigations.

### **METHOD OF STUDY**

Subjects were contacted as per their convenience. The purpose of study, outcome, and possible intervention was explained to each of the subjects and written informed consent was taken from each subject by interview technique.

- General information, Present, Past, Personal & Family History was collected by asking relevant questions.
- Clinical Examination was done in the Out Patient Department of Community Medicine, running at the teaching hospital of the college.

### **A) HEIGHT MEASUREMENT PROTOCOL**

Subjects stands with back against the board (or whatever part of the body touches the board first; may be more than one body part). Body weight is evenly distributed on both feet. Arms hang freely by the sides of the body, palms facing the thighs. Legs are placed together, bringing knees or ankles together. Subjects stands erect, head is up and facing straight ahead. Verify body position front and left. Position head in Frankfort Horizontal Plane. Subjects inhales deeply holding his/her breath without moving head or body. Bring headpiece down onto the upper most point on the head, compress the hair. subjects are told to let breath out. Height is recorded to the nearest 0.1cm.<sup>6</sup>

### **B) BODY WEIGHT MEASUREMENT PROTOCOL**

Turn on the scale to "zero" the scale. Place standard weight on the scale to ensure accuracy of the scale. If scale is accurate, begin assessments. Ask the subjects to remove extra layers of clothing, jewelry, and any items in his/her pockets. Ask the subjects to step on the scale backwards (for confidentiality). Ensure that the body weight is evenly distributed between both feet. Arms hang freely by the sides of the body, palms toward thighs. Head is up and facing straight ahead. Weight is recorded to nearest to 100 gm.<sup>6</sup>

### **C) WAIST CIRCUMFERENCE MEASUREMENT PROTOCOL**

The subject is in a standing position. The examiner stands behind the subject and palpates the hip area for the right iliac crest. The examiner marks a horizontal line at the high point of the iliac crest and then crosses the line to indicate the midaxillary line of the body. The pants and underclothing of the subjects must be lowered slightly for the examiner to palpate directly on the hip area for the iliac crest. The examiner then stands on the subject right side and places the measuring tape around the trunk in a horizontal plane at this level marked on the right side of the trunk. The recorder walks around the subject to make sure that the tape is parallel to the floor and that the tape is snug, but does not compress the skin. The measurement is made at minimal respiration to the nearest 0.1 cm.<sup>7</sup>

### **D) HIP CIRCUMFERENCE MEASUREMENT PROTOCOL**

The subject stands erect with feet together and weight evenly distributed on both feet. The recorder stands in back of the subject and gathers the side seams of the exam pants together above the hips and places the thumb in the fabric to make a fold. The recorder holds the

folded sides of the pants snugly while the examiner squats on the right side of the subject and places the measuring tape around the buttocks. The tape is placed at the maximum extension of the buttocks. The recorder then adjusts the sides of the tape and checks the front and sides so that the plane of the tape is horizontal. The zero end of the tape is held under the measurement value. The tape is held snug but not tight. The examiner takes the measurement from the right side .<sup>7</sup>

### E) BLOOD PRESSURE

Subject should be seated quietly for at least 5 minutes in a chair (rather than on an exam table), with feet on the floor, and arm supported at heart level. Measurement of BP in the standing position is indicated periodically, especially in those at risk for postural hypotension. An appropriate-sized cuff (cuff bladder encircling at least 80 percent of the arm) should be used to ensure accuracy. At least two measurements should be made. SBP is the point at which the first of two or more sounds is heard (phase 1), and DBP is the point before the disappearance of sounds (phase 5) .Blood pressure was measured using a mercury sphygmomanometer and the average of the two readings will be used for the study. Same instrument was used for all the subjects and it was standardized once before every session with standard instruments.<sup>8</sup>

Female subjects were examined in the presence of a female nurse. Subjects were examined in daylight for general physical examination and systemic examination was done thoroughly. Fasting intravenous blood was taken for laboratory investigations using universal safety precautions.

Fasting lipid profile was estimated by using cholesterol oxidase –peroxidase aminophenazone (CHOD –PAP) method and fasting blood sugar was analyzed using glucose oxidase phenol 4 –aminophenazone ( GOD –PAP) method. If fasting blood sugar is more than normal (126mg/dl), then postprandial blood sugar was checked after giving 75grams of glucose at the end of two hours.

Statistical analysis was performed using SPSS software.

### RESULTS AND DISCUSSION

In the present study, the mean age of the study subjects was 21.5 years (SD=2.007) and youngest subject was 17 years, oldest was 26 years. Nearly 10% of study subjects were beyond the age of 24 years. In the study subjects 390(78%) were Hindus followed by Christians 65 (13%), Muslims 45 (9%).

**Table 1: Distribution of Coronary risk factors in the Study Population (n=500)**

Coronary risk factors	Present (%)	Absent (%)
Transfattyacid consumption	380(76)	120 (24)
Overweight/Obesity	150/40 (30/8)	310 (62)
Alcohol consumption	135(27)	365 (73.0)
High total Cholesterol (>_200mg/dl)	107(21.4)	393 (78.6)
Lack of Physical activity	90(18.0)	410 (82)
Truncal Obesity	80(16)	420 (84)
Family history of CHD	71(14.2)	429 (85.8)
Smoking	58 (11.6)	442 (88.4)
Hypertension	8 (1.6)	492 (98.4)
Impaired fasting blood sugar	10 (2)	490 (98)

The table-1 shows that 380 (76%) subjects were consuming transfattyacid and 150 (30%) subjects were overweight. 135 (27%) subjects were consuming alcohol,107(21.4%) subjects

had high cholesterol. Only 8 (1.6%) subjects had Hypertension and 10 (2%) subjects had impaired fasting blood sugar.

**Table 2: Distribution of Smoking in study subjects in relation to Academic year**

Academic year	Number	Smoking	Percentage
1 <sup>st</sup> year	100	3	3
2 <sup>nd</sup> year	117	12	10.25
3 <sup>rd</sup> year	91	13	14.28
4 <sup>th</sup> year	93	16	17.20
Intern	99	14	14.14
Total	500	58	11.6

Chi square=11.531, P<0.021

In the table 2 the prevalence of smoking was high among the 4<sup>th</sup> year 17.20% subjects followed by the 3<sup>rd</sup> year 14.28 subjects. Possibly due to enhanced academic stress. Smoking was low in interns 14.14% possibly due to awareness and lack of stress of exams/academics. This difference in the smoking in relation to academic year was statistically significant.

Rustagi N et al done a study on cardiovascular risk behaviour among students of a Medical College in Delhi in November 2009 to February 2010 the found that use of any form of tobacco was 7%. Use of tobacco was significantly increased with increase in semester of the students. In 1<sup>st</sup> semester 1.2%, 3<sup>rd</sup> semester 11.9%, 5<sup>th</sup> semester 12.6%, 7<sup>th</sup> semester 17.0% and 9<sup>th</sup> semester 31.3%. In this study also smoking of tobacco was increased with increase in the academic year of the subjects.<sup>9</sup>

**Table 3: Distribution of Alcohol consumption in study subjects in relation to Academic year**

Academic year	Number	Alcohol consumption	Percentage
1 <sup>st</sup> year	100	16	16
2 <sup>nd</sup> year	117	19	16.23
3 <sup>rd</sup> year	91	27	29.67
4 <sup>th</sup> year	93	28	30.10
Intern	99	45	45.45
Total	500	135	27

Chi square= 30.904, P<0.0001

The above table 3 shows that alcohol consumption was high among the intern 45.45% followed by 4<sup>th</sup> year 30.10% subjects. The proportion of consumption of alcohol increased with increase in the academic year. This difference was statistically highly significant. In internship subjects gets more occasions for celebration like birthday, completion of posting and engagement of friends etc .They feel this was their last year to be away from home and possibly they want to enjoy the last year with their friends/peer group.

Rustagi N et al done a study on cardiovascular risk behavior among students of a Medical College in Delhi in November 2009 to February 2010 the found that use of Alcohol was 28.8%. Use of alcohol was significantly increased with increase in semester of the students. In 1<sup>st</sup> semester 10.7, 3<sup>rd</sup> semester 16.7%, 5<sup>th</sup> semester 27.6%, 7<sup>th</sup> semester 34.1% and 9<sup>th</sup> semester 56.3%.<sup>9</sup> In this study also alcohol consumption was increased with increase in the academic year of the subjects.

**Table 4: Distribution of the consumption of food containing Transfattyacid (Fast food) in study subjects in relation to Academic year**

Academic year	Number	Transfattyacid consumption	Percentage
1 <sup>st</sup> year	100	66	66
2 <sup>nd</sup> year	117	86	73.50
3 <sup>rd</sup> year	91	68	74.74
4 <sup>th</sup> year	93	70	75.26
Intern	99	77	77.77
Total	500	367	73.4

Chi square= 12.623, P<0.013

The table 4 shows that the consumption of fast food like cakes, deep fried food, chips, containing more transfattyacid is more in the interns 77.77% followed by the 4<sup>th</sup> year subjects 75.26% and least among the 1<sup>st</sup> year subjects 66.0%. This difference in the consumption of transfattyacid in relation to progress in the academic year of the subjects was statistically highly significant. The consumption of transfattyacid is least among 1<sup>st</sup> year subjects due to majority of the students were new to the college and the place and hostel mess food is compulsory for the 1<sup>st</sup> year subjects and as they progress in the college their habit of eating out side hotels, pizza corners, fast food shops increases significantly because they came to know the place very well and friend's circles also increases to go to outside for food.

Rustagi N et al done a study on cardiovascular risk behaviour among students of a Medical College in Delhi in November 2009 to February 2010 the reported that consumption fast food was 32.0%. Consumption fast food was significantly increased with increase in semester of the students. In 1<sup>st</sup> semester 23.8%, 3<sup>rd</sup> semester 26.7%, 5th semester 37.5%, 7<sup>th</sup> semester 37.1% and 9<sup>th</sup> semester 34.9%.<sup>9</sup>

**Table 5: Distribution of lack of Physical Activity in study subjects in relation to Academic year**

Academic year	Number	Sedentary habits	Percentage
1 <sup>st</sup> year	100	8	8
2 <sup>nd</sup> year	117	23	19.65
3 <sup>rd</sup> year	91	13	14.28
4 <sup>th</sup> year	93	34	36.55
Intern	99	12	12.12
Total	500	90	18

Chi square= 31.864, P<0.0001

The table 5 shows that the lack of physical activity was reported in the 18% of subjects. It was more among the 4<sup>th</sup> year subjects 36.55% followed by 2<sup>nd</sup> year subjects 19.65%. This was possibly because of the subjects in 4<sup>th</sup> year and 2<sup>nd</sup> year, found less time for playing games due to academic compulsion. However, 1<sup>st</sup> year fresher's, inspite of academic stress, they may be carrying out physical exercise due to their exposure first to professional college atmosphere.

This difference in the lack of physical activity in the subjects in relation to academic year of the subjects was statistically very highly significant.

Rustagi N et al done a study on cardiovascular risk behavior among students of a Medical College in Delhi in November 2009 to February 2010 the reported that lack physical activity was 42.6%. Lack physical activity was significantly increased with increase in semester of the students. In 1<sup>st</sup> semester 15.5, 3<sup>rd</sup> semester 16.3%, 5th semester 27.3%, 7<sup>th</sup> semester 37.2% and 9<sup>th</sup> semester 31.7% respectively.<sup>9</sup>

**Table 6: Distribution of high total cholesterol in study subjects in relation to Academic year**

Academic year	Number	High cholesterol > 200mg/dl	Percentage
1 <sup>st</sup> year	100	12	12
2 <sup>nd</sup> year	117	23	19.65
3 <sup>rd</sup> year	91	20	21.97
4 <sup>th</sup> year	93	21	22.58
Intern	99	31	31.31
Total	500	107	21.4

Chi square = 12.292, P<0.015

The table 6 shows that the proportion of high cholesterol in the study subjects steadily increases with their progress in the academic year, with highest among the interns 31.31% followed by the 4<sup>th</sup> year subjects 22.58%. This increase in high cholesterol is due to their consumption of transfattyacid, alcohol and lack of physical activity increased with their increase in the academic year. This difference in the proportion was statistically significant.

## CONCLUSION

From the present study the modifiable coronary risk factors are widely seen among medical students which increases with years spent in the medical college. So promotion of periodic health education, regular physical activities like yoga, sports to be inculcated in the curriculum along with health status monitoring will helps us to decrease the modifiable coronary risk factors in our future doctors.

Instead of body building exercise in Gym it is brisk walking /outdoor games involving aerobic, cardio respiratory activity is to be encouraged as medical students are the healers / preachers for the future population.

## LIMITATIONS

Few subjects did not reveal their personal history regarding the alcohol intake and tobacco/ smoking habits.

## FUNDING

No funding sources.

## CONFLICTS OF INTEREST

None declared.

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